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The Harmonic Language of Richard Strauss's First Period Works: A Transformational Approach

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A prolific composer from a young age, Richard Strauss wrote hundreds of works in his first compositional period. Many of these are forgotten, overshadowed by the tone poems composed beginning in 1886 and also by the operas that followed after the turn of the century. Much of the music written near the end of the first period, however, is the work of an accomplished composer, albeit one who has not fully attained his final compositional voice. These works frequently contain passages of intense harmonic experimentation, a characteristic associated with Strauss throughout his career. These passages are frequently non-functional, yet they are incorporated within the harmonic fabric of the work in significant ways. Starting with the Riemannian P, L, and R transformations, this study introduces a system of harmonic transformation applicable to the study of these types of passages in Strauss’s early music.

Chapter 1 introduces the music of Strauss’s first period, placing it within the context of his career. Chapter Two examines triadic transformations in these works and introduces a system of harmonic transformation that includes major, minor, diminished, and augmented triads. Each transformation is assigned a unique transformation name and
a transformation vector, a compact description of the motion of each member of the initial harmony across the transformation. In Chapter Three, this system is expanded to include major, major-minor, minor, half-diminished, and fully-diminished seventh chords. Again, each transformation is assigned a unique name and a unique vector.

Chapter Four introduces cardinality transformations, which allow for movement between triads and seventh chords, again with unique names and vectors for each.

Chapter Five is an analysis of a single song, “Geduld” Op. 10 No. 5, that demonstrates Strauss’s use of these transformations in a work, employing them not only to express the dramatic content of the song, but also integrating them into all compositional levels, from the smallest motive, phrases, and even the tonal structure of the song. Chapter Six summarizes the previous chapters and places this transformational theory within the larger context of tonal harmonic theory, including Shenkerian theory.
The Harmonic Language of Richard Strauss's First Period Works:
A Transformational Approach

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The Harmonic Language of Richard Strauss's First Period Works:
A Transformational Approach

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Chapter One: Background and Methodology

1.1 The Context of Strauss’s Early Works

A prolific composer of music in many different genres, Richard Strauss was an artist of imposing stature whose works remain an important part of the western art music canon. A sampling of the compositions that are commonly viewed as his masterworks, however, yields a historically inaccurate picture: the works that Strauss is known for today and that have been a constant part of the repertoire since their creation are primarily members of two genres, the symphonic tone poem and opera. Whereas many of his compositions, especially lieder and concerti, are highly regarded and still performed, for the most part these are seen as second-tier works that do not rise to the artistic level of the operas and tone poems.

The symphonic tone poem and opera are the two genres in which Strauss primarily, although not exclusively, worked in the years of his compositional maturity; it was by way of the works in these genres, and in particular his operas Salome (Op. 54/TrV 215) and Elektra (Op. 58/TrV 223), that Strauss established himself as a visionary member of the European avant garde.¹ Significantly, however, these works launched

¹ The identification of Strauss’s works by their catalog numbers is complicated by the existence of two different catalogs. The first catalog, Richard Strauss Thematische Verzeichnis, was compiled by Erich Mueller von Asow. In it, each of Strauss’s works are assigned unique numbers. When used, these numbers...
Strauss not to fame, but to notoriety. In other words, the enduring quality of Strauss’s music, at least to modern ears, is not that which made him famous, but that which made him infamous.

Long before Strauss attained this notoriety, he was well known as a composer. For example, on December 5, 1882, Strauss and the violinist Benno Walter, his father’s cousin, premiered the Violin Concerto in D minor (Op. 8); on November 27, 1882 Franz Wüllner and the Dresden Court Orchestra premiered the Serenade in E♭ for Thirteen Wind Instruments (Op. 7/Tr.V 106); on November 28, 1884 Hermann Levi premiered the Concert Overture in C Minor (TrV 125) in Munich; in December 1884 Theodore Thomas premiered the Symphony No. 2 in F Minor (Op. 12/TrV 126) for the New York Philharmonic Society in New York. All of these performances took place when Strauss was between the ages of eighteen and twenty. Undoubtedly, the path to his early fame was made easier due to the fact that he came from a musical family. His father, Franz, was not only a well-known virtuoso and the principal horn player of the Munich Court Opera but also a composer, the conductor of Wilde Gung’l, an amateur orchestra, and a professor at the Munich Akademie der Tonkunst. The elder Strauss’s fame was such that no less a composer than Richard Wagner insisted on employing him as the principal horn

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are preceded by the abbreviation “AV” (Asow Verzeichnis). Franz Trenner, who completed the third edition of Mueller von Asow’s catalog after the author’s death, compiled his own catalog, Richard Strauss Werkverzeichnis. The numbering system in the latter catalog is preceded by the abbreviation “TrV” (Trenner Verzeichnis). Unfortunately, the AV and TrV numbering systems are not the same. Throughout this study, Strauss’s music will be identified by opus numbers when they have been assigned and also with their catalog number from Franz Trenner, Richard Strauss Werkverzeichnis (Wein: Doblinger, 1985) the first time each work is mentioned. For more information see Scott Warfield, review of Richard Strauss Werkverzeichnis, by Franz Trenner, Notes 2nd Ser., Vol. 42, No. 2 (December 1985): 292-3.

A list of Strauss’s first period works is shown in Appendix A and a list of all works cited in this study is shown in Appendix B.


player in his operas in spite of the fact that the musically conservative Franz made no secret of his disdain for Wagner’s music. While Franz disapproved of Wagner the man – calling him a “drunken ruffian” – and objected to Wagner’s music, he was aware of its cultural and historical significance and saw to it that his son also shared in the experience. He allowed Richard to attend performances of Wagner’s music in the standing-room only places that were reserved for the family members of the musicians at the court opera, and he also took his son with him to Bayreuth when he went there to play the principal horn part in the premiere of Parsifal in 1882. It was not by emulating his father’s musical conservatism, however, that the younger Strauss ultimately established his reputation as a composer. Rather, it was the fact that Strauss also came to be seen as the natural heir to the compositional tradition of Wagner, and this perception was due to Strauss’s penchant for harmonic experimentation, even adventurousness, in his early works.

Using a Schenkerian analytical approach as well as established and newly-proposed transformational techniques, this study examines the harmonic language of several of Strauss’s early works, all of which are compositional antecedents to his operas and tone poems. While many of his early compositions are pedestrian student exercises, others reflect the young composer’s burgeoning willingness to experiment with the harmonic resources at his disposal. Furthermore, they were performed not only by many

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4 In fact, when Wagner’s death was announced during a rehearsal of the Munich Court Opera in February 1883, the conductor Hermann Levi asked all the musicians to stand during a moment of silence as a mark of respect; Franz Strauss refused, remaining seated. Willi Schuh, Richard Strauss: A Chronicle of the Early Years 1864-1898 (Cambridge: Cambridge University Press, 1982), 5-6.
important orchestras in the years immediately following their composition, but also by Strauss himself long after they were written.\textsuperscript{8} Finally, although none of these works stretches the harmonic system of the nineteenth century to its limits – or beyond – in the manner of his most notorious works, the operas \textit{Salome} and \textit{Elektra}, they nonetheless lay the groundwork for Strauss’s later, more complex harmonic language.

1.2 The Periodization of Strauss’s Works

Strauss was conscientious in his work routine, a habit that was well established even in his teenage years, as revealed in his somewhat untruthful remark that he was “always fonder of composing than of studying.”\textsuperscript{9} Strauss was wont to portray himself as somewhat lazy and disinterested, when in fact the opposite was true. Indeed, as Charles Youmans has noted,

Whatever airs he put on in public, the closest thing that the private Strauss had to a religion was \textit{Arbeit:} constant labor, not only in musical composition but in his approach to daily life as a mature, \textit{gebildet} human being (skat notwithstanding). That feature of his personality was just as apparent in his early years, when the Mendelssohnian schoolboy distinguished himself both in the classroom and in his already-chosen professional field, as it was in the end, when as an octogenarian he divided his “retirement” between rereading Goethe and producing new masterpieces.\textsuperscript{10}

\textsuperscript{8} Just one of the many examples of this practice is \textit{Wandrers Sturmlied} Op. 14/TrV 131, which Strauss frequently included in his conducting tours of the late 1890s. Willi Schuh, \textit{Richard Strauss: A Chronicle of the Early Years}, trans. Mary Whittall (Cambridge: Cambridge University Press, 1982), 426-7.


Consequently, over the course of his career, Strauss composed hundreds of works. Unlike the ternary periodization – early, middle, late – that is applied to the works of many other composers, Strauss’s compositional output is usually divided into four periods, perhaps due to his nearly eight-decade career.¹¹

The first period begins with his earliest childhood compositions, the first two of which, the *Schneiderpolka* (TrV 1) for piano and the song *Weinachtslied* o.Op./TrV 2, were composed in 1870 when Strauss was five or six years old. The first period ends in 1885 with more mature works such as the Piano Quartet in C Minor (Op. 13/TrV 137) and the Symphony No. 2 in F Minor. During this time, Strauss wrote chamber music, concertos and his two symphonies, primarily in a style that Leon Botstein has characterized as both “neo-Schumanesque” and “neo-Brahmsian.”¹²

Due primarily to his father’s influence, Strauss’s musical education was thorough but conservative. Franz Strauss admired the Classical masters Haydn, Mozart and Beethoven; equally fervent was his disdain for Wagner’s modernism. Franz insured that Richard was trained well, beginning his son’s piano studies with August Tombo at age four-and-a-half, and later with Carl Niest. At age eight Richard began studying the violin with Benno Walter.¹³ He received a thorough grounding in music theory, harmony and instrumentation from Friederich Wilhelm Meyer, a court conductor with whom he

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¹¹ Some authors have divided Strauss’s compositional development even further. Gustav Brecher, for one, divided Strauss’s career into particularly small segments. Writing in 1900, when Strauss was only thirty-six, Brecher identified no fewer than six compositional periods! See Craig DeWilde, “The Compositions of Richard Strauss 1871-1886: The emergence of a ‘mad extremist’.” Ph.D. diss., University of California, Santa Barbara, 1991, 11-13.


studied from 1875 to 1880. Introduction to the music of the Classical masters, of course, came from Franz himself.

Strauss initially accepted his father’s conservatism and even approved of it, at least outwardly. In 1878 he wrote to his childhood friend Ludwig Thuille, stating that he was “quite frightfully bored” during a performance of Wagner’s *Siegfried*. He also criticized Thuille in 1879 for suggesting that a Schumann *adagio* was as beautiful as a Beethoven *adagio*. This conservatism is reflected in the music of the first period, manifesting itself primarily in the formal plan of many of the first period works. However, the common claim that Strauss was utterly disdainful of Wagner’s music during his youth is not accurate; he had always identified its interesting features. Often, these features were harmonic. The eminent pianist and conductor of the Meiningen Orchestra, Hans von Bülow, who was at first unimpressed by Strauss’s music and under whom Strauss would eventually work as assistant conductor in 1885, came to recognize Strauss’s talent, stating that he was “by far the most striking personality since Brahms.” But he also called Strauss “Richard the Third” – because Wagner could have no successor. Not an idle flatterer, Bülow backed up his praise with performances of Strauss’s Symphony No. 2 in F Minor, and the Serenade in E♭ for Thirteen Wind

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16 In the same letter Strauss also states, contradictorily, “beautiful, incredibly beautiful, this wealth of melodies, this dramatic intensity, this fine instrumentation, and it was clever, eminently beautiful!” Michael Kennedy, *Richard Strauss*, 1st American ed., The Master Musicians (Oxford: Oxford University Press, 1996), 3.
18 Charles Youmans, *Richard Strauss’s Orchestral Music and the German Intellectual Tradition*, (Bloomington: Indiana University Press, 2005), 32. In fact, Youmans suggests that Strauss’s apparent dislike of Wagner’s music was in reality a ruse to placate his father and Ludwig Thuille.
Instruments. He also commissioned a work that became the Suite in B♭ for Thirteen Wind Instruments (Op. 4/TrV 132).\(^{19}\)

Brahms himself was familiar with Strauss’s music. In 1884 he was given a copy of the Suite in B♭ for Thirteen Wind Instruments and viewed the work favorably, although he did offer some criticism to the young composer.\(^{20}\) Strauss met Brahms in 1885, during which time the eminent composer offered more favorable remarks about Strauss’s Symphony No. 2 in F Minor. Brahms noted that it was “quite charming” but again offered criticism, suggesting that Strauss would benefit from studying Schubert’s dances to learn how to compose eight-bar melodies. He also cautioned Strauss against “piling up themes” in excessive counterpoint.\(^{21}\)

Writing about his early music from the vantage point of 1892, specifically the years 1872 to 1880, Strauss told Freidrich von Hausegger that he had composed a great deal but “too much and too uncritically.”\(^{22}\) This assessment is unduly harsh, however, as several biographers have noted that the young composer exhibited an almost preternatural maturity. Willi Schuh, for example, states that Strauss’s greatest period of productivity was during the years 1877 to 1878, but by this time he was no longer in his childhood stage of composition; instead he worked with confidence and on his own.\(^{23}\) Charles Youmans has also noted that Strauss was a fully-trained composer at least by 1880, when


\(^{23}\) *Ibid.*
he completed his musical studies with Meyer at age sixteen. After this point, Strauss possessed an extensive knowledge of the standard repertoire and he drew from this repertoire without trepidation or concern for anachronism. It is a tendency that Strauss maintained throughout his career.

Strauss’s inclination to denigrate some of his early compositions is also seen in his withdrawal of his Symphony No. 1 in D Minor (TrV 94) in early 1884. Again, this seems an overreaction by the young composer. He had completed his musical studies before he began composing the symphony, and it was seen as a success at the time of its premiere. Further enhancing the achievement, the premiere did not take place in an unimportant location or as part of an insignificant event. Instead, it was first performed on March 30, 1881 under the baton of Hermann Levi (and with Franz Strauss as principal horn) in a regular subscription concert of the Musical Academy. The large audience was enthusiastically positive, and the program also included works by Brahms, Mozart and Beethoven. The Münchener Neueste Nachrichten reviewed the symphony positively, noting the “significant talent possessed by this still young composer” and the “considerable competence in the treatment of the form as well as remarkable skill in orchestration.”

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and with even greater enthusiasm than the Symphony No. 1 in D Minor, as demonstrated by its premiere in New York by the Philharmonic Society on 13 December 1884. Within a year it would be performed in Cologne under Franz Wüllner, as well as in Munich and Berlin. Again it was praised by the critics, who noted its “wealth of modulation” and “quality of originality.”

The second period extends from approximately 1885 until 1910. The beginning of this period marks Strauss’s conscious turning away from the conservative musical philosophy handed down to him by his father in favor of the Wagnerian principles he would practice for the rest of his life. The greatest influence on Strauss during this time was not Bülow, who had conducted the first performances of both Tristan und Isolde and Die Meistersinger, but Alexander Ritter, a violinist in the Meiningen orchestra and a contemporary of Bülow. It begins with the tone poem Aus Italien (Op. 16/TrV 147) in 1886, and is also the approximate time when Strauss originally conceived of writing his first opera, Guntram (Op. 25/TrV 168). His earliest mention of the opera is in a letter to Hans von Bülow dated August 26, 1887. During the second period, Strauss’s notoriety grew through the favorable reception of his tone poems and his first four operas,

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30 Since it does not directly pertain to this study, the following discussion of the periodization of Strauss’s music is far less detailed than that of the first period.
culminating with the completion of Elektra in 1908. Although he continued to compose songs, his chamber music output dropped off sharply during this time.

The third period is usually said to begin in 1910 with Strauss’s next opera, Der Rosenkavalier (Op. 59/TrV 227). It is also the longest period, extending until 1941. Many critics and scholars, noting the retrospective quality of Der Rosenkavalier when compared to the modernism of Salome and Elektra, have characterized this period as one in which the composer moved away from modernism and toward a style that was more appealing to popular taste. It is as if Strauss brought himself to the threshold of modernism, a point that the composers of the Second Viennese School had not feared to pass, and then turned back. Leon Botstein, on the other hand, points out that while the third period lacks the harmonic innovation that characterizes the second period, there are nonetheless innovations in other areas, most notably the form and dramatic design of the stage works.

The fourth period, sometimes called the Indian summer, begins with Capriccio (Op. 85/TrV 279) in 1941. It encompasses the final eight years of Strauss’s life and includes such works as Vier Letzte Lieder (TrV 296) and Metamorphosen (TrV 290). This final period is often seen as retrospective in some respects, yet it is marked by the undeniable eloquence and mastery of technique that came of Strauss’s long and productive career.

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34 Ibid., 12-13.
1.3 Previous Biographical and Analytical Studies of Strauss’s First Period and the Scope of this Study

With characteristic self-deprecation, Strauss referred to himself as a “first-rate second-class composer.” Norman Del Mar has suggested that this assessment is not entirely incorrect, but only if viewed in light of Strauss’s whole career. That is, the mature works leading up to *Elektra* are of a higher quality; indeed, they are true masterworks, while *Der Rosenkavalier* and the works that follow it are of a lesser rank. Whether this evaluation is accurate is a matter of debate, but the fact that this opinion is widely held likely explains why the music of Strauss’s second period is no stranger to analysis and criticism. The operas and tone poems, especially, have been the subject of countless studies. The music of the first period, however, is less well known, less performed and consequently less studied. Yet while it contains the young Strauss’s earliest and most childlike efforts at composition – efforts that do not merit analytical attention – this period also offers the more mature works of his late teenage years, a time in which his creative powers were blossoming and in which the young composer began taking on larger forms in his chamber music as well as in orchestral genres such as the orchestral overture and the symphony. It is these later works that paved the way for the music of the second period; even if they do not represent Strauss at his zenith they are capable of standing on their own and, as such, are worthy of study.

To date, there has been little analysis of the music of the first period. Many of the works are mentioned in the biographical literature, but only as more or less significant

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milestones in Strauss’s development as a composer. Description and analysis are the exception rather than the norm and what little analysis exists is cursory, at best. This is probably due to the fact that these works are seldom performed or recorded today and are consequently not well known. Additionally, they are understandably eclipsed by the music of the second period and later. One further factor might be the assumption that the first period works are not worthy of study due to Strauss’s young age.

There are few substantive biographical studies devoted to Strauss’s first period. One of the earliest and richest sources about the life of the young Strauss is Max Steinitzer, not only because he was Strauss’s first biographer, but because of his role as Strauss’s childhood friend. The first volume of Norman Del Mar’s monumental three-volume biography covers the years up to and including the composition of Der Rosenkavalier in 1910; it makes mention of several first-period works, although rarely with much accompanying detail. Indeed, so cursory is the treatment of this period that it encompasses only the first thirty-five pages in the more than four hundred-page work. Willi Schuh dedicates an entire volume to the first thirty-four years of Strauss’s life. Although the volume covers the period up to 1898 (well into Strauss’s second compositional period), Schuh acknowledges that the works under discussion are mentioned in the interest of chronology rather than analysis. Many other biographers have also touched upon Strauss’s early years, but never in great detail.

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37 See Max Steinitzer, Richard Strauss (Berlin: Schuster & Loeffler, 1911).
40 This observation is not meant as a criticism; in fact, the lack of bibliographic detail about a composer’s youth is understandable and quite common. Several other important Strauss biographies can be found in the Bibliography.
If biographical studies of Strauss’s early life are rare, analytical studies of Strauss’s first period works are rarer still. From time to time, a first-period work is included in an analytical study, but usually it is presented as an illustration of an analytical concept rather than as the subject of an analysis in its own right. One exception is Craig DeWilde’s study of the works from 1871 to 1886. Importantly, especially in terms of the present study, DeWilde examines the music not in terms of harmonic language but rather in the context of the three people who were the major musical and philosophical influences on Strauss during that time – Franz Strauss, Hans von Bülow and Alexander Ritter.41

Shad Culverwell Bailey compares Strauss’s two earliest works for wind instruments, the Serenade in E♭ and the Suite in B♭ for Thirteen Wind Instruments, composed in 1881 and 1884, with his last two works for winds, Sonatina No. 1 (‘Aus der Werkstatt eines Invaliden’) (TrV 288) and Sonatina No. 2 (‘Fröhliche Werkstatt’) (TrV 291), composed in 1943 and 1945. While Bailey focuses on the harmonic content of these works, the study is primarily a catalog of frequency of the various harmonies (such as major triads, minor triads, major-minor seventh chords, etc.) that appear in each work, although there is also some discussion of the different types of root motion between harmonies, key areas, methods of modulation, and types of cadences, as well as different types of dissonances.42

Unlike his first period orchestral and chamber music, Strauss’s songs have received some analytical attention, perhaps because several of them have remained in the

repertoire up to the present. Barbara Petersen’s study is the first of these. She presents a historical survey of the songs, examining the poetry as well as the declamation and text settings. The conclusion of the study is an analysis of the *Sechs Lieder* (Op. 68/TrV 235), although not in terms of its harmonic language for, as she acknowledges in her prefatory statement, “a truly accurate evaluation of [Strauss’s] harmonic style should not be limited to the *lied.*”

In her study of the songs composed from 1882 to 1892, Miriam Sue Yutzy examines Strauss’s *Acht Gedichte* (Op. 10/TrV 141) and the *Fünf Lieder* (Op. 15/TrV 148), both composed during the first period. The main focus of the study is the different types of text painting in the songs, especially the effects used to enhance the imagery of the text, and the harmonic language is not a primary concern.

It is my hope that this study will dispense with the assumption that the first period works are immature and unworthy of analysis, replacing it instead with the realization that many of them are instead the fully-formed products of a young composer well on his way to prominence and therefore deserving of study in their own right.

1.4 The First Period – Types of Works and General Characteristics

In the first period, Strauss developed the conscientious work habits that would remain with him for the rest of his life. His productivity is reflected in a list of the 146

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44 Ibid., xii. The *Sechs Lieder* is not a first period work.
compositions he is known to have worked on up to 1885. Of these, only fifteen are incomplete, fourteen are known compositions that have been lost, and one, *Der Zweikampf* (TrV 133), is of dubious attribution. The many different genres that are represented here show the young composer’s wide-ranging interests. Indeed, the only major genre that is not represented in the first period is opera, perhaps due to the fact that most operatic composers require the assistance of a skilled librettist.

Overall, the defining characteristic of the first period works is their catholicity. Throughout his career, Strauss was capable of recognizing that which was good or, more importantly, useful, in the works of other composers. He was able to effortlessly absorb these qualities and then incorporate them into his own works. Numerous authors have noticed the influence of other composers, among them especially Beethoven, Schumann and Mendelssohn, in the young Strauss’s music. Indeed, the emulation of past masters is common and even to be expected, but what is remarkable in Strauss’s case is his thorough knowledge and deep understanding of so much music at such a young age.

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46 A complete list of the known first period compositions is shown in Appendix A. The basis for this tally are the works that are designated with their own number in Franz Trenner and E. H. Mueller von Asow. *Richard Strauss: Werkverzeichnis : (TrV)* (Wien: Verlag Dr. Richard Strauss, 1999). Therefore, the total given here includes several multiple-movement works, such as the D Minor Violin Concerto Op. 8/TrV 110 as well as works that are sets, such as the *Fünf kleine Stücke* (TrV 18). Additionally, a few of the individual works in this tally may have been composed after 1885 but have been included here because they are part of a set that was begun in 1885 or earlier. An example of this is the *Sechs Lieder aus “Lotosblätter”* (Op. 19/TrV 152), some of which may have been composed as late as 1888.

47 Strauss’s first operatic attempt, *Guntram*, was one in which he both composed the music and wrote the libretto. Longer even than *Tristan und Isolde*, it was a failure, closing after four performances following its premier in Weimar. There were attempts to revive it in a truncated version in Frankfurt in 1900 and again in 1910 in Prague; Strauss himself even produced a revised and shortened version, which was performed in Weimar in 1940 and in Berlin in 1942. It is rarely performed even today. See Willi Schuh, *Richard Strauss: A Chronicle of the Early Years*, trans. Mary Whittall (Cambridge: Cambridge University Press, 1982), 361-2.


Beginning in the mid-1870s, Strauss wrote eleven works for orchestra without soloist. Among these works are overtures, marches and serenades, as well as his only two symphonies. There are also five orchestral works with soloists. There are two concertos, one for violin, the other for horn, and two slow works, the Romanze for Clarinet and Orchestra (TrV 80) and the Romanze for Cello and Orchestra (TrV 118). Strauss also wrote for large ensembles other than orchestra. For example, there is the Serenade in E♭ for Thirteen Wind Instruments and the Suite in B♭ for Thirteen Wind Instruments. There are four works for unaccompanied chorus, three for chorus with orchestra, and three other choral works that do not belong to either of these two categories.

Along with works for larger ensembles, Strauss composed fifteen instrumental chamber works. There is a complete string quartet as well as two individual movements for string quartet. There are two piano trios and a piano quartet, as well as works for solo instruments such as violin, horn, flute and piano, plus a violin sonata.

There are twenty-nine works for piano, among them several single-movement works such as polkas, waltzes, fugues and various other pieces, as well as several sonatinas and three piano sonatas.

Finally, there are the dozens of songs that Strauss composed between 1870 and 1884. Thirty-two of these stand alone and are not included as part of a larger group. In

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50 There are also four incomplete works for orchestra from this period – two overtures and two andantes.
51 There is also a polonaise, Der Zweikampf, which is of dubious attribution.
52 Festchor mit Klavierbegleitung (TrV 102) for chorus with orchestral accompaniment is lost.
53 There are also five incomplete works for piano and four that are known to be lost.
addition, there are the song sets of Op. 10 and Op. 15, which are comprised of eight and five songs, respectively.\textsuperscript{54}

1.5 Approaches to the Analysis of Late-Romantic Harmony

The music of the late Romantic period can pose significant analytical challenges. The foremost of these challenges is the freer use of the traditional harmonic vocabulary – the four triad types (major, minor, diminished and, less frequently, augmented) and the five seventh-chord types (major, major-minor, minor, half-diminished and diminished) – in ways that do not conform with their traditional use in functional tonality, in spite of the fact that the works are fundamentally tonal. For the purposes of this study, a work is regarded as tonal if it is organized around a single tonic; in other words, it begins and ends in the same key, regardless of the keys that are utilized in between. In functional tonality, the diatonic harmonies within a key are organized hierarchically and harmonic motion is largely goal-directed toward the most important of these, the tonic chord. Chromatic harmonies are used from time to time, but they tend to function within the harmonic syntax either as substitutes for diatonic harmonies, which add momentary color to a passage, or as secondary harmonies, which treat the diatonic harmonies to which they proceed as small-scale tonics. Also, the main key may be displaced, giving way – again, momentarily – to other keys that may or may not be closely related to the home key, but that always ultimately return to it. The analysis of the harmonic language in functional

\textsuperscript{54} In addition to the thirty-two songs mentioned above, there are seven songs that are known to have existed but which are now lost and one song, “\textit{Gute Nacht}” (TrV 10), that is incomplete.
tonality can usually be expressed succinctly and meaningfully with the notational conventions of traditional roman numeral and figured bass analysis.

Even in functional progressions there are certain kinds of passages for which a traditional roman numeral analysis is meaningless. Examples of these are sequences, circle-of-fifth progressions, and linear progressions. In late Romantic music, however, it is common to find passages in which neither functional tonality nor the sequential or linear techniques just mentioned obtain. In these types of passages, the chord-to-chord connections can seem tenuous, at least in terms of harmonic syntax in the home key or even in a subordinate key. Nevertheless, they are tonal in that the sense of “being in a key” is never really lost and also that they eventually lead back to functional passages. In light of the fact that they are still tonal but are not governed by the traditional expectations of functional tonality, these passages are characterized in this study as non-functional.

Since the common technique of Roman numeral analysis is meaningless in a non-functional passage, other methods of dealing with this type of harmonic vocabulary must be employed. In many instances, a Schenkerian perspective is invoked for non-functional passages. This method is appealing and often fruitful, since these passages do exist in a fundamentally tonal context. The Schenkerian approach is illuminating in many ways, often revealing motivic connections that might otherwise be overlooked. In light of its usefulness, this type of analysis is invoked frequently in this study.

At the same time, because Schenker’s analytical method is formulated with the music of the Baroque and especially the Classical masters in mind, the strict application of his method to later tonal music, such as that of the Romantic period, often seems to
gloss over important aspects of the music. Since Schenker’s theory of tonality postulates that a composition is essentially a large-scale expression of the tonic triad, comparatively small-scale foreground events are sometimes seen as unimportant within the theory – momentarily interesting, perhaps, but more for reasons of local color than their actual value in the overall organization of the work. In the context of Schenker’s rigorous application of his analytical method, this view makes perfect sense; it is essential to remember, however, that Schenker seeks to distill the essential framework of every great composition, since he believes that it is upon this framework, which he called the Ursatz, that the great composers create their works. The continual stripping away of the foreground and middleground layers to uncover this core is the means to the discovery of this deep-level structure, but an unintended byproduct of the process is the possibility of a diminished regard for the musical surface.

If Schenker’s theory may be said to be lacking in any way, it is in its examination of chord-to-chord relationships at the foreground; this is the peril that lies at the heart of the Schenkerian approach when it is applied to late Romantic music. In fact, in Schenkerian voice-leading sketches, it is common for non-functional harmonies to be eliminated even at levels that are quite close to the musical surface. This can seem counterintuitive in music by composers such as Strauss, along with Franz Liszt, Richard Wagner, Gustav Mahler and Hugo Wolf, among others, in whose works non-functional passages abound and are which are often charged with substantial motivic or formal importance when they occur. In reality, of course, this is not a fault of the Schenkerian approach (nor is it a fault of the music) and to criticize it in this way is disingenuous, since the analysis of chord-to-chord relationships is not its purpose.
For chord-to-chord relationships within non-functional passages, a neo-Riemannian approach will be used within this study. Although Hugo Riemann was a contemporary of Heinrich Schenker and although he also sought to develop a comprehensive theory of tonal music, his theories regarding harmonic transformation were relatively unknown until recent decades. The renewed interest in his theories and their use as the basis for what has become known as neo-Riemannian theory was sparked by the work of David Lewin in the 1980s and was followed by an onslaught of theoretical development both by Lewin and by many other theorists in the ensuing two decades.\(^55\) Important to this study, therefore, is the fact that neo-Riemannian analytical techniques, unlike Schenkerian analytical techniques, are still quite new. One consequence of this newness is that there is no firmly-established “method” or “technique” that is universally recognized as definitive. Instead, there are several coexisting theories, some of which are applicable only within narrowly defined contexts while others can be utilized more broadly.

At the core of the theory lies the concept of transformation. A transformation may best be understood in relation to its sister concept, operation. Both refer to the mapping of the pitches of one chord onto the pitches of another chord, but with mappings that take place in different ways. In an operation, the pitches of one chord are mapped onto the pitches of another chord by subjecting each pitch of the first chord to an identical process. For example, CM\(^56\) can be mapped onto A♭M via the transposition operation,


\(^{56}\) Within the text of this study, all triads are represented by the pitch of their root written as an uppercase letter plus a sharp or flat as necessary, followed by a symbol to designate their quality. Major, minor, diminished, and augmented triads are shown by the symbols “M,” “m,” “♭,” and “♯,” respectively. For
specifically $T_8$.\textsuperscript{57} Therefore, each pitch in CM is transposed upward by eight half steps. C maps onto $A\flat$; E maps onto C; and G maps onto E♭. The result of this mapping is A♭M. The inversion operation works in much the same way, but with a different result. Starting again with CM, it can be mapped onto a Gm via the inversion operation, specifically $T_2I$.\textsuperscript{58} Here, each pitch of CM is inverted around C, then transposed upward by two half steps. Therefore, C maps onto D; E maps onto B♭; and G maps onto itself.

A harmonic transformation also maps the pitches from one chord onto those of another chord, but without subjecting each pitch in the first chord to an identical process. Instead, pitches are typically viewed as moving the shortest possible distance within pitch space. For example, in the first example above, CM is mapped onto A♭M. It is also possible to view this movement from a transformational perspective, but with different mappings. In this transformation each pitch moves the shortest distance possible, even if that distance is zero half steps. Therefore, C maps onto itself; E maps onto E♭; and G maps onto A♭. Each pitch moves in a different way. One pitch remains stationary, another moves down a half step, while the remaining pitch moves up a half step. The second example above, the mapping of CM onto Gm, is also possible using a transformational approach. Here, C maps onto B♭; E maps onto D; and G maps onto itself. Again, the movement of the pitches from the first chord to the second is not uniform. One pitch remains stationary, and of the other two, one moves down two half steps, while the other moves up two half steps.

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\textsuperscript{57} In this notation, “$T_n$” stands for transposition, where each pitch is transposed n half steps upward (or clockwise in pitch class space).

\textsuperscript{58} In this notation, “$T_nI$” stands for inversion, where each pitch is inverted around C, then transposed n half steps upward (or clockwise in pitch class space).
In the two examples above, it is unclear which of the two perspectives – mapping the pitches of the first chord to those of the second by operation or by transformation – is more appropriate. In the absence of any musical or analytical context both are equally valid. The choice of operational mapping versus transformational mapping represents a judgment that chooses either uniformity of movement within pitch space (operational mapping) or minimal movement within pitch space (transformational mapping) as the paramount concern. In late Romantic music, non-functional progressions tend to feature chord-to-chord movements in which the salient feature is the retention of common tones from one chord to the next. For this reason, a transformational approach will generally be used in this study.

In the two examples of operations given above, the specific names of the operations, $T_8$ and $T_2I$, are given while the names of the transformations are not. This omission is deliberate and illustrates one of the salient features of triadic transformations: the emphasis on common-tone retention in the transformational approach. Triadic transformations typically preserve two common tones of a triad, mapping each one onto itself, while moving the other pitch by either one or two half steps up or down and mapping it onto the pitch to which it moves. Thus, the transformations above are normally represented not as one single transformation that moves two pitches while retaining one common tone but rather as two separate transformations applied in succession, with each transformation moving one pitch while retaining two common tones. In this study, transformations between either two triads or two seventh chords that retain all but one pitch as common tones will be referred to as simple transformations while those in which two (or more) pitches move will be referred to as compound
transformations. As will be shown in Chapter Four, transformations between triads and seventh chords is not as straightforward as the one-to-one mapping of triadic and seventh chord transformations, so the simple and compound designations are altered slightly in regard to this type of transformation.

Another feature of the transformations discussed above is their restriction to major and minor triads. This is primarily a legacy of Riemann’s work, which recognizes only the consonant major and minor triads. Chapter Two introduces Riemann’s triadic transformations, then continues by proposing a new system of triadic transformations that allows movement among all four triad types: major, minor, diminished and augmented. Chapter Three expands the theory to include movement among five types of seventh chords: major seventh, major-minor seventh, minor seventh, half-diminished seventh and fully-diminished seventh. Chapter Four proposes a system of transformation between triads and seventh chords. The system of transformation proposed in Chapters Two through Four is integrated into a framework that assigns unique names to each transformation and also describes the mapping of pitches within pitch space. These chapters include analyses of numerous small- and medium-sized excerpts that illustrate the role of these transformations in Strauss’s first period works. Chapter Five presents a complete analysis of Strauss’s “Geduld” (Op. 10 No. 5/TrV 141 No. 5), in which the transformational system presented in the previous three chapters is integrated within a larger analysis that also incorporates other methods, most notably Schenkerian analysis.
Chapter Two: Triadic Transformations

2.1 Neo-Riemannian Transformation vs. Harmonic Transformation

As a relatively new area of study, there is often debate about what is and is not part of transformational theory. It is sometimes assumed that it has only one aspect, neo-Riemannian theory, which is defined by Edward Gollin as having three characteristic features: first, movements among major and minor triads are seen as transformations, and these transformations are parts of mathematical groups; second, those transformations that maximize voice-leading parsimony are seen as privileged over those transformations that do not; and third, the transformations between triads are represented spatially through the use of formal graphs. This study departs from these three features in several ways. For example, it does not investigate the group properties of the proposed transformations in this chapter (where group properties exist), nor is the theory restricted to the consonant major and minor triads. The theory presented here may therefore be seen as part of a broader harmonic transformational theory rather than as a neo-

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Riemannian theory. In spite of these differences it incorporates parts of neo-Riemannian theory, especially with regard to triads.

As noted by Richard Cohn and others, the theoretical foundation of modern transformational theory was established in the nineteenth century.\(^6^0\) These ideas were reinvigorated in the work of David Lewin beginning in the 1980s and were soon taken up by theorists such as Brian Hyer and Richard Cohn.\(^6^1\) The result of this work was a nascent field in which the number of transformations had been reduced to three: *Parallel, Relative* and *Leittonwechsel*, which are discussed in detail below. Although their utility as analytical constructs is undeniable, these three transformations are applicable only to harmonic motion among the consonant triads. While much of Strauss’s early music features triadic movement in which the majority of triads are major and minor, there are also significant instances of movement between triads that include the dissonant diminished and augmented triads. Accordingly, this chapter presents a system of harmonic transformation that encompasses movement among all triad types.

2.2 Riemannian Transformations

At the end of Chapter One, movement between two triads was demonstrated in both operational and transformational terms. While the specific operations that effected

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the movement between the chords were identified, the specific transformations were not. Furthermore, it was noted that the movement between the two triads in each of the pairs of chords (CM/A♭M and CM/Gm) could not be represented with a single neo-Riemannian transformation, since these transformations always preserve two common tones between triads while the third pitch moves by either half or whole step.\(^6\)

Riemann identified several different transformations, three of which remain in common use today. These three transformations, mentioned above, are *Parallel* (P), *Relative* (R) and *Leittonwechsel* (L), shown in Example 2.1.

![Example 2.1. The neo-Riemannian transformations. *Parallel* (P), *Relative* (R) and *Leittonwechsel* (L).](image)

These transformations have three salient features. First, they have different effects depending on the quality of the triad they act upon. When acting on a major triad, for instance, P maps the root and fifth onto themselves and maps the third onto the pitch a half step lower, thereby transforming a major triad into a minor triad; when acting on a minor triad, the root and fifth are again mapped onto themselves but the third is mapped onto the pitch a half step higher, thereby transforming a minor triad into a major triad. R maps the root and third of a major triad onto themselves and maps the fifth onto the pitch.

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6\(^2\) In neo-Riemannian theory, preference is given to movement over the shortest possible distance. Therefore, movement between two triads that preserves only one common tone would be viewed as a compound of two (or more) transformations. See section 2.6 below.
a whole step higher, transforming a major triad into its relative minor; when acting on a minor triad, the third and fifth are mapped onto themselves while the root is mapped onto the pitch a whole step lower, thus transforming a minor triad into its relative major. L maps the third and fifth of a major triad onto themselves while the root is mapped onto the pitch a half step lower, transforming a major triad into a minor triad with a root a major third higher; when acting on a minor triad it is the root and third that are mapped onto themselves while the fifth is mapped onto the pitch a half step higher, thereby transforming a minor triad into a major triad with a root a major third lower. These mappings are summarized in Table 2.1.

<table>
<thead>
<tr>
<th>Name of transformation</th>
<th>Quality of triad acted upon</th>
<th>Chord members that map onto themselves</th>
<th>Chord member that maps onto different pitch</th>
<th>Movement of mapped pitch (in half steps)</th>
<th>Root movement (in half steps upward)</th>
</tr>
</thead>
<tbody>
<tr>
<td>P major</td>
<td>R, 5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>-1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>P minor</td>
<td>R, 5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>1</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>R major</td>
<td>R, 3&lt;sup&gt;rd&lt;/sup&gt;</td>
<td>5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>2</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>R minor</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;, 5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>R</td>
<td>-2</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>L major</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt;, 5&lt;sup&gt;th&lt;/sup&gt;</td>
<td>R</td>
<td>-1</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>L minor</td>
<td>R, 3&lt;sup&gt;rd&lt;/sup&gt;</td>
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<td>1</td>
<td>8</td>
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</tr>
</tbody>
</table>

Table 2.1. Pitch mappings, pitch movements and root movements of the Riemannian transformations.
The second salient feature of the three Riemannian transformations is that they are their own reciprocals. Applying a transformation to a triad produces a new triad; applying the same transformation to this new triad produces the original triad. For example, applying $L$ to $E\flat M$ results in $Gm$. Applying the $L$ transformation to $Gm$ results in the original triad, $E\flat M$. Written in an algebraic notation, this series of transformations is summarized as follows: $L(E\flat M) = Gm$; $L(Gm) = E\flat M$. The reciprocal quality of each of the transformations is shown by the double arrow in Example 2.1.

The fact that these transformations act differently depending on whether they are applied to major or minor triads can seem somewhat illogical, but this is a result of Riemann’s dualistic view of major and minor triads as mirror images of one another. Dualism recognizes that the major triad is generated by the overtone series, since the first five overtones are all members of a major triad built above the fundamental pitch. Likewise, it postulates that the minor triad is generated by an “undertone” series, which is thought to be an intervallic mirror of the overtone series, but projected downwards instead of upwards. Therefore, the minor triad is generated by the first five undertones below the fundamental pitch.63 This, of course, is asserted in spite of the lack of any evidence of the existence of the undertone series in nature. Nevertheless, Riemann’s adherence to dualism was strict, extending even to the naming of triads. For example, Riemann calls the major triad built on $C$ $CM$, but the minor triad built on $C$ (that is, a minor triad with $C$ as what modern theorists would consider the root) is not $Cm$. In Riemann’s system, $Cm$ is the triad with a major third and perfect fifth below $C$, which is

considered the root. In other words, a minor triad is a major triad that has been inverted around its root. Therefore, for Riemann, Cm is the triad that a modern theorist would identify as Fm.

The difference in the ways that the P, L and R transformations act on major and minor triads is a result of the conceptual difference between Riemann’s dualism and the modern convention of using acoustical roots to name major and minor triads. Riemann considers each transformation as mapping the same two members of the triad onto themselves regardless of whether the triad is major or minor because he views intervals in minor triads as the mirror image of intervals in major triads. While this approach is conceptually elegant, it is cumbersome in light of the firmly established system of naming triads according to their acoustical roots; furthermore, it is rendered unsupportable by the nonexistence of the undertone series.

The final salient feature of the three Riemannian transformations is that they all result in a change of quality of the original triad. Applying any of these transformations to a major triad results in a minor triad; likewise, applying any of them to a minor triad results in a major triad.

In the next section, the P, L and R transformations are incorporated into a system of transformations that encompasses not only major and minor triads, but diminished and augmented triads as well. They are seen as one of four groups, or subsets, of triadic transformations that preserve two common tones while mapping the third pitch onto a

---

65 It is extremely confusing to conceive of these two triads, CM and Fm, using Riemann’s through-the-looking-glass CM/Cm terminology; a more plausible naming convention for a modern theorist is to conceive of these two triads as a CM/C “mirror.”
different pitch. Each of these new subsets share some – but not necessarily all – of the salient features of the Riemannian transformations mentioned above.

2.3 Simple Triadic Transformations

A simple triadic transformation (STT) is a transformation that maps one triad onto another with two pitches mapping onto themselves while the third pitch maps onto a different pitch, usually either a whole or half step higher or lower. It may be noted that this definition is identical to the definition of a transformation implied at the end of Chapter 1. It is presented here in more formal terms in preparation for its corollary term in section 2.6 below. There are four subsets of STTs: Riemannian STTs, diminished STTs, Weitzmann STTs and fully diminished STTs. The first subset, the Riemannian STTs, is composed of the three Riemannian transformations discussed in section 2.2 above. Significantly, this is the only STT subset that is restricted to major and minor triads.

Like many composers of the time, Strauss’s early music features Riemannian STTs. For example, in Largo (TrV 120) for piano, shown in Example 2.2, the movement from the secondary key of C major back to the home key of A minor is achieved via P. In measures 33-35, the first inversion tonic triad CM is transformed to Cm (in root position) before moving to a fully diminished seventh chord that is enharmonically reinterpreted as vii\(^6\)/V in the key of A minor. This eventually leads to the dominant (albeit through an irregular resolution), preparing for the return of the opening material of the piece.
Example 2. Strauss, Largo, mm. 33-39.

In *Albumblatt* (TrV 111), Strauss also uses a Riemannian STT to achieve a modulation, but even more directly. In measures 54-55, shown in Example 2.3, the final tonic harmony of the B section, Dm, moves directly to FM, the tonic harmony of the A section, which initiates the reprise of the A material. While this is an example of chord-to-chord movement via R, this relationship is also expressed between the main and subordinate keys in the work, F major and D minor.
In “Geduld,” L is used not to effect a modulation but instead to prolong the dominant harmony. In measures 13-24, shown in Example 2.4, the perfect authentic cadence in the home key of A♭ major is followed by a movement to a six-measure Cm via L. Rather than a true modulation, this passage merely implies Cm through sheer repetition in the piano accompaniment and also through the contour of the melodic line. The dominant prolongation that follows in measures 21-23 reveals the preceding six
measures to be a prolongation, which is especially evident in the prominence of $E_{\flat}$ and $G$ – the root and third of the dominant triad – in the melodic line in measures 15-20.\textsuperscript{66}

\textsuperscript{66} For a complete analysis of “Geduld,” see Chapter Five.
In addition to the Riemannian STTs, it is also possible to conceive of STTs that incorporate diminished and augmented triads. While these new transformations differ in their inclusion of new types of triads, they are also similar in many ways.

The second STT subset, the diminished STTs, transform major and minor triads into diminished triads, and vice versa. There are four diminished STTs: Leittonwechsel-major (L+), Leittonwechsel-minor (L-), Relativ-major (R+) and Relativ-minor (R-), shown in Example 2.5.

Example 2.5. The diminished STTs. *Leittonwechsel*-major (L+), *Leittonwechsel*-minor (L-), *Relativ*-major (R+) and *Relativ*-minor (R-).

All of the diminished STTs are named according to two criteria: the type of motion undergone by the pitch that moves in the transformation and whether the transformations include a major or minor triad in addition to a diminished triad. In L+ and L-, for example, the transformed pitch moves by half step as it does in L, but the movement is in the opposite direction. In R+ and R-, the transformed pitch moves by whole step as it does in R, but again in the opposite direction. The symbol following the letter is a plus sign (+) if a major triad is transformed into a diminished triad or a diminished triad is transformed into a major triad. Likewise, the symbol following the letter is a minus sign (-) if a minor triad is part of the reciprocal pair.
When acting on a major triad, $L^+$ maps the third and fifth onto themselves and the root is mapped onto the pitch a half step higher, transforming it into a diminished triad with a root that is a half step higher than the original triad. When acting on a diminished triad, $L^+$ again maps the third and fifth onto themselves while the root is mapped onto the pitch a half step lower, resulting in a major triad with a root that is a half step lower than the original triad.

The $L^-$ transformation works in the same way, but on a different member of the triad. When acting on a minor triad, $L^-$ maps the root and third onto themselves; the fifth is mapped onto the pitch a half step lower, resulting in a diminished triad with the same root as the original triad. When acting on a diminished triad, $L^-$ maps the root and third onto themselves and the fifth is mapped onto the pitch a half step higher, resulting in a minor triad, again with the same root as the original triad.

When acting on a major triad, $R^+$ maps the third and fifth onto themselves and the root is mapped onto the pitch a whole step lower, resulting in a diminished triad with a root a major third higher than the original triad. When acting on a diminished triad, $R^+$ maps the root and third onto themselves; the fifth is mapped onto the pitch a whole step higher, resulting in a major triad with a root a minor sixth third higher than the original triad.

Again, $R^-$ works in the same way. When acting on a minor triad, $R^-$ maps the root and third onto themselves; the fifth is mapped onto the pitch a whole step higher, resulting in a diminished triad with a root a major sixth higher than the original triad. When acting on a diminished triad, $R^-$ maps the third and fifth onto themselves; the root
is mapped onto the pitch a whole step lower, resulting in a minor triad with a root a minor third higher than the original triad.

The diminished STTs resemble the Riemannian STTs in that they share the same three salient features. Namely, the transformations behave differently depending on the quality of the triad they act upon; they are their own reciprocals; and they all result in a change of quality. Table 2.2 summarizes the mappings of the diminished STTs.

<table>
<thead>
<tr>
<th>Name of transformation</th>
<th>Quality of triad acted upon</th>
<th>Chord members that map onto themselves (R, 3\textsuperscript{rd}, 5\textsuperscript{th})</th>
<th>Chord member that maps onto different pitch</th>
<th>Movement of mapped pitch (in half steps)</th>
<th>Root movement (in half steps upward)</th>
</tr>
</thead>
<tbody>
<tr>
<td>L+ major</td>
<td>R, 3\textsuperscript{rd}, 5\textsuperscript{th}</td>
<td>R</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>L+ diminished</td>
<td>R, 5\textsuperscript{th}</td>
<td>3\textsuperscript{rd}, 5\textsuperscript{th}</td>
<td>R</td>
<td>-1</td>
<td>11</td>
</tr>
<tr>
<td>L- minor</td>
<td>R, 3\textsuperscript{rd}</td>
<td>5\textsuperscript{th}</td>
<td>R</td>
<td>-1</td>
<td>0</td>
</tr>
<tr>
<td>L- diminished</td>
<td>R, 3\textsuperscript{rd}</td>
<td>5\textsuperscript{th}</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>R+ major</td>
<td>R, 3\textsuperscript{rd}, 5\textsuperscript{th}</td>
<td>R</td>
<td>-2</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>R+ diminished</td>
<td>R, 5\textsuperscript{th}</td>
<td>3\textsuperscript{rd}, 5\textsuperscript{th}</td>
<td>R</td>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>R- minor</td>
<td>R, 3\textsuperscript{rd}</td>
<td>5\textsuperscript{th}</td>
<td>R</td>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>R- diminished</td>
<td>R, 3\textsuperscript{rd}, 5\textsuperscript{th}</td>
<td>R</td>
<td>-2</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Table 2.2. Pitch mappings, pitch movements and root movements of the diminished STTs.

Strauss uses L+ in *Der Fischer* (TrV 48), shown in Example 2.6. This song, set to a text by Goethe, begins in G minor but modulates to the relative major at the beginning of the second stanza in measure 28. Lacking the tonal stability of the first
stanza, the second stanza moves through B♭ major, A♭ major, C minor, E♭ major, and F minor before returning to E♭ major at the end of the stanza.

Example 2.6. Strauss, “Der Fischer,” mm. 30-35.67

67 In the score, the F4 in measure 33 is shown as F♭, making the chord an enharmonic German augmented sixth chord in A♭ major. This is assumed to be a typographical error, since the chord is still spelled with a B rather than C♭ and the bass is D, an unusual bass note for an augmented sixth chord in A♭ minor.
Most of the modulations are conventional, but the movement from B♭ major to A♭ major occurs via L+. B♭M in measure 31 is transformed into B°, which is then intensified in the next measure by the addition of a seventh, A♭. This fully-diminished seventh chord, however, is enharmonically reinterpreted as vii⁰⁷/V in A♭ major and eventually leads to a perfect authentic cadence in that key in measure 35.

A similar transformation is used in the Scherzo (TrV 86), although it connects two functional harmonies rather than serving as a means of modulation. The passage shown in Example 2.7 begins on the tonic in D major and moves to the dominant in measure 75 with C♯ in the soprano. The dominant is then prolonged until measure 80 through a series of functional harmonies that begin a descent in the soprano from C♯ to A, which arrives on the cadential six-four in measure 79. The movement to B is harmonized by vi. Instead of moving to A, however, Bm is transformed via R- into a G♯o, again harmonizing B, which then moves to iv⁶, supporting B♭. After arriving on A in measure 80, an arpeggiation returns the soprano to C♯ supported by V⁷ and the phrase concludes with a perfect authentic cadence in measure 81.
Example 2.7. Strauss, Scherzo, mm. 73-81.

The third STT subgroup, the Weitzmann STTs, transform major or minor triads into augmented triads, and vice versa. There are two of these transformations,
Weitzmann major (W+) and Weitzmann minor (W-), shown in Example 2.8, respectively.

Example 2.8. Weitzmann STTs. Weitzmann major (W+) and Weitzmann minor (W-).

As with the diminished STTs, the use of a plus sign (+) indicates that one of the triads in the transformational pair is major while the other is augmented; the use of a minus sign (-) indicates that one of the triads in the transformational pair is minor while the other is augmented.

Like the Riemannian and diminished STTs, these transformations behave differently depending on the quality of the triad they act upon and they also change the quality of the triad. They differ from these two STT subgroups, however, in that they are not necessarily their own reciprocals. Instead, the Weitzmann STTs are multivalent when applied to augmented triads. That is, the same transformation can lead to different major or minor triads. This facet of the Weitzmann STTs is explored below.

When applied to a major triad, W+ maps the root and third onto themselves and the fifth is mapped onto the pitch a half step higher, resulting in an augmented triad that
appears to have same root as the original triad. While this augmented triad may have the same root, this is merely a result of nomenclature. Because the augmented triad divides the octave into three equal parts it has no true acoustical root; each of its members may serve as an apparent root. Therefore, the application of $W^+$ to a major triad may result in any one of three enharmonically equivalent augmented triads. This possibility, when applied to a C major triad, is summarized below.

\[
W^+(CM) = C^+;
W^+(CM) = E^+;
W^+(CM) = A\flat^+;
C^+ = E^+ = A\flat^+
\]

The $C^+$, $E^+$ and $A\flat^+$ that could result from the $W^+$ transformation applied to CM are the result of enharmonic choices of spelling. They are equivalent in their pitch class content and this seeming difference is not an example of the multivalence of the Weitzmann STTs. Rather, multivalence is apparent when $W^+$ is applied to an augmented triad. Because it divides the octave into three equal parts, mapping any one member of the augmented triad to the pitch a half step lower while mapping the other pitches onto themselves results in a major triad. Therefore, when $W^+$ is applied to an augmented triad, any two pitches are mapped onto themselves; the remaining pitch is mapped onto the pitch a half step lower, resulting in one of three different major triads, none of which are enharmonically equivalent to another. This possibility, applied to $C^+$, is summarized below.
\[ W^+(C+) = CM; \]
\[ W^+(C+) = EM; \]
\[ W^+(C+) = A♭M; \]
\[ CM \neq EM \neq A♭M \]

The \( W^- \) transformation differs from \( W^+ \) only in its details. When applied to a minor triad, \( W^- \) maps the third and fifth onto themselves while the root is mapped onto the pitch a half step lower, resulting in an augmented triad with a root a half step lower than the original triad. Again, this augmented triad may be spelled enharmonically, but the pitch class content of each spelling is the same. This possibility, applied to \( Cm \), is shown below.

\[ W^-(Cm) = E♭+; \]
\[ W^-(Cm) = G+; \]
\[ W^-(Cm) = B+; \]
\[ E♭+ = G+ = B+ \]

When applied to an augmented triad, \( W^- \) is also multivalent. Any two members of the triad are mapped onto themselves and the third member is mapped onto the pitch a half step higher, resulting one of three different minor triads, none of which are enharmonically equivalent to another. This possibility, applied to \( C+ \), is summarized below.
\[ W-(C+) = Cm; \]
\[ W-(C+) = Em; \]
\[ W-(C+) = A♭m; \]

\[ Cm \neq Em \neq A♭m \]

Table 2.3 summarizes the mappings of the Weitzmann STTs.

<table>
<thead>
<tr>
<th>Name of transformation</th>
<th>Quality of transformation</th>
<th>Chord members that map onto themselves ((R, 3^{rd}, 5^{th}))</th>
<th>Chord member that maps onto different pitch</th>
<th>Movement of mapped pitch (in half steps)</th>
<th>Root movement (in half steps upward)</th>
</tr>
</thead>
<tbody>
<tr>
<td>( W^+ )</td>
<td>major</td>
<td>( R, 3^{rd})</td>
<td>( 5^{th})</td>
<td>1</td>
<td>0, 4 or 8</td>
</tr>
<tr>
<td>( W^+ )</td>
<td>augmented</td>
<td>any two</td>
<td>( R, 3^{rd}) or ( 5^{th})</td>
<td>-1</td>
<td>0, 4 or 8</td>
</tr>
<tr>
<td>( W^- )</td>
<td>minor</td>
<td>( 3^{rd}, 5^{th})</td>
<td>( R)</td>
<td>-1</td>
<td>3, 7 or 11</td>
</tr>
<tr>
<td>( W^- )</td>
<td>augmented</td>
<td>any two</td>
<td>( R, 3^{rd}) or ( 5^{th})</td>
<td>1</td>
<td>3, 7 or 11</td>
</tr>
</tbody>
</table>

Table 2.3. Pitch mappings, pitch movements and root movements of the Weitzmann STTs.

Strauss uses \( W^- \) and \( W^+ \) in the opening measures of *Wandrers Sturmlied* (Op. 14, TrV 131), shown in Example 2.9. Here, the tonic Dm moves to a first inversion \( D♭^+ \) via \( W^- \) and then proceeds to a first inversion FM via \( W^+ \). Combined, the two Weitzmann STTs form a large scale R between the first and third triads.

In measures 24-27 of *Stiller Waldespfad* (TrV 121), shown in Example 2.10, Strauss uses $W^+$ to achieve a modulation from G major to B♭ major. In measure 24 the harmony alternates between the tonic and dominant triads of G major, although the dominant lacks the leading tone. In measure 25, the missing leading tone is supplied in what appears to be a first inversion augmented dominant, but instead of resolving upwards to the expected tonic pitch it moves downward a half step to a second inversion B♭M that functions as a cadential six-four in the key of B♭ major and ultimately leads to a perfect authentic cadence in that key.
Example 2.10. Strauss, *Stiller Waldespfad*, mm. 24-27.

The final STT subset, the fully diminished STTs, transform a diminished triad into another diminished triad. They are called fully diminished STTs because the starting and ending triads of a transformational pair, when taken together, contain all of the pitches of a fully diminished seventh chord. They differ substantially from the other three STT subsets in three ways. First, they do not result in a change of quality between the starting and ending triad. Second, two of the transformations are not their own reciprocals. Third, they are the only STTs that map pitches onto other pitches that are more than two half steps away.

The first fully diminished STT, D1, maps the root and third of a diminished triad onto themselves while mapping the fifth onto the pitch an augmented second higher,
resulting in a diminished triad with a root a minor third lower than the original triad. The second fully diminished STT, D2, maps the third and fifth of a diminished triad onto themselves while mapping the root onto the pitch an augmented second lower, resulting in a diminished triad with a root a minor third higher than the original triad. Both of these STTs are shown in Example 2.11 along with D3, which will be discussed below.

![Example 2.11](image)

Example 2.11. The fully diminished STTs D1, D2 and D3.

As alluded to above, D1 and D2 are not their own reciprocals. However, when applied four times in succession, they eventually return to the enharmonic equivalent of the original triad. This is the result of the fact that the octave is evenly divided by minor thirds, the only third found in the diminished triad. This property is summarized below.

\[
\begin{align*}
D1(C^0) &= A^0; \\
D1(A^0) &= F^#; \\
D1(F^#) &= D^#; \\
D1(D^#) &= B^#; \\
B^# &= C^0
\end{align*}
\]
The same result obtains from four successive applications of D2, but the roots of the triads rise by minor third. Additionally, the triads are all enharmonically equivalent to the triads shown in the successive applications of D1 above.

\[
\begin{align*}
D2(C^\circ) &= E^b; \\
D2(E^b) &= G^b; \\
D2(G^b) &= B^b^\flat; \\
D2(B^b^\flat) &= D^b^\flat; \\
D^b^\flat &= C^\circ
\end{align*}
\]

While D1 and D2 both require four successive applications in order to return to the starting triad and are therefore not their own reciprocals, they are reciprocals of each other. That is, D1 followed by D2, or vice versa, results in the starting triad, as shown below.

\[
\begin{align*}
D1(C^\circ) &= A^\circ; \\
D2(A^\circ) &= C^\circ
\end{align*}
\]

The successive applications of D1 and D2 illustrate the suitability of calling the members of this subset the fully diminished STTs: each diminished triad produced through successive applications of either D1 or D2 is a subset of the same fully diminished seventh chord, although some of the pitches are spelled enharmonically.

The third member of the fully diminished STTs is D3, shown in Example 2.11 above, which maps the root and fifth of a diminished triad onto themselves while
mapping the third onto a pitch a tritone higher, resulting in a diminished triad with a root a tritone higher than the original triad. Unlike D1 and D2, D3 is its own reciprocal, since two successive applications of this transformation result in the original triad.

Furthermore, D3 is equivalent to two successive applications of D1 or D2, as shown below.

\[
\begin{align*}
D3(C^o) &= Gb^o; \\
D1(C^o) &= A^o; \\
D1(A^o) &= F#^o; \\
Gb^o &= F#^o \\
\end{align*}
\]

\[
\begin{align*}
D3(C^o) &= Gb^o; \\
D2(C^o) &= Eb^o; \\
D2(Eb^o) &= Gb^o; \\
Gb^o &= F#^o \\
\end{align*}
\]

Finally, although the fully diminished STTs differ substantially from the other three STT subsets, they are also the least common. In fact, no meaningful examples of these transformations have been found in the literature for inclusion in this study.\(^{68}\) They are included here for the sake of theoretical completeness rather than for their practical use in analysis.

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\(^{68}\) Most instances of two diminished triads with roots separated by minor third are in fact arpeggiations of a true fully diminished seventh chord rather than triads in their own right, suggesting that a transformational analysis is inappropriate.
2.4 Transformation Vectors

While the STTs discussed above are useful descriptors of the various ways in which one triad can be transformed into another with a single pitch mapping onto a different pitch, they are less useful in revealing the actual mappings that take place between the two triads. This information is conveyed in a transformation vector, in which the mappings of the members of a triad are shown in half steps. The pitch movement that takes place in the transformation is represented by a numeral. Self mapping (no movement) is indicated by the numeral 0, half step mapping is indicated by the numeral 1, whole step mapping is indicated by the numeral 2, and so on. Downward motion is indicated by the presence of a minus sign before a numeral; numerals without a minus sign denote upward motion. For STTs that act upon major, minor or diminished triads, the complete summary of the mappings is shown in square brackets, with the mappings of the root, third and fifth of a triad listed in order from left to right. The notation of the Weitzmann STT subgroup is somewhat problematic and is discussed below. Finally, to show that the numerals within the brackets are a transformation vector, the abbreviation “V_t” precedes the opening bracket. The transformation vector for P acting on a major triad, therefore, is V_t[0, -1, 0], while the transformation vector for P acting on a minor triad is V_t[0, 1, 0].

Because STTs are by definition transformations in which two pitches are mapped onto themselves, all of their resulting transformation vectors have two zero values. Furthermore, the nonzero value in the transformation vector for each of the three transformations in the Riemannian STT subgroup and each of the four transformations in the diminished STT subgroup is 1, -1, 2 or -2, since the mappings in these
transformations only include movement by half step or whole step. The nonzero value in the transformation vector for each of the two transformations in the Weitzmann STT subgroup is 1 or -1, since half-step motion up from any member of an augmented triad produces a minor triad and half step motion down from any member of an augmented triad produces a major triad. The nonzero value in the transformation vector for D1 and D2 in the fully diminished STT subgroup, on the other hand, is 3 or -3, since the mappings in these transformations are either up or down an augmented second. The nonzero value in the transformation vector of D3 is always 6.69

Because augmented triads have no acoustical root, the transformation vectors of the Weitzmann STT subgroup are treated differently than the other three STT subgroups. Consider Example 2.12:

Example 2.12. Enharmonically equivalent augmented triads moving to the same D minor triad. a. F+ to Dm; b. A+ to Dm; c. C#+ to Dm.

In Example 2.12a, F+ moves to a first-inversion Dm. In Example 2.12b, F+ is spelled enharmonically as a second-inversion A+ and moves to the same first-inversion Dm. In Example 2.12c, the augmented triad is again respelled enharmonically, this time as a first-inversion C#+. Because of their enharmonic equivalence, each example

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69 Obviously, the nonzero value could also be -6, but in the interest of concision the positive value is preferred.
produces an identical aural effect. Likewise, the same transformation, W-, acts on the augmented triad regardless of its spelling, thereby transforming it into a first-inversion Dm. If the criteria described at the beginning of this section are followed, however, the transformation vectors differ for each example. The transformation vectors of Example 12a, 12b and 12c would be \( V_t[0, 0, 1] \), \( V_t[0, 1, 0] \) and \( V_t[1, 0, 0] \), respectively. This notational difference, in the absence of an actual aural difference or identifiable root, is meaningless. For this reason, transformation vectors of the Weitzmannn STT subgroup transformations acting upon augmented triads are notated as if the bass note of the augmented triad is the root of the triad, regardless of its actual enharmonic spelling.

Each STT in the Riemannian and diminished STT subgroup has two possible transformation vectors, shown in Tables 2.4 and 2.5. This is due to the fact that every STT in these subgroups is its own reciprocal. Since each STT results in a change of quality, and each STT may apply to either of these two qualities, there are two possible transformation vectors associated with each STT.\(^70\)

\(^70\) The fact that each STT has a different transformation vector depending on the quality of the starting triad also suggests that it may be profitable to abandon a dualistic interpretation entirely, viewing each STT as distinct from its reciprocal form. In other words, \( P \) acting on a major triad, \( V_t[0,-1,0] \), could be considered to be a different transformation than \( P \) acting on a minor triad, \( V_t[0,-1,0] \). This possibility is explored in section 2.6.
| Riemannian STTs | | |
|----------------|------------------|
| STT | Quality of starting triad | Transformation vector |
|-----|-----------------------------|
| P   | major                       | $V_i[0, -1, 0]$      |
| P   | minor                       | $V_i[0, 1, 0]$      |
| L   | major                       | $V_i[-1, 0, 0]$    |
| L   | minor                       | $V_i[0, 0, 1]$      |
| R   | major                       | $V_i[0, 0, 2]$      |
| R   | minor                       | $V_i[-2, 0, 0]$    |

Table 2.4. Transformation vectors of the Riemannian STT subgroup.

| Diminished STTs | | |
|----------------|------------------|
| STT | Quality of starting triad | Transformation vector |
|-----|-----------------------------|
| L+  | major                       | $V_i[1, 0, 0]$      |
| L+  | diminished                  | $V_i[-1, 0, 0]$    |
| L-  | minor                       | $V_i[0, 0, -1]$    |
| L-  | diminished                  | $V_i[0, 0, 1]$      |
| R+  | major                       | $V_i[-2, 0, 1]$    |
| R+  | diminished                  | $V_i[0, 0, 2]$      |
| R-  | minor                       | $V_i[0, 0, 2]$      |
| R-  | diminished                  | $V_i[-2, 0, 0]$    |

Table 2.5. Transformation vectors of the diminished STT subgroup.

Unlike the STT subgroups shown in the preceding two examples, there are four possible transformation vectors for each of the Weitzmann STTs, shown in Table 2.6.
below. This is a result of the multivalence of the augmented triad. When acting on a major or minor triad, the Weitzmann STTs can result in only one augmented triad. Acting on an augmented triad, however, the Weitzmann STTs can result in one of three possible major or minor triads. For example, W+ acting on C+ can result in CM, \( V_t[0, 0, -1] \), AbM, \( V_t[0, -1, 0] \) or EM, \( V_t[-1, 0, 0] \). Likewise, W- acting on a C+ can result in Am, \( V_t[0, 0, 1] \), Fm, \( V_t[0, 1, 0] \), or C#m, \( V_t[1, 0, 0] \).

<table>
<thead>
<tr>
<th>Weitzmann STTs</th>
<th>Quality of starting triad</th>
<th>Transformation vector</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>W+</strong></td>
<td>major</td>
<td>( V_t[0, 0, 1] )</td>
</tr>
</tbody>
</table>
| **W+**          | augmented                 | \( V_t[-1, 0, 0] \)  
|                 |                           | or \( V_t[0, -1, 0] \) 
|                 |                           | or \( V_t[0, 0, -1] \) |
| **W-**          | minor                     | \( V_t[-1, 0, 0] \)  |
| **W-**          | augmented                 | \( V_t[1, 0, 0] \)  
|                 |                           | or \( V_t[0, 1, 0] \) 
|                 |                           | or \( V_t[0, 0, 1] \) |

Table 2.6. Transformation vectors of the Weitzmann STT subgroup.

Finally, each of the fully diminished STTs has only one transformation vector, shown in Table 2.7 below.
### Fully diminished STTs

<table>
<thead>
<tr>
<th>STT</th>
<th>Quality of starting triad</th>
<th>Transformation vector</th>
</tr>
</thead>
<tbody>
<tr>
<td>D1</td>
<td>diminished</td>
<td>( V_1[0, 0, 3] )</td>
</tr>
<tr>
<td>D2</td>
<td>diminished</td>
<td>( V_1[-3, 0, 0] )</td>
</tr>
<tr>
<td>D3</td>
<td>diminished</td>
<td>( V_1[0, 6, 0] )</td>
</tr>
</tbody>
</table>

Table 2.7. Transformation vectors of the fully diminished STT subgroup.

The utility of transformation vectors lies in their ability to reveal the voice leading distance between any two triads in pitch space. In transformational passages such as those found in much of Strauss’s early work, there is often an emphasis on incremental voice leading in which only one pitch moves and all other pitches are retained as common tones, a tendency referred to by Richard Cohn and others as “parsimonious” voice leading.\(^7\) While the emphasis on common tones is ubiquitous in Strauss’s transformational passages, however, an emphasis on exclusively triadic harmony in these passages is not. For this reason, analytical examples of transformation vectors will be presented in conjunction with seventh chords in the next chapter.

---

\(^7\) Richard Cohn, “Neo-Riemannian Operations, Parsimonious Trichords, and their Tonnetz Representations,” *Journal of Music Theory*, Vol. 41 No. 1 (Spring, 1997), 1. Although the term is generally credited to Cohn, he recognizes its use in the theoretical writings of Hostinský as early as 1879 and also its similarity to Schoenberg’s “law of the shortest way.” For more information, see *ibid.*, p. 62, n. 4.
2.5 The STT Tonnetz

Hugo Riemann conceived of the P, L and R transformations within a *Tonnetz*, a graphical representation of the transformational relationships between major and minor triads. This *Tonnetz* is shown in Example 2.13. As Brian Hyer observes, the pitches in this example are conceived as lying at the intersection of two lines. The lines extending diagonally from the lower left to the upper right are made up of a series of pitches separated by major thirds while the lines extending diagonally from the upper left to the lower right are made up of a series of pitches separated by minor thirds. Additionally, there is a third set of unwritten lines that extend horizontally from left to right, intersecting the vertices of the diagonal lines, and which are made up of a series of pitches separated by perfect fifth.\(^{72}\)

---

Example 2.13. Hugo Riemann’s *Tonnetz*.

Because Riemann did not conceive of his *Tonnetz* in equal temperament, it is thought of as a two-dimensional diagram extending infinitely in all directions. Since each of the intersections represents a pitch, triads are represented by the triangles formed by the two sets of diagonal lines and the unwritten set of horizontal lines. The transformations are thought of as a “flip” of a triangle along one of its sides. For example, flipping the CM triangle (in bold, near the center of the diagram) downwards results in Cm via P. Likewise, flipping CM up and to the right results in Em via L and flipping it up and to the left results in Am via R. When applied to minor triads the

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transformations happen in the opposite direction; P is an upward flip, L is a flip down and to the left and R is a flip down and to the right.\footnote{Richard Cohn, “Introduction to Neo-Riemannian Theory: A Survey and a Historical Perspective,” \textit{Journal of Music Theory,} Vol. 42., No. 2, Neo-Riemannian Theory (Autumn, 1998), 172.}

Each triangle is composed of three line segments that represent a perfect fifth, a major third and a minor third. This Tonnetz is therefore limited to major and minor triads, since only these types of triads contain one each of these intervals. However, a Tonnetz that does include all of the STTs is possible if, rather than the pitches of a triad, it is the triads themselves that are represented, as demonstrated in Example 2.14a and 2.14b. Here, major, minor and diminished triads are represented by their roots, shown in square boxes. The triads are arranged horizontally according to their quality, with the roots separated by perfect fifth.\footnote{The choice of perfect fifth is arbitrary and based on making the diagram more readable.} Because each augmented triad is the enharmonic equivalent of two other augmented triads, only one instance of each has been included, and these are named not with traditional pitch names but rather according to the lowest-numbered pitch-class that they contain. Therefore, the augmented triad labeled 0+ is equivalent to C+, E+, and A♭+, as well as all other enharmonically-equivalent augmented triads.
Example 2.14a. The STT Tonnetz.
Example 2.14b. The fully diminished STTs.
In Example 2.14a the lines between the boxes represent the individual transformations. As shown in the example, there are six transformations that can act upon the major triads: P, L, R, L+, R+ and W+. Similarly, there are six transformations that can act upon minor triads: P, L, R, L-, R- and W-. Six transformations, L+, R+, L-, R-, as well as D1, D2 and D3, can act on diminished triads, although D1, D2, and D3 are shown in Example 2.14b due to space constraints in Example 2.14a. Finally, only two transformations, W+ and W-, can act on augmented triads.

Because the triads in the STT Tonnetz are conceived in equal temperament, the diagram does not extend infinitely in all directions. Each of the twelve possible major, minor and diminished triads, as well as the four possible augmented triads, are represented in boxes with thick edges. Those triads depicted in boxes with thin edges are duplications of the triads in the main part of the Tonnetz; they are included for the reader’s convenience.

Although it can be depicted in two dimensions, the STT Tonnetz is a three dimensional construct. The horizontal lines of triad types – major, minor, diminished and augmented – may be wrapped so that the two lines of augmented triads converge, forming a cylinder. The cylinder wraps around onto itself so that the duplicated triads converge, forming a torus. The P, L, R, L-, R- L+, R+, W-, and W+ transformations then stretch between the triads at various angles through the center of the cylinder. Because they do not result in a change of quality, the D1, D2 and D3 transformations do not extend through the cylinder but instead lie along the line of diminished triads, as shown in Example 2.14b.
2.6 Unique Triadic Transformation Names

As noted above, the transformations that are their own reciprocals (the Riemannian, diminished, and Weitzmann STT subgroups) have different transformation vectors depending on the quality of the triad they act upon.\(^1\) This suggests that a different naming convention for these transformations in which transformations with different transformation vectors do not share the same name but are instead assigned unique names may be profitable. This approach, of course, results in a system in which there are twice as many transformations, or at least twice as many names for them; therefore, the naming convention for these transformations is designed with ease of understanding in mind. The unique transformation names are derived from the qualities of the starting and ending triad, separated by the directed interval of the root movement between the starting and ending triad. For example, when acting upon a major triad, R+ has the transformation vector \(V_t[-2, 0, 0]\) but when acting on a diminished triad its transformation vector is \(V_t[0, 0, 2]\). In Example 2.14a \(R^+\) is shown starting on GM, resulting in \(B^9\). The reciprocal operation is shown in Example 2.14b. In 2.14a, the name of the transformation is MJ-4-DM\(^2\), since a major triad is transformed into a diminished triad with a root four semitones higher. In 2.14b, the name of the transformation is DM-8-MJ, since a diminished triad is transformed into a major triad with a root three semitones higher.

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\(^1\) Because two of the fully diminished STTs, D1 and D2, are not their own reciprocals, the fact that they have different transformation vectors is less troubling.

\(^2\) For the triadic unique transformation names, major, minor, diminished, and augmented triads are abbreviated as “MJ,” “MN,” “DM,” and “AU,” respectively.

A complete listing of the unique transformation names is shown in Table 2.8.
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Transformation vector</th>
<th>Starting quality</th>
<th>Root movement</th>
<th>Ending quality</th>
<th>Unique transformation name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
</tr>
<tr>
<td>P</td>
<td>Vₐ₀, -1, 0]</td>
<td>M</td>
<td>0</td>
<td>m</td>
<td>MJ-0-MN</td>
</tr>
<tr>
<td>L</td>
<td>Vₐ₀, 0, 0]</td>
<td>M</td>
<td>4</td>
<td>m</td>
<td>MJ-4-MN</td>
</tr>
<tr>
<td>R</td>
<td>Vₐ₀, 0, 2]</td>
<td>M</td>
<td>9</td>
<td>m</td>
<td>MJ-9-MN</td>
</tr>
<tr>
<td>P</td>
<td>Vₐ₀, 1, 0]</td>
<td>m</td>
<td>0</td>
<td>M</td>
<td>MN-0-MJ</td>
</tr>
<tr>
<td>L</td>
<td>Vₐ₀, 0, 1]</td>
<td>m</td>
<td>8</td>
<td>M</td>
<td>MN-8-MJ</td>
</tr>
<tr>
<td>R</td>
<td>Vₐ[-2, 0, 0]</td>
<td>m</td>
<td>3</td>
<td>M</td>
<td>MN-3-MJ</td>
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</tbody>
</table>

**Riemannian STTs**

**Diminished STTs**

<table>
<thead>
<tr>
<th>L+</th>
<th>Vₐ₀, 0, 0]</th>
<th>M</th>
<th>1</th>
<th>°</th>
<th>MJ-1-DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>R+</td>
<td>Vₐ[-2, 0, 0]</td>
<td>M</td>
<td>4</td>
<td>°</td>
<td>MJ-4-DM</td>
</tr>
<tr>
<td>L-</td>
<td>Vₐ₀, 0, -1]</td>
<td>m</td>
<td>0</td>
<td>°</td>
<td>MN-0-DM</td>
</tr>
<tr>
<td>R-</td>
<td>Vₐ₀, 0, 2]</td>
<td>m</td>
<td>9</td>
<td>°</td>
<td>DM-9-MN</td>
</tr>
<tr>
<td>L+</td>
<td>Vₐ[-1, 0, 0]</td>
<td>°</td>
<td>11</td>
<td>M</td>
<td>DM-11-MJ</td>
</tr>
<tr>
<td>R+</td>
<td>Vₐ₀, 0, 2]</td>
<td>°</td>
<td>8</td>
<td>M</td>
<td>DM-8-MJ</td>
</tr>
<tr>
<td>R-</td>
<td>Vₐ[-2, 0, 0]</td>
<td>°</td>
<td>3</td>
<td>m</td>
<td>DM-3-MN</td>
</tr>
<tr>
<td>L-</td>
<td>Vₐ₀, 0, 1]</td>
<td>°</td>
<td>0</td>
<td>m</td>
<td>DM-0-MN</td>
</tr>
</tbody>
</table>

**Weitzmann STTs**

<table>
<thead>
<tr>
<th>W+</th>
<th>Vₐ₀, 0, 1]</th>
<th>M</th>
<th>0</th>
<th>+</th>
<th>MJ-0-AU</th>
</tr>
</thead>
<tbody>
<tr>
<td>W-</td>
<td>Vₐ[-1, 0, 0]</td>
<td>m</td>
<td>3</td>
<td>+</td>
<td>MN-3-AU</td>
</tr>
<tr>
<td>W+</td>
<td>Vₐ[0, 0, -1]</td>
<td>+</td>
<td>0</td>
<td>M</td>
<td>AU-0-MJ</td>
</tr>
<tr>
<td>W+</td>
<td>Vₐ[0, -1, 0]</td>
<td>+</td>
<td>8</td>
<td>M</td>
<td>AU-8-MJ</td>
</tr>
<tr>
<td>W+</td>
<td>Vₐ[-1, 0, 0]</td>
<td>+</td>
<td>4</td>
<td>M</td>
<td>AU-4-MJ</td>
</tr>
<tr>
<td>W-</td>
<td>Vₐ₀, 0, 1]</td>
<td>+</td>
<td>9</td>
<td>m</td>
<td>AU-9-MN</td>
</tr>
<tr>
<td>W-</td>
<td>Vₐ[0, 1, 0]</td>
<td>+</td>
<td>5</td>
<td>m</td>
<td>AU-5-MN</td>
</tr>
<tr>
<td>W-</td>
<td>Vₐ[1, 0, 0]</td>
<td>+</td>
<td>1</td>
<td>m</td>
<td>AU-1-MN</td>
</tr>
</tbody>
</table>

**Fully diminished STTs**

<table>
<thead>
<tr>
<th>D1</th>
<th>Vₐ₀, 0, 3]</th>
<th>°</th>
<th>9</th>
<th>°</th>
<th>DM-9-DM</th>
</tr>
</thead>
<tbody>
<tr>
<td>D2</td>
<td>Vₐ[-3, 0, 0]</td>
<td>°</td>
<td>3</td>
<td>°</td>
<td>DM-3-DM</td>
</tr>
<tr>
<td>D3</td>
<td>Vₐ₀, 0, 6]</td>
<td>°</td>
<td>6</td>
<td>°</td>
<td>DM-6-DM</td>
</tr>
</tbody>
</table>

Table 2.8. The unique transformation names of the STTs.
2.7 Compound Triadic Transformations

All of the STTs map two pitches of a triad onto themselves while mapping the third pitch onto a different pitch. In many transformational progressions, however, two (or occasionally even three) pitches are mapped onto different pitches. In these types of transformations, the traditional transformational approach is to view the movement between triads as a truncated version of two or more transformations. For instance, the movement between FM and F♯m shown in Example 2.15 could be seen as the result of two different transformations, L+ and L-.

Example 2.15. Theoretical STT motion between FM and F♯m.

While this analysis accurately depicts the theoretical motion from FM to F♯m in the STT Tonnetz shown in Example 2.14, it does not reflect the musical reality of the direct motion between the two triads. Instances such as this one can be viewed as a compound triadic transformation (CTT), in which more than one pitch is mapped onto a different pitch in a single transformation. Unique transformation names can be assigned to each CTT in exactly the same manner as outlined above for the STTs. Likewise, each

---

3 There is another possible path from FM to F♯m through the STT Tonnetz: W+(FM) = C♯+; W-(C♯+) = F♯m.
CTT can be assigned a transformation vector with either one zero value or none at all.\(^4\)

Therefore, the CTT that effects the movement between FM and F♯m in Example 2.8 is MJ-1-MN and its transformation vector is \(V_t[1, 0, 1]\).\(^5\)

---

\(^4\) Because a complete listing of the CTTs contains dozens of unique transformations, it is too cumbersome for presentation here.

Chapter Three: Seventh Chord Transformations

3.1 Seventh Chord Transformations in the Scholarly Literature

The triadic transformations presented in Chapter Two are comprehensive, but transformational passages composed entirely of triads are uncommon in music of the late nineteenth century. Strauss’s early music is no exception; transformational passages usually contain either a mixture of triads and seventh chords or, less frequently, only seventh chords. Unlike triadic transformational theory, however, transformations between seventh chords make up a relatively new area of investigation, and studies that deal with such transformations tend to focus on a specific type of seventh chord or on a specific set-theoretic aspect of seventh chord transformations, such as transformations between seventh chords that are members of the same set class. Four of the earliest studies appeared in a single volume of the Journal of Music Theory in 1998. All four restrict the types of seventh chords examined and focus on transformations between seventh chords that maximize the preservation of common tones. For example, Adrian Childs explores the $P_n$-relation, a descriptive term that expresses the difference between the pitch-class content of two chords in $n$ semitones. The transformations developed by

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81 Adrian P. Childs, “Moving beyond Neo-Riemannian Triads: Exploring a Transformational Model for Seventh Chords,” Journal of Music Theory, Vol. 42, No. 2 (Autumn, 1998): 184. As Childs notes, the $P_n$-relation was developed by Jack Douthett and later used by David Lewin.
Childs are the S and C transforms, all of which act on members of set-class 4-27, the set that contains the major-minor seventh chord as well as its inversion, the half-diminished seventh chord. The S transforms are so named because they describe motion between seventh chords in which two pitch classes are retained and the other two move by half step in similar motion. They are further identified by the use of two subscripts, \( m \) and \( n \), which indicate, respectively, the interval class of the two pitch classes that are held as common tones and the interval class of the two pitch classes that move. The C transforms describe motion between seventh chords in which two pitch classes are retained and the other two move by half step in contrary motion. Like the S transforms, the interval class of the pitch classes that are held as common tones and the interval class of the pitch classes that move are identified by \( m \) and \( n \).\(^{82}\) Since all of the S and C transforms involve half step motion of two pitches, they are all examples of the \( P_2 \)-relation. Furthermore, these two types of transformations differ from each other in that the S transforms are “mode changing” and the C transforms are “mode preserving.” That is, when an S transform is applied to a half-diminished seventh chord, the resulting chord is a major-minor seventh chord, and vice versa. On the other hand, when C transforms are applied to half-diminished seventh chords, the resulting chord is also a half-diminished seventh chord. When C transforms are applied to a major-minor seventh chord, the resulting chord is again a major-minor seventh chord.\(^ {83}\) The nine possible C and S transforms that Childs identifies are shown in Example 3.1, where they act on \( C^7 \) and \( C^\text{o7} \).

\(^{82}\) Ibid., 185.
\(^{83}\) Ibid.
Example 3.1. a. Childs’s S and C transforms, beginning on a C\(^7\); b. Childs’s S and C transforms, beginning on C\(^\#7\). Common tones with the starting chord are indicated with open note heads.

Edward Gollin also studies set class 4-27, which contains the half-diminished and major-minor seventh chords, but with specific focus on the representation of these chords in a three-dimensional Tonnetz. He develops a system of tetrahedra, the axes of which correspond to the various intervals in the chords. He names the axes a, b, and c, with intervals along the a-axis representing a major third, intervals along the b-axis representing a perfect fifth, and intervals along the c-axis representing a minor seventh. The a-, b-, and c-axes form three of the sides of each tetrahedron, with the fourth side
forming the remaining interval, a minor third.\textsuperscript{84} Each upward-pointing tetrahedron represents a major-minor seventh chord while each downward-pointing tetrahedron represents a half-diminished seventh chord. Each tetrahedron shares three pitches with its adjacent tetrahedra. The transformations between the chords represented by the tetrahedra are thus seen as “flips” around their common elements.\textsuperscript{85}

Clifton Callender examines transformations not only between seventh chords, but also sets of higher cardinality than four. Like Childs, much of the focus of Callender’s study centers on the retention of pitch classes between different chords. Specifically, this is expressed in another type of P-relation, where the movement in half steps is shown by a superscript rather than a subscript. For Callender, the P\textsuperscript{1}-relation is preferred, with a single pitch class moving up or down by half step, and a relationship between two chords is only considered to be parsimonious if it involves half-step voice leading.\textsuperscript{86} Since a significant portion of this study is devoted to movement between sets of different cardinalities, Callender proposes a “split-relation,” which will be discussed in Chapter Four.\textsuperscript{87}

Jack Douthett and Peter Steinbach take a different approach. Like Childs and Gollin, their study is restricted to specific types of seventh chords, specifically the major-minor seventh, the minor seventh, and the half-diminished seventh chords. And like both Childs and Callender, they develop another variation of the P-relation, called the relation definition. In this definition, movement between chords is considered to be parsimonious.

\textsuperscript{85} \textit{Ibid.}, 200.
\textsuperscript{87} \textit{Ibid.}, 224.
if only one pitch moves, but the motion may be by half step or whole step; the number of pitches that move by half step and whole step are shown by the subscripts $m$ and $n$, respectively. Therefore, the only parsimonious relation definitions are $P_{0,1}$ and $P_{1,0}$.

The authors develop networks called “mode graphs,” because their vertices represent chords that are part of a mode of limited transposition. Two of the graphs, HexaCycles and OctaCycles, show the parsimonious movement among the consonant triads. The HexaCycles are composed of all of the consonant triads that are members of the same hexatonic set, with cyclic $P_{1,0}$ motion between each pair of triads. The OctaCycles are similar in that they are composed of the consonant triads that are members of the same octatonic set, but different in that the cyclic motion is made up of an alternation between $P_{1,0}$ and $P_{0,1}$. There are also two mode graphs that are composed of seventh chords. The OctaTowers are composed of the major-minor seventh, minor seventh, and half-diminished seventh chords that are members of the same octatonic set, with cyclic $P_{1,0}$ motion between each pair of seventh chords. The EnneaCycles are composed of the major-minor seventh, minor seventh, and half-diminished seventh chords that are members of the same enneatonic set, but with cyclic motion that alternates between $P_{1,0}$ and $P_{0,1}$. These four mode graphs are shown in Example 3.2.

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88 Jack Douthett and Peter Steinbach, “Parsimonious Graphs: A Study in Parsimony, Contextual Transformations, and Modes of Limited Transposition,” *Journal of Music Theory*, Vol. 42, No. 2 (Autumn, 1998): 243-244. Later in the study, Douthett and Steinbach include $P_{2,0}$ as a parsimonious relationship, since the total motion in half steps is two, which is equivalent to $P_{0,1}$.

89 Ibid., 245.

90 Ibid.

91 Ibid.
Example 3.2. Douthett and Steinbach’s mode graphs; a. HexaCycles; b. OctaCycles; c. OctaTowers; d. EnneaCycles. The numbers in the curly braces represent pitch classes present in each mode graph.

Another important feature of Douthett and Steinbach’s study is the introduction of five seventh chord transformations that are modeled after the neo-Riemannian triadic
transformations, and which use P, L, and R as the basis for their naming convention. Again, these transformations act only on major-minor seventh, minor seventh, and half-diminished seventh chords, and all are parsimonious, with either $P_{1,0}$ or $P_{0,1}$ motion. The first transformation, $P_1^*$, exchanges half-diminished and minor seventh chords that have the same root. A similar transformation, $P_2^*$, exchanges minor seventh and major-minor seventh chords that have the same root. The $P^*$ transformations derive their names from the fact that the two chords in each transformational pair share the same root and a member of the chord moves by half step, as in the neo-Riemannian P transformation. In $P_1^*$, the fifth of the half-diminished seventh chord moves up by half step; conversely, the fifth of the minor seventh chord moves down by half step in its reciprocal transformation. In $P_2^*$, the third of the minor seventh chord moves up by half step; conversely, the third of the major-minor seventh chord moves down by half step. Both $P^*$ transformations are shown in Example 3.3.\(^{92}\)

A third transformation, $L_1^*$, exchanges a half-diminished seventh chord with a minor seventh chord that has a root a minor third higher, or a minor seventh chord with a

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\(^{92}\) Ibid., 250.
half-diminished seventh chord that has a root a major sixth higher. The $L_2^*$ transformation exchanges a minor seventh chord with a major-minor seventh chord that has a root a minor third higher or a major-minor seventh chord with a minor seventh chord that has a root a major sixth higher. The $L^*$ transformations derive their names from the fact that the root of the chord moves up by half step or the seventh of the chord moves down by half step, depending on the quality of the starting chord, much as the root or fifth of a consonant triad moves up or down by half step in the neo-Riemannian triadic $L$ transformation, depending on the quality of the triad. They differ in that the direction of the half step motion is opposite. When beginning on a major triad, the $L$ transformation moves the root down by half step; when beginning on a half-diminished seventh chord with $L_1^*$ or a minor seventh chord with $L_2^*$, the root moves up by half step. When beginning on a minor triad, the $L$ transformation moves the fifth up a half step; when beginning on a minor seventh chord with $L_1^*$ or a major-minor seventh chord with $L_2^*$, the seventh moves down by half step. The $L^*$ transformations are shown in Example 3.4.

![Example 3.4. Douthett and Steinbach’s $L_1^*$ and $L_2^*$ transformations.](image)
Douthett and Steinbach’s final transformation, $R^*$, exchanges a major-minor seventh chord for a half-diminished seventh chord that has a root a major third higher or a half-diminished seventh chord with a major-minor seventh chord that has a root a minor sixth higher. This transformation is similar to the $L^*$ transformations in that the root or seventh of the chord moves, depending on the quality of the starting chord, but it derives its name from the fact that this movement is by whole step, similar to the neo-Riemannian $R$ transformation, in which either the root or fifth of the chord moves by whole step, depending on the quality of the chord. The root of a major triad moves up by whole step in the $R$ transformation, the root moves up by whole step when $R^*$ begins on a major-minor seventh chord. Likewise, the fifth of a minor triad moves down by whole step in the $R$ transformation, but the seventh moves down by whole step when $R^*$ begins of a half-diminished seventh chord. Example 3.5 shows the $R^*$ transformation.

Example 3.5. Douthett and Steinbach’s $R^*$ transformation.

3.2 Simple Seventh Chord Transformations

Like the triadic transformations in Chapter Two, seventh chord transformations can be classified as either simple or compound. In a simple seventh chord transformation (SST), three pitches are mapped onto themselves while the fourth pitch is mapped onto a
different pitch and moves by either whole or half step.\footnote{Movement by any interval greater than a whole step cannot produce another seventh chord.} The transformations introduced here are extensions of those proposed by Douthett and Steinbach, but removed from their set-theoretic framework. Furthermore, the types of seventh chords that are parts of the transformations are expanded beyond major-minor seventh, minor seventh and half-diminished seventh chords to include major seventh and fully-diminished seventh chords. They are divided into subgroups based on their properties, and each can be assigned unique transformation names and transformation vectors.\footnote{The abbreviations used in the unique transformation names are as follows: major seventh chord, MJ7; major-minor seventh chord, DM7; minor seventh chord, MN7; half-diminished seventh chord, HD7; fully-diminished seventh chord, FD7.} While not all of these transformations are found in Strauss’s early music, they are included here for the sake of completeness.

The first of these is the Parallel SST subgroup, shown in Example 3.6, along with their unique transformation names and corresponding transformation vectors. This subgroup contains the P_1^* and P_2^* transformations of Douthett and Steinbach, plus one new transformation, P_3^*. All of these transformations begin and end on seventh chords with the same root, with either the third, fifth, or seventh of the chord mapping onto a pitch a half step higher or lower, depending on the starting chord. Like the P transformation in the neo-Riemannian STT subgroup, the transformational pairs in each transformation are one “level” apart from each other, if the different types of seventh chords are ordered in terms of their interval content. In P_1^*, the transformational pair consists of a half-diminished seventh and a minor seventh chord, with the fifth moving either up or down by half step, depending on the starting chord; in P_2^*, the transformational pair consists of a minor seventh and a major-minor seventh, with the
third moving up or down a half step, again, depending on the starting chord. The P₃* transformation is similar. Here, the transformational pair consists of a major-minor seventh and a major seventh, with the seventh moving up or down by half step.

Like triadic transformations, seventh chord transformations also have transformation vectors, and they are similar in their construction to those of the triadic transformations, the only difference being the addition of the seventh. The transformation vectors of the Parallel SST subgroup reflect the half-step motion of the pitch that moves, with all other values listed as zero. And also like the triadic transformations, each transformation can be assigned a unique transformation name that lists the type of the first seventh chord, the directed motion between the roots of the first and second chords, and the type of the second seventh chord. Since the root remains the same in all of the Parallel SSTs, the directed motion of the root shown in the unique transformation names are all zero.

Example 3.6. The Parallel SST subgroup.
Strauss’s use of the Parallel SSTs can be seen in his earliest works. In *Weihnachtsgefühl* (TrV 198), for example, P,* is used, albeit in a tonal context. Shown in Example 3.7, ii⁷ is transformed into its minor mode counterpart, ii⁹, via P,* in the approach to the final cadence, thereby intensifying the feeling of nostalgia depicted throughout the song by the use of harmonies borrowed from the minor mode.
Example 3.7. Strauss, *Weihnachtsgefühl*, mm. 19-25. P$_1^*$ is used to move from ii$_7$ to ii$^{07}$ in m. 20.

The P$_2^*$ transformation is used to achieve a modulation in *Spielmann und Zither* (TrV 58), shown in Example 3.8. In measure 94, the final cadence in D$^b$ major is heard before the return of the home key, F minor. D$^b$M moves to Fm via L, and then to Cm$^{6}$,
which moves directly to $C_{5}^{6}$, the dominant of F minor. This in turn proceeds to Fm to complete the modulation.


The chords in the *Leittonwechsel* SST subgroup also map a pitch onto one a half step away, but with a change of root. This group contains Douthett and Steinbach’s $L_{1}^{*}$.
and $L_2^*$, plus a new transformation, $L_3^*$, shown in Example 3.9, along with their unique transformation names and corresponding transformation vectors. In both $L_1^*$ and $L_2^*$ the root of the first chord in the transformation moves by half step to become the seventh of the second chord. In $L_1^*$ the transformational pair consists of a half-diminished seventh and minor seventh chord, while in $L_2^*$ the chords are a minor seventh and major-minor seventh chord. The transformation vectors for $L_1^*$ and $L_2^*$ are identical, either $V_t[1, 0, 0, 0]$ or $V_t[0, 0, 0, -1]$, depending on the starting chord. Also, the directed motion of the root is either three or nine half steps, depending on the direction of the transformation. In $L_3^*$, however, the situation is slightly different. Here, the transformational pair consists of a half-diminished seventh and a major seventh chord. Since the intervallic structure of the upper three pitches in these two types of seventh chords is identical, the root of the first chord is mapped onto the root of the second chord. This results in a counterintuitive pair of transformation vectors, $V_t[1, 0, 0, 0]$ or $V_t[-1, 0, 0, 0]$, and directed root motion of either one or eleven half steps.

Example 3.9. The Leittonwechsel SST subgroup.
Strauss uses both $L_1^*$ and $L_2^*$ in *Lob des Leidens* (Op. 15 No. 3/TrV 148 No. 3).

Example 3.10 shows a reduction of measures 8-17, a nonfunctional passage that achieves a modulation from $D\flat$ major through $G\flat$ major and eventually to $B\flat$ major, the parallel major of the home key. The passage features a progression with a descending stepwise bass line. The non-functional harmonies supported by this bass line in measure 12, $C^{o7}$ and $E^{b}m^{7}$, are related via $L_1^*$.

Example 3.10. Strauss, *Lob des Leidens*, mm. 9-17. Non-functional movement between $C^{o7}$ and $E^{b}m^{7}$ via $L_1^*$ in m. 12 is contrasted with movement between $E^{b}m^{7}$ and an enharmonic $G^{b}7$ via $L2^*$ in m. 16.
In measure 16, at the end of this passage, the harmonies begin to function in B♭ major. The first two of these harmonies are E♭m6 and an enharmonic G♭7 that function as iv6 and Gr+6 and proceed to a perfect authentic cadence in B♭ major in measure 17, also shown in Example 3.10. They are related via L2*, and although these harmonies can be interpreted as functional, this is only evident in retrospect, especially given the fact that the E♭m6 follows a root position D♭7, causing it to sound much like a root position G♭ major triad with an added sixth.

Strauss uses L3* in *Die Verschwiegenen* (Op. 10 No. 6/TrV 141 No. 6). The song begins with an unusual progression; B♭M7 functioning as a NM6 of A minor moves to the dominant, as shown in Example 3.11a. The tritone root relation between the two chords, the precipitous drop of a diminished tenth from B♭ to G♯, the forte dynamic marking, and the eighth note rhythmic value of the dominant combine to create a jarring effect that encapsulates the unhappiness and ultimately the violence expressed in the text. The song describes an unhappy secret that is told to flowers such as roses, violets, and chamomiles, which are then destroyed to ensure their silence. The movement from NM6 to V symbolizes this anger and the destruction of the flowers achieved by tearing them out of the ground. The use of flowers as a confidante in this unhappy secret is an inversion of the “loves me, loves me not” folk tradition in which petals are delicately plucked from a flower in an attempt to predict whether a beloved shares in feelings of love. It is an essentially hopeful act; if the first attempt results in “loves me not” the usual practice is simply to choose another flower and try again until the desired prediction is achieved. The deracination of the flowers in *Die Verschwiegenen* is not
hopeful and offers no such second chance. It is an act of finality in which the flowers are utterly destroyed, and this is symbolized by the NM\textsuperscript{6} to V progression. This progression, or simply N\textsuperscript{6} to V, occurs throughout the song, but its meaning is not revealed until the final two lines of text, which state that those who know the secret are dead and cannot reveal it. It is between these two climactic lines, shown in Example 3.11b, that Strauss uses L\textsubscript{3}\textsuperscript{*}, moving from NM\textsuperscript{6} not to V, as expected, but instead to B\textsuperscript{a\textsubscript{6}}. Both harmonies are functional in A minor, but since they mark the return of A minor in preparation for the final cadence, their harmonic function is evident only in retrospect, and even so, their juxtaposition is unusual. Instead, the transformational nature of the movement from B\textsuperscript{bM}\textsuperscript{6} to B\textsuperscript{a\textsubscript{6}} via L\textsubscript{3}\textsuperscript{*} is apparent. Like the opening progression, the upper voice makes a large leap by a dissonant interval, but instead of a leap of a diminished tenth from B\textsuperscript{b} down to G\# the leap is a major seventh upwards from B\textsuperscript{b} to A. It is this transformational movement coupled with the upward leap and a fortissimo dynamic level that finally express the violence of the text.
Example 3.11. Strauss, *Die Verschweigenen*; a. mm. 1-2; b. mm. 35 to 44.
The transformations in the *Relativ* SST subgroup all map the root of the first chord onto the seventh of the second chord, or vice versa. In this group, however, the movement is by whole step rather than half step and all transformational pairs consist of chords that are two “types” away from each other. The first transformation is Douthett and Steinbach’s R*, which is renamed here as R₁* due to the addition of two new transformations, R₂* and R₃*. In R₁* the transformational pair consists of a half-diminished and major-minor seventh chord with roots separated by a directed interval of either four or eight half steps. In R₂* the transformational pair consists of a minor seventh and major seventh chord, with roots separated by a directed interval of three or nine half steps. Because the intervallic content of the root, third, and seventh of a minor seventh chord is the same as that of the root, fifth, and seventh of a major seventh chord, each minor seventh chord shares three pitches with a major seventh chord that has a root either three or eight half steps higher. Therefore, there is another transformation, R₃*, with the same transformational pair, but with roots separated by a directed interval of four or eight half steps, depending on the starting chord. The *Relativ* SST subgroup is shown in Example 3.12, along with the unique transformation names and corresponding transformation vectors.
Example 3.12. The Relativ SST subgroup.

A example of R₁* can be seen operating on a large scale in the first movement of Strauss’s Skizzen (TrV 82), where a modulation from E minor to G major takes place in measures 30-35. The final functional harmony in E minor is an F♯ø7 that functions as ii₆₅ in measure 30. Rather than modulating with the use of a pivot chord, Strauss uses a series of four non-functional seventh chords in measures 31-34, leading to a root position D⁷ in measure 35 that functions as V⁷ in G major and resolves to the tonic, completing the modulation. The use of R₁* does not directly connect the ii₆₅ in E minor and the V⁷ of G major. Instead, the transformation is embellished via the intervening harmonies, shown in Example 3.13a. With the exception of the penultimate harmony, each successive seventh chord retains at least one common tone, shown as open note heads in Example 3.13b, while the remaining pitches move by half step to form a new non-functional seventh chord. Furthermore, the pitches that are held as common tones between any two seventh chords are only those pitches that are members of D⁷, and most of these common tones are also members of F♯ø⁷. In fact, the only pitch that is never held

\[
\begin{align*}
&D⁷ & f♯⁰⁷ \\
&R₁* & d⁷ & F^⁷ \\
&R₂* & d⁷ & B♭⁷ \\
&DM7-4-HD7 & MN7-3-MJ7 & MN7-8-MJ7 \\
&V₁[2, 0, 0, 0] & V₁[2, 0, 0, 0] & V₁[0, 0, 0, -2] \\
or & HD7-8-DM7 & MJ7-9-MN7 & MJ7-4-MN7 \\
&V₁[0, 0, 0, -2] & V₁[0, 0, 0, -2] & V₁[2, 0, 0, 0]
\end{align*}
\]
in common between any two seventh chords is E, the seventh of F♯⁷ and the very pitch that moves in the transformation to D⁷. The exception to this is in the penultimate harmony, G♯⁷, which functions much like a common-tone diminished seventh chord to the D⁷ that follows it.
Example 3.13. Strauss, *Skizzen*; a. mm. 30-36, with a harmonic reduction below; b. The common tones that nonfunctional harmonies share with F♯7 and D7. Common tones are shown with open note heads (the final measure is excluded).
The final SST subgroup consists of two entirely new transformations, all of which have transformational pairs that consist of either a fully-diminished seventh and a major-minor seventh chord or a fully-diminished seventh and a half-diminished seventh chord. Because a fully-diminished seventh chord is part of every transformational pair, these transformations are known as the Diminished SST subgroup. They are similar to the Weitzmann STT subgroup in that the fully-diminished seventh chord divides the octave evenly into minor thirds or their enharmonic equivalent, augmented seconds.\(^95\) Furthermore, also like the Weitzmann STTs, the Diminished SSTs are multivalent when they begin on the chord that divides the octave evenly. That is, when the first chord in the transformational pair is a fully-diminished seventh chord, the mapping of any one of its pitch classes onto a pitch class a half step above it results in a half-diminished seventh chord; the mapping of any one of its pitch classes onto a pitch class a half step below it results in a major-minor seventh chord. This is the case because the set-class to which the half-diminished seventh and major-minor seventh chord belong, 4-27, is a minimal perturbation of an equal division of the octave by minor thirds or augmented seconds.

The first Diminished SST is D\(1^*\). When starting on a fully-diminished seventh, any one of the four pitch classes in the chord is mapped onto the pitch class a half step higher, resulting in a half-diminished seventh chord. The pitch that moves becomes the seventh and one of the three unchanged pitch classes becomes the root of the new half-diminished seventh chord. That is, the new root is the pitch class that is three half steps above the pitch that moves, as illustrated in Example 3.14. In Example 3.14a, the C\(♭\) in the original D\(07\) moves to C. The new chord is a half-diminished seventh chord with a

\(^{95}\) In the Weitzmann STTs, it is the augmented triad that divides the octave evenly by major thirds or their enharmonic equivalent, a diminished fourth.
root, D, that is three half steps above the pitch that moves, C♭. In Example 14b, D in the original D♭7 moves to E♭, forming a new half-diminished seventh chord with F, the pitch class three half steps above D, as its root. Examples 3.14c and 3.14d follow the same pattern. Because a single fully-diminished seventh chord is multivalent and can move to one of four different half-diminished seventh chords, there are four possible unique transformation names and four possible transformation vectors, depending on which of the pitches in the fully-diminished seventh chord move. To clarify this situation, the “root” of the fully diminished seventh chord is always considered to be the pitch that is the root of the half-diminished seventh chord. This results in the same unique transformation name, FD7-0-HD7, and the same transformation vector, Vt[0, 0, 0, 1], for all instances of D♭* that begin on a fully-diminished seventh chord, as shown in Example 3.14.
The multivalence of the $D_1^*$ transformation acting on $D_\overline{7}$, leading to four different half-diminished seventh chords.

The situation is somewhat different when $D_1^*$ begins on a half-diminished seventh chord. Rather than moving to one of many different fully-diminished seventh chords, this transformation has only one possible result, at least in terms of pitch class content. In other words, $D_1^*$ moves to a specific fully-diminished seventh chord, but since any member of the chord can serve as the root this chord can be spelled in many different ways, all of which are enharmonically equivalent. The pitch class that moves downwards is always the seventh, as shown in Example 3.15, in which $C_\overline{7}$ chord moves to four fully diminished seventh chords via $D_1^*$, but the four fully-diminished seventh chords are enharmonically equivalent. To clarify the unique transformation name and the transformation vector, the “root” of the fully-diminished seventh chord is considered to be the pitch that is the root of the half-diminished seventh. This results in the same unique transformation name, HD7-0-FD7, and the same transformation vector, $V_d[0, 0, 0, -1]$, for all instances of $D_1^*$ that begin on a half-diminished seventh chord.
Example 3.15a-d. The $D_1^*$ transformation acting on four different half-diminished seventh chords, leading to four fully-diminished seventh chords, all of which are enharmonically equivalent to $D^07$.

When it begins on a fully-diminished seventh chord, the $D_2^*$ transformation works in the same manner as $D_1^*$, but with any one of its pitch classes mapped onto the pitch a half step below it, thereby forming a major-minor seventh chord, of which it is the root. Therefore, any fully-diminished seventh chord in the $D_2^*$ transformation is multivalent and can move to one of four different major-minor seventh chords. This is shown in Example 3.16a, where the $D^♭$ in the original $D^07$ moves to $D^♭$. The new chord is $D^♭7$. In Example 3.16b, the $F$ moves to $E$, forming $E^7$, and so on. As in the $D_1^*$ transformation, there are four possible unique transformation names and also four possible transformation vectors that could result from $D_2^*$. To clarify this situation, the seventh of the major-minor seventh chord is considered to be the “seventh” of the fully-diminished seventh chord, regardless of its spelling. This results in just one unique transformation name, $FD7-11-DM7$, and one transformation vector, $V_t[-1, 0, 0, 0]$. 

\[
\begin{array}{cccc}
\text{a.} & \text{b.} & \text{c.} & \text{d.} \\
\includegraphics[width=1\textwidth]{example.png} \\
D_1^* & D_1^* & D_1^* & D_1^* \\
D^07 & D^07 & D^07 & b^07 \\
\text{HD7-0-FD7} & \text{HD7-0-FD7} & \text{HD7-0-FD7} & \text{HD7-0-FD7} \\
V_t[0, 0, 0, -1] & V_t[0, 0, 0, -1] & V_t[0, 0, 0, -1] & V_t[0, 0, 0, -1] \\
\end{array}
\]
The multivalence of the $D_{2}^{*}$ transformation acting on $D_07$, leading to four different major-minor seventh chords.

Example 3.16a-d. The multivalence of the $D_{2}^{*}$ transformation acting on $D_07$, leading to four different major-minor seventh chords.

The multivalence of $D_{2}^{*}$ when it begins on a fully-diminished seventh chord is not present when the first chord is a major-minor seventh chord. When this is the case, the root of the major-minor seventh chord is mapped onto the pitch class a half step higher, forming a specific fully-diminished seventh chord, at least in terms of pitch class content. The actual spelling of the resulting chord is variable, but it is enharmonically equivalent with all other possible spellings. This is shown in Example 3.17, where $D_{b}7$, $E_7$, $G_7$, and $B_{b}7$ each move to a fully-diminished seventh chord via $D_{2}^{*}$, all of which are enharmonically equivalent but spelled differently. As in the situations described above, the seventh of the major-minor seventh chord is considered to be the seventh of the fully-diminished seventh chord, resulting in a single unique transformation name, $DM7-1-FD7$, and a single transformation vector, $V_t[-1, 0, 0, 0]$. 

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Example 3.17a-d. The $D_2^*$ transformation acting on four different major-minor seventh chords, leading to four fully-diminished seventh chords, all of which are enharmonically equivalent to $D^{07}$.

While the transformations of the Diminished SST subgroup are the most exotic of the SSTs, they are among the most commonly used in Strauss’s early music. For example, in the passage from *Lob des Leidens*, shown in Example 10 above and partially reproduced in Example 3.18, $D_1^*$ connects $A^{04}$ in measure 11 to the $C^{07}$ in measure 12.

Although they are separated by an intervening $G_{b}^{6}$, their connection to one another is made evident by the voice exchange between the bass and inner voice of the piano part.
Example 3.18. Strauss, *Lob des Leidens*, mm. 9-13. A\(^{o7}\) is transformed to C\(^{o7}\) via D\(_1^\ast\) and an intervening six-four chord.

Strauss’s use of D\(_2^\ast\) is illustrated in a passage from *Madrigal* (Op. 15 No. 1/TrV 148 No. 1), represented in the voice-leading sketch in Example 3.19. In measures 26-37 a nonfunctional progression achieves a modulation from F minor to the home key of E\(^\flat\) major. The bass line of the progression is almost completely stepwise, descending from F\(_3\) to G\(_2\). Most of the harmonies supported by this bass line are seventh chords and those that are not are second inversion triads that act as passing chords between two seventh chords. Beginning in measure 30 and continuing until measure 34, each new seventh chord is created via D\(_2^\ast\). The fully-diminished seventh chords are all enharmonic equivalents of the first chord, D\(^{o7}\). The major-minor seventh chords, on the other hand, are not the same. The first, in measure 31, is E\(^4\); the second is an enharmonic D\(^{b7}\) that is spelled like a German augmented-sixth chord in F minor. After arriving on B\(^{o7}\) in measure 34, the next three chords are also fully-diminished seventh chords, each a half-step lower than the previous chord, although they are spelled enharmonically as E\(b\)\(^{o7}\) and F\#\(^{o7}\). As if to confirm its importance in this passage, F\#\(^{o7}\) then moves to an enharmonic
$A_{♭}^7$ in measure 36 via $D_2^*$. This is spelled as a German augmented-sixth chord in C minor and it momentarily resolves to a cadential six-four in C minor, but this is soon revealed to be a first-inversion $E_{♭}$ major triad with an added sixth.
3.3 Compound Seventh Chord Transformations

All of the SSTs discussed in the previous section map one pitch in the first seventh chord onto a different pitch in the second seventh chord; all other pitches are mapped onto themselves. This, of course, maximizes voice-leading parsimony between the chords and can lead to an elegant analysis, especially when multiple SSTs are used in succession. In spite of this fact, SSTs are not particularly common and they are certainly less prevalent than transformations that map two or more pitches onto a different pitch while retaining the rest as common tones. These types of transformations, like their triadic analogues, are called compound seventh chord transformations (CSTs). There are many possible CSTs, far more than the twelve SSTs explored above. Any seventh chord moving to a different seventh chord while mapping two or more pitches onto other pitches may be considered a transformation, depending on the harmonic context. Because of this, the CSTs are not assigned abbreviations such as P₁* or D₂*, but are instead only given unique transformation names. The transformation vectors of the CSTs have at least two nonzero values rather than the single nonzero value of the SSTs, and like the SSTs, this value is never more than a whole step up or down.

Whether to consider movement from one seventh chord to another in a transformational light is dependent on the context of the progression. Non-functional progressions are almost always viewed in transformational terms, but it is possible to imagine situations in which the movement between seventh chords is not seen as transformational in these types of progressions. In fact, the greater the number of pitches that are mapped onto different pitches, the greater the likelihood that the movement could
be viewed in strictly contrapuntal terms, such as in Example 3.19 above, where B⁷ moves to an enharmonic B♭⁷ and then to an enharmonic A⁰. The unique transformation names for both are the same, FD7-11-FD7, as are the transformation vectors, V_d[-1, -1, -1, -1]. In this case, however, it is better to recognize that the movement is completely parallel between the two sets of seventh chords and because of this it is more advantageous to view the progression in a contrapuntal, rather than a transformational, light. This is not to suggest that the unique transformation names and transformation vectors cannot be applied to this progression. Rather, it is to suggest that if they are used they may not convey the best interpretation of the movement between the seventh chords.

At the same time, there are progressions that are functional, but which can be analyzed as transformational. One such example in Strauss’s early music is in measure 9 of Die Verschweigenen, shown in Example 3.20. The passage is in G minor, but only transiently, with an approach to an authentic cadence that never reaches its conclusion. In measure 9, A⁷ that functions as V⁶⁵/V in G minor moves to an A⁰ that functions as ii⁰⁶⁵. While both chords are functional in G minor, it is unusual for V⁶⁵/V to move to ii⁰⁶⁵, since it frustrates the resolution of C#, the leading tone of the chord. Viewed as a transformation, however, it is DM7-0-HD7, with a transformation vector of V_d[0, -1, -1, 0]. This interpretation is even more convincing in light of the prolongation of V⁶⁵/V from measures 7 to 9 by means of Gm⁴ in measure 10. Rather than viewing this harmony as a nonfunctional “neighbor” six-four with an added seventh, it is better understood as a transformation in which three of the pitches in V⁶⁵/V move up by half step, then immediately return to their original position. The use of this transformation, DM7-10-MN7 V_d[1, 1, 1, 0] and its reciprocal MN7-2-DM7 V_d[0, -1, -1, -1] reveal DM7-0-HD7 in
measure 9 to be a continuation of the incremental voice leading in the movement toward the cadential six-four in measure 9. Another signature feature of this passage is the retention of G♮ in all of the harmonies. Its importance is revealed in measure 10, where it is the highest note sounding above the cadential six-four. Although the G minor cadence never materializes, the importance of G♮ continues into the next key area as it moves down to F♯, although not as part of the dominant of G minor. Instead, the F♯ is an enharmonic G♭ that immediately returns to G♮ via P as part of an E♭ major triad that functions as the Neapolitan chord in D minor.
Die Verschweigenen, mm. 7-12

Example 3.20. *Die Verschweigenen*, mm. 7-12
Chapter Four: Cardinality Transformations

4.1 Simple Cardinality Transformations

The previous two chapters presented a system of transformation between chords that contain the same number of pitches; Chapter Two presents a system of transformation between triads and Chapter Three presents a corollary system of transformations between seventh chords. Although examples of these types of transformations abound in the music of Strauss’s first period, passages that consist solely of triads or seventh chords are rare. Instead, most non-functional passages consist of a mixture of triads and seventh chords. This suggests that a system of transformation between chords with different numbers of pitches – different cardinalities – is necessary to complete a transformational system. These types of transformations are therefore designated as cardinality transformations.

Because the retention of common tones is a primary concern in a transformational approach, only those cardinality transformations that retain at least two common tones between a triad and a seventh chord are considered simple cardinality transformations (SCTs). There are two possible ways in which two or more common tones may be retained in a cardinality transformation: furcation and bifurcation.96

96 Two common tones may also be retained with a combination of a furcation and a transformation, but since this involves two distinct mappings it is therefore not an SCT. These types of cardinality transformations are discussed in section 4.2.
In the first of these, the furcation, three common tones are retained in the transformation from triad to seventh chord (or vice versa). Therefore all three pitch classes of the triad are contained in the seventh chord. This is achieved by the “furcation” of one of the pitch classes in the triad. That is, a pitch class “splits” such that it maps onto itself and also onto a different pitch class. For example, a major triad can be mapped onto three different seventh chords that contain all three of its pitch classes plus one other pitch class. These three chords are a major seventh, a major-minor seventh, and a minor seventh chord. If this mapping is applied to CM, it results in CM₇, C⁷, or Am⁷, as shown in Example 4.1.

Example 4.1. The mappings of a C major triad onto seventh chords via furcation: a. onto CM₇; b. onto C⁷; c. onto Am⁷. Common tones are shown as open note heads.

In Examples 4.1a and 4.1b, the third and fifth of the triad are mapped onto themselves, but the root is also mapped onto a different pitch that becomes the seventh of the next chord. In 4.1a, the root maps onto itself and also onto B, forming CM₇. In 4.1b, the root maps onto itself and also onto B♭, forming C⁷. The mapping in 4.1c differs only

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97 “Furcation” and its sister term “bifurcation” both refer to the separation of one thing or object into more than one thing or object. Like the triadic and seventh chord transformations of the previous chapters, cardinality transformations are two-way transformations that can move from a triad to a seventh chord or vice versa. For this reason, in the present study “furcation” and “bifurcation” refer to the mapping of one pitch onto two different pitches and also to the mapping of two different pitches onto one pitch.
in that it is the fifth that maps onto itself and a different pitch, A, forming Am\(^7\). When they occur on their own, furcations only involve the root or the fifth of triads and form (or arise from) the root and seventh of seventh chords.

The second type of SCT is the bifurcation, in which only two common tones are retained between the triad and seventh chord and one pitch class of the triad is mapped onto two different pitch classes. In SCTs that include major, minor, and diminished triads, only the root or fifth of the triad can participate in a bifurcation. When augmented triads are part of an SCT, however, any member of the triad may participate. An example of a bifurcation SCT is shown in Example 4.2, where Cm is transformed into a major-minor seventh chord or a major seventh chord.

Example 4.2. The mappings of a C minor triad onto seventh chords via root bifurcation: a. onto Eb\(^7\); b. onto Eb\(\flat\)M\(^7\). Common tones are shown as open note heads.

In Example 4.2a, the third and the fifth of Cm are mapped onto themselves, but the root is not retained across the transformation. Instead, it bifurcates, mapping onto two different pitches, Db and Bb, thereby forming Eb\(^7\). Likewise, in Example 4.2b the third and fifth are again mapped onto themselves and the root bifurcates, this time mapping onto D and Bb, thereby forming Eb\(\flat\)M\(^7\).
As with the furcations shown in Example 4.1, bifurcations can act not only on the root of a triad, but also the fifth, as shown in Example 4.3, where the fifth of Cm bifurcates in four different ways, forming Ab\(^7\), C\(^\flat\)7, Fm\(^7\), and F\(^7\), respectively.

Example 4.3. The mappings of a C minor triad onto seventh chords via fifth bifurcation: a. onto Ab\(^7\); b. onto C\(^\flat\)7; c. onto Fm\(^7\); d. onto F\(^7\). Common tones are shown as open note heads.

Examples 4.1 to 4.3 show SCT furcations and bifurcations that involve major and minor triads on one side of the transformation. These types of transformations are also possible with diminished triads, shown in Example 4.4 using C\(^\flat\) as the starting chord, followed by four furcations of the root and fifth.

Example 4.4. The mappings of a C diminished triad onto seventh chords via furcation of the root and fifth: a. onto C\(^\flat\)7; b. onto C\(^\flat\)7; c. onto Ab\(^7\); d. onto C\(^\flat\)7. Common tones are shown as open note heads.
In Example 4.4a the third and fifth of the triad map onto themselves while the root maps onto itself and also onto B♭, forming C⁰⁷. Momentarily setting aside Example 4.4b, in Example 4.4c the root and third map onto themselves while the fifth maps onto itself and also onto A♭, thereby forming A♭⁷. Returning to Example 4.4b, the third and fifth of the triad map onto themselves and the root maps onto itself and B♭♭, forming C⁰⁷. In Example 4.4d, C⁰⁷ is also formed, but with a different set of mappings. Here, the root and the third map onto themselves while it is the fifth that maps onto itself and B♭♭. In spite of the fact that the mappings in 4.4b and 4.4d start on the same triad and end on the same seventh chord, there is no way to favor one interpretation over the other. The composite distance from the root to B♭♭ in Example 4.4b and the fifth to B♭♭ in Example 4.4d is identical: three half steps. In this case, rather than arbitrarily preferring one interpretation over another, the transformational interpretation is instead dependent on the musical context.

Bifurcations that include diminished triads do not present the same possibility for ambiguity as seen in the furcations shown in Example 4.4b and 4.4d. Rather, they are straightforward, as shown in Examples 4.5 and 4.6, all starting on C⁰.

Example 4.5. The mappings of C⁰ onto seventh chords via bifurcation of the fifth: a. onto Fm⁷; onto A♭M⁷; c. onto F⁷; d. onto a C⁰⁷. Common tones are shown as open note heads.
Example 4.6. The mappings of $C^0$ onto seventh chords via bifurcation of the root: a. onto $E♭m^7$; b. onto $C♭M^7$; c. onto $E♭ø^7$; d. onto $C♭^7$. Common tones are shown as open note heads.

SCT furcations and bifurcations are only possible from the roots and fifths of major, minor, and diminished triads. SCTs that include augmented triads differ from those above in two ways. First, furcations are not possible with augmented triads since none of the five seventh chords considered in this study include an augmented triad within them as a subset. They also differ in that bifurcations can occur on the third of the triad in addition to the root and fifth. This can be seen in Examples 4.7 through 4.9, where each transformation begins on $C^+$.

Example 4.7. The mappings of $C^+$ onto seventh chords via bifurcation of the fifth: a. onto $Am^7$; b. onto $F^♯ø^7$; c. onto $C^7$. Common tones are shown as open note heads.
Example 4.8. The mappings of C+ onto seventh chords via bifurcation of the root: a. onto C#m7; b. onto A#ø7; c. onto E7. Common tones are shown as open note heads.

Example 4.9. The mappings of C+ onto seventh chords via bifurcation of the third: a. onto Fm7; b. onto Dø7; c. onto A♭7. Common tones are shown as open note heads.

Because the augmented triad divides the octave evenly, bifurcations of each member of the triad results in the three seventh chords, each of a different quality: minor seventh, major-minor seventh, and half-diminished seventh. Furthermore, the roots of the seventh chords of the same type that result from the bifurcation of the members of the augmented triad are all separated by four half steps, the same interval that separates each member of the triad.
4.2 Compound Cardinality Transformations

SCTs result in either two or three common tones retained across the transformation. They are regarded as “simple” transformations because they consist only of a furcation or bifurcation. In other words, a single pitch is mapped onto itself and another pitch, a single pitch is mapped onto two different pitches, or the reverse of either or these two processes takes place. Cardinality transformations where more than one pitch is mapped onto a different pitch are also possible and are known as compound cardinality transformations (CCTs). The least disjunct CCT retains two common tones through a combination of a furcation and a transformation. That is, one pitch in a triad maps onto itself and also onto a new pitch – a furcation – and another pitch in the triad maps onto a different pitch, just as in a triadic or seventh chord transformation. This is shown in Example 4.10, where Cm is transformed into four different seventh chords via a combination of furcation and transformation. In Example 4.10a, the root maps onto itself and B, a furcation, while the third maps onto E, forming CM7. Example 4.10b is nearly identical, but the root maps onto itself and B♭, forming C7. In Example 4.10c, the fifth maps onto itself and A while the third maps onto E, forming Am7. Finally, in Example 4.10d the root maps onto itself and B♭ as in Example 4.10b, but the fifth maps onto G♭, forming C♭7.
Example 4.10. The mappings of a Cm onto seventh chords via a combination of furcation and transformation: a. onto CM\(^7\); b. onto C\(^7\); c. onto Am\(^7\); onto C\(^\flat\)\(^7\). Common tones are shown as open note heads.

The combination of furcation and transformation is straightforward in all instances except for those that include diminished triads, where two different seventh chords may be arrived at through two different combinations of furcation and transformation. This is shown in Example 4.11, where C\(^0\) maps onto seventh chords in six distinct ways, yet produces only four distinct seventh chords. In Examples 4.11a and 4.11b, Cm\(^7\) and A\(^\flat\)m\(^7\) are formed through straightforward combinations of furcation and transformation and need not be described here. The furcation and transformations in Examples 4.11c and 4.11d, while differing from each other, result in the same D\(^7\). In 4.11c the fifth maps onto itself and A while the third maps onto D. In 4.11d, the root maps onto itself and A while the third again maps onto D. Since the root and the fifth of the triad are equidistant from A and the mapping of the third is identical in both instances, there is no way to privilege one transformational interpretation over the other. Both are equally valid and the choice of interpretation depends on the musical context. Examples 4.11e and 4.11f are similar to the previous two examples, since both map C\(^0\) onto F\(^\#\)\(^\flat\)\(^7\) via two distinct sets of furcations and transformations. In Example 4.11e, the fifth of the triad maps onto itself and A while the third maps onto E. In Example 4.11f it
is the root that maps onto itself and A while the third again maps onto E. Again, there is no way to privilege one interpretation over the other, except through the musical context.

Example 4.11. The mappings of $c^0$ onto seventh chords via furcation and transformation: a. onto $Cm^7$; b. onto $A^♭m^7$; c. onto $D^7$; d. onto $D^7$; e. onto $F^♯ø^7$; f. onto $F^♯ø^7$. Common tones are shown as open note heads.

Finally, CCTs may only retain a single common tone, or even none at all. When this is the case, it involves either a furcation with two or more transformations or bifurcation with one or more transformations. The set of possible CCTs is vast, but none require illustration here, since sections 4.3 and 4.4 will illustrate how these types of transformations may be handled.

4.3 Unique Transformation Names

As with triadic and seventh chord transformations, cardinality transformations have unique transformation names. The naming convention is the same as that in the previous two chapters. The quality of the initial harmony is listed, followed by the directed interval between the root of the first harmony and the root of the second harmony, which is then followed by the quality of the second harmony using the
abbreviations shown in Chapters Two and Three. For example, the cardinality transformations from Example 4.1 are reproduced below as Example 4.12. All of the transformations begin on CM so the initial part of their unique transformation name is the abbreviation “MJ.” The seventh chords in Examples 4.12a and 4.12b share the same root as the starting triad so the directed interval between the roots of the two chords in this transformation is 0. Similarly, the root of the seventh chord in Example 4.12c is A, so the directed interval between the roots of the two chords in this third transformation is 9. Finally, the quality of the final harmony in each transformation is major seventh, major-minor seventh, and minor seventh chord, respectively. Therefore, the final portion of each unique transformation name is the corresponding abbreviation – “MJ7,” “DM7,” and “MN7.”

Example 4.12. Cardinality transformations from CM to three different seventh chords via bifurcation, with unique transformation names shown below each seventh chord. Common tones are shown as open note heads.

If the transformations in Example 4.12 are reversed, the outer portions of the unique transformation names are exchanged while the directed interval remains the \(\text{mod}_{12}\) complement of the directed interval of the original transformation. This would

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98 The abbreviations for triad are as follows: major – MJ; minor – MN; diminished – DM; augmented – AU. The abbreviations for seventh chords are major seventh – MJ7; major-minor seventh – DM7; minor seventh – MN7; half-diminished seventh – HD7; fully diminished seventh – FD7.
result in the unique transformation names of MJ7-0-MJ, DM7-0-MJ, and MN7-3-MJ, respectively.

4.4 Transformation Vectors of Cardinality Transformations

Because pitch class mappings in a cardinality transformation are not always one-to-one, the transformation vectors for this type of transformation require modification in relation to those of the triadic and seventh chord transformations of the previous two chapters. One difference is that every transformation vector requires four values regardless of whether the transformation moves from triad to seventh chord, or vice versa.

In furcations and bifurcations that begin on a triad, two pitches map onto themselves while the third pitch either maps onto itself and a different pitch or maps onto two different pitches. This is shown in Example 4.13a, a furcation in which C° moves to A♭7, and Example 4.13b, a bifurcation in which C° moves to Fm7. In both examples, the root and third of the diminished triad map onto themselves, resulting in a zero in the first two positions of each transformation vector, representing the fact that each of these pitches moves zero half steps in the transformation. The last two positions of the interval vector represent the mappings of the fifth of the triad in each transformation. The distance in half steps of each mapping is shown as usual but the fact that it is this member of the triad that is the furcated or bifurcated pitch is shown by the asterisk following each value. Finally, the fact that both these cardinality transformations begin on triads and end on seventh chords is shown by a plus sign (+) indicating that the transformation results in a harmony with a greater cardinality than the starting harmony.
Example 4.13. The unique transformation names and transformation vectors of two cardinality transformations from C\textsuperscript{o}. Common tones are shown as open note heads.

Four positions are required in cardinality transformation vectors even when the transformation begins on a seventh chord and ends on a triad. This is illustrated in Example 4.14a, where C\textsuperscript{7} moves to E\textsuperscript{o} via furcation. In the first transformation, the third and fifth of the seventh chord map onto themselves, so the second and third position of its transformation vector reflects their movement of zero half steps. The root of the seventh chord maps onto B\textsuperscript{♭} two half steps lower, so the first position in the transformation vector is −2. The seventh maps onto itself, so the final position in the transformation vector is zero. The first and fourth position are marked with an asterisk because they are the two pitches that would arise from the furcation of a single pitch had the transformation begun on the triad and moved to the seventh chord.

Example 4.14b illustrates a similar situation, where C\textsuperscript{7} moves to Em by means of a bifurcation. The third and fifth map onto themselves, so the second and third positions of the transformation vector again reflect the movement of zero half steps by these pitches. The root of the seventh chord maps onto B, so the initial position in the transformation vector is −1. Finally, the seventh also maps onto B, and the final position
in the transformation vector is 1. Similar to the preceding example, the first and final positions are marked with an asterisk to indicate that these are the pitches that would arise from the bifurcation of a single pitch had the transformation begun on a triad and then moved to the seventh chord. Finally, the fact that these cardinality transformations proceed from seventh chord to triad, resulting in a harmony with a smaller cardinality than the first, is reflected in the minus sign (−) that follows each transformation vector.

Example 4.1. The unique transformation names and transformation vectors of two cardinality transformations from C7. Common tones are shown as open note heads.

Transformation vectors of CCTs differ from the transformation vectors shown above in that one of the two pitches that is not part of the furcation or bifurcation maps onto a different pitch rather than onto itself. Therefore one of the positions in the transformation that does not have an asterisk will be a nonzero value. This is shown in Example 4.15, where Cm7 moves to Eb. Here, the root maps onto B♭, two half steps lower; the third maps onto Eb, a half step lower; and the fifth and the seventh map onto themselves. The pitches that take part in the furcation, in the first and final position, are marked with an asterisk. The second position in the transformation vector is not marked.

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by an asterisk to show that this is a simple transformation brought about by a one-to-one mapping of two different pitches.

Example 4.15. The unique transformation names and transformation vectors of a CCT from $C^7$ to $E_b$. Common tones are shown as open note heads.

4.5 Examples of Cardinality Transformations in Strauss’s Music

Although all of the examples in this chapter thus far have been purely theoretical, cardinality transformations are common in Strauss’s early works. This can be seen in one of his earliest compositions, the Concert Overture in C Minor. The overture is in sonata form, and while there are several passages where transformational harmonic movement is prevalent, three salient instances are examined here due to their inclusion of cardinality transformations, their relationship to one another, and also their structural significance.

The overture opens not with the principal thematic material, but rather with an introduction comprised of melodic fragments of the first theme played in unison by the strings and shown in a reduced score in Example 4.16. These fragments are punctuated by various harmonies, both triads and seventh chords, that are not functional.
Example 4.16. Reduced score of Strauss, Concert Overture in C Minor, mm. 1-18. Some octave doublings have been omitted.
Viewed in the context of traditional harmonic function, shown beneath the reduction of the score in Example 4.17, the passage makes only partial sense, since some of the progressions are unorthodox. For example, the fourth harmony, NM⁶, is followed by ii⁰⁷, reversing the traditional voice-leading paradigm of the Neapolitan harmony in which the lowered supertonic (♭2) descends to the leading tone (♯7) as part of a dominant harmony, either directly or after moving through the tonic pitch (♭1) as part of a cadential six-four. The same reversal of voice-leading expectation occurs between the next two chords, ii⁰⁷ and vii⁰⁷/V, in which the natural minor form of the submediant (♭6) moves to its raised form (♯6) rather than to the dominant pitch (♯5).

Example 4.17. Harmonic reduction of Concert Overture in C Minor, mm. 1-18.

Another aspect of this progression that does not conform to traditional harmonic practice is the lack of resolution of the chordal sevenths in the NM⁶, ii⁰⁷, and vii⁰⁷/V harmonies. Chordal sevenths have a tendency to resolve downward by step, and this resolution usually takes place in the same voice. A typical resolution occurs in this passage with the movement of VIM⁷ to iv, in which G, the chordal seventh of the first
chord, resolves downward by step to F. The next three seventh chords, however, fail to resolve in this manner.

One interpretation of this passage is that the anomalies that arise in the course of this harmonic progression are simply a byproduct of linear motion, especially in the upper voice. Thus, there are six functional harmonies in the first eighteen measures, shown in Example 4.18, and three other harmonies that contain non-harmonic pitches. Therefore, the second harmony is really a tonic triad with an $A_b$ anticipation and the fourth and fifth harmonies are a subdominant triad with $D_b$ and $D^\#$ passing tones. While the functional harmonies are certainly more important in terms of the harmonic structure of the introduction, a more satisfying interpretation of this passage can be obtained using a transformational analysis of the harmonies in which the movement from one harmony to the next is also viewed in light of the preservation of common tones with minimal stepwise motion in the pitches that move.

Example 4.18. Linear interpretation of the harmonies in the Concert Overture in C Minor, mm. 1-18.
This type of transformational analysis is shown in Example 4.19. In 4.19a, the functional harmonies are identified by the roman numeral analysis, with the nonfunctional harmonies shown below them identified by their quality and inversion. Example 4.19b, shows the transformations between the harmonies. Here, the first four harmonies are connected by means of three SCTs – two furcations and a bifurcation – and this is followed by two more harmonies connected by an SST and a CST. The transformations show the relationship between the prolongation of the tonic harmony and the initial prolongation of the subdominant harmony through MN-8-MJ7, although the subdominant prolongation is then extended via MJ7-1-HD7 and HD7-4-FD7.

At this point in the introduction, the harmonies become fully functional, with the $F\#_5$ in measures 11 and 12 functioning as $vii^6_5/V$, and proceeding to the cadence. The transformation vectors show the emphasis on smooth voice leading and preservation of common tones. Another aspect of this progression that is revealed by the transformation vectors is that the transformations that prolong a functional harmony – whether they are cardinality or seventh chord transformations, show the movement of only a single pitch by one half step. The prolongation of the tonic harmony is achieved through the movement of a single pitch by one half step; the prolongation of the subdominant harmony is achieved in the same way. However, the movement among the truly
functional harmonies in measures 5 and 11 involve far less common tone preservation, as shown in the transformation vectors of MJ7-9-MN, $V_t[0, 0, 2^*, 2^*]$ and HD7-4-FD7, $V_t[1, 1, 0, 0]$.

The introduction material returns at rehearsal letter G in measure 192, the beginning of the recapitulation. Here, the interpretation above is reinforced. Although quite similar to measures 1-18, the introductory material is slightly altered and considerably lengthened. The first twelve measures, 192-203, are identical to measures 1-12 except for the presence of a dominant pedal tone. In measure 204, the Cm$^6$ in measure 13 that functions as a cadential six-four in C minor is replaced with C$^7$, which functions as the dominant of F minor and begins a tonicization of that key, further prolonging the subdominant of C minor and eventually leading to $V^7/V$ in measure 212. Since this is a functional harmony in C minor, it represents the culmination of the subdominant prolongation. Therefore, the movement from F$^♯^7$ in measure 202 to D$^7$ in measure 212 can be viewed as a large-scale transformation, shown below Example 4.20. Upon the conclusion of the subdominant prolongation, there is a prolongation of the dominant through pedal six-four chords, finally followed by the arrival on C major in measure 222.
Example 4.20. Harmonic reduction of the beginning of the recapitulation, Concert Overture in C Minor, mm. 192 to 217.

Although the salient feature of this passage is the prolongation through both nonfunctional and functional means, the movement into the recapitulation in measure 192 is also worth considering from a transformational perspective. Beginning in measure 186, Ab\(^7\) seems to function as the dominant of Db major. Rather than resolving to a tonic chord, however, it is reinterpreted as a common-tone Gr\(^{+6}\) in C minor, moving directly to the tonic chord in measure 192, as shown in Example 4.21. This direct movement to the tonic resolves the dissonance of the augmented sixth and at the same time preserves two common tones with minimal motion in the other voices, the hallmarks of a transformation.
Example 4.21. Harmonic reduction of transformational movement into the recapitulation, Concert Overture in C Minor, mm. 186-192.

The last appearance of the introductory material is in the final eleven measures of the overture, shown in reduced score in Example 4.22a. Here, Strauss compresses the passage compared to its original length, yet it is the transformational material that is retained, with some harmonic alteration. After arriving on Fm in measure 325 that functions as iv in C major, a series of transformations move through four different nonfunctional seventh chords. As shown by the transformation vectors in Example 4.22b, the voice leading between the chords consists of a single half step movement in three of the four transformations, and two half steps in the other. In spite of the fact that the harmonies are nearly identical to those in measures 8-12, it is the tonic rather than the subdominant that is prolonged here. This is achieved through the half-step movement from C to E in the soprano and also the inversion of every harmony such that C is the bass note.
Example 4.22.  a. Transformational interpretation of measures 322-332, Concert Overture in C Minor; b. Transformations and transformation vectors of mm. 324-327.
The addition of cardinality transformations in the present chapter completes the system of transformations introduced in this study.\(^{99}\) Up to this point, the examples of the various transformations used by Strauss in the first period works have been brief due to the necessity of illustrating many different transformations. Most of the transformations in these examples are shown to operate on a small scale without regard for how they might be integrated into the framework of the pieces from which they are taken. Chapter Five, by contrast, analyzes a single composition in its various aspects, all of which are permeated by transformations of different types and at multiple structural levels, from that of a motive at the surface level to the deeper tonal structure of the entire work.

\(^{99}\) A complete list of CCTs can be found in Appendix C.
Chapter Five: “Geduld,” Op. 10 No. 5

5.1 Introduction

Among all Strauss’s pre-tone poem works, perhaps the most illustrative of his transformational approach to harmony is the song “Geduld.” Composed in 1883, it is a setting of the poem of the same name from Gedichte, by Hermann von Gilm (1812-1864). The transformational harmonic relationships in “Geduld” are apparent from the outset and permeate the entire song at all levels, from the musical surface in motivic form, to the phrase level in chord-to-chord movement, and ultimately to the large-scale tonal structure. Strauss also integrates transformational harmony into the rhetoric of the poem, using it to illustrate the state of mind of the speaker, thereby enhancing the dramatic narrative. And yet in spite of this use of transformational harmony throughout the song, Strauss strikes a balance between it and traditional functional harmony, creating a seamless whole that is an organic expression of the poetic content.

There are at least two versions of “Geduld.” Both versions appear in multiple collections of Gilm’s poetry and it is unclear which version was written first, since the earliest publication date of either version found for this study was 1864, the year of the author’s death. The version Strauss used is from Hermann von Gilm, Gedichte von Hermann von Gilm (Wein, Verlag von Carl Gerold’s Sohn, 1864), 296-7. The other version is found in Hermann von Gilm and Arnold von Passer, Ausgewählte Dichtungen von Hermann von Gilm (Leipsig, Verlag von A. G. Liebeskind, 1889), 137-8.
5.2 Text and Musical Form

The text of the song is written in first person, through which the speaker (a young man) addresses his beloved, who urges him to exhibit patience – “Geduld.” Each of the three stanzas is an eight-line complaint beginning with the text, “Geduld, sagst du, ...” (“Patience, you say, …”). The complaints intensify in each successive stanza, finally ending with the speaker declaring that he will never see her again. While the object of his impatience is never specified, it is presumably of a romantic and sexual nature, a topic well-suited to a composer in his late teenage years.

There are at least two versions of the poem and it is unknown whether Strauss was aware of both, although it is conceivable that he was since the song was composed in 1883 and both versions were written prior to 1864, the year of Gilm’s death. If Strauss was indeed familiar with both versions, his choice of which version to use is telling. The unused version of “Geduld” is shown in Example 5.1a in the original German and also in an English translation. The version that Strauss chose is shown in Example 5.1b, again in German with an English translation. The differences between the versions are indicated with underlined text, though both versions use iambic pentameter for each line of the text, and neither departs from the alternation between the unstressed endings of the odd-numbered lines and the stressed endings of the even-numbered lines. In general, the changes in the version Strauss chose serve to personalize the narrative and intensify its drama, especially in the drive toward the dramatic climax. For example, in the second

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101 Emily Ezust assisted in the translation from the German.
102 Unstressed endings are sometimes referred to as “feminine” endings and end with an unstressed final syllable. Likewise, stressed endings are sometimes called “masculine” endings and end with a stressed final syllable.
stanza the final two lines are altered from the unused version: “Open up! open up! what we do not gain today / Is our parting’s eternal loss,” is instead: “Open up! open up! what we do not gain today / Is tomorrow's irrecoverable loss,” thereby narrowing the focus away from a more nebulous loss happening after a possible future parting to a more threatening, irrecoverable loss that is a direct result of his beloved’s rejection at that moment. The most drastic difference, however, is in the final stanza. In the unused version, the speaker claims that he is leaving “once again” but that the “last tear is not shed,” suggesting the possibility of further patience on his part. The version that Strauss chose, on the other hand, allows for no such possibility. Instead, the speaker refuses to be patient, saying, “Therefore, fare thee well, I will never see you again: / My adamant fate thus wills it.” With this change, the finality of the speaker’s refusal to wait is intensified by his decision to end the relationship with his beloved over it.
Geduld, sagst du, und zeigt mit weißem Finger 
Auf meinen Zukunft festgeschloss'ne Tür;
Ist die Minute, die da lebt, geringer
Als jene ungeborenen? Sage mir!
Kannst mit der Liebe du den Lenz verschieben,
Dann borg' ich dir für eine Ewigkeit —
Doch mit dem Frühling endet auch das Lieben,
Und keine Herzens-Schulden zahlt die Zeit.

Geduld, sagst du und senkst die schwarze Lokke
Und stündlich fallen Blumenblätter ab,
Und stündlich fordert eine Totenglocke
Der Träne letztes Fahrgeld für ein Grab.
Sieh' nur die Tage schnell vorüber, an die Brust:
Mach auf, mach auf, wenn wir nicht heut' gewinnen,
Ist unser Scheiden ewiger Verlust.

Geduld, sagst du und senkst die Augenlider,
Und alle meine Fragen sind verneint;
Geduld! Geduld! verlassen bin ich wieder,
Die letzte Träne ist noch nicht geweint,
Ich aber hab' zum Lieben und zum Küß
Nur einen Frühling, wie der Rosenstrauch.

Example 5.1. "Geduld"; a. The unused version; b. The version used by Strauss.
Underlined text signifies changes between the versions.
The form of “Geduld” mirrors that of the poem. The song, in A♭ major, is divided into three sections, each corresponding to a stanza of the text. The first two sections are roughly equal in length while the final section is substantially longer. The first and third sections are preceded by a six-measure introduction based on the Geduld motive, discussed in more detail in section 5.3 below, although the introduction to the third section is in A♭ minor. The end of the first section elides with the beginning of the second section, which is preceded by a two-measure introduction also based on the Geduld motive. Within the large-scale tonal structure, shown in Example 5.2, each section is tonally closed, beginning and ending in either A♭ major or A♭ minor. Modulations within the sections are common, with tonal instability increasing as the work progresses, culminating in the third section. In the first two sections, the subordinate keys are all closely related to the tonic key of A♭ major, with the exception of C♭ major, the relative major of A♭ minor that closes the second section. This increase in tonal instability within the sections is illustrative of the speaker’s state of mind, representing his growing unhappiness, frustration, and ultimate hopelessness. This process culminates in the final verse, which begins in A♭ minor – itself an expression of the speaker’s declining optimism – and where only one of the subordinate keys, B♭ minor, is closely related to the original A♭ major tonic. The other keys, G minor, E major, and C major, are all distantly related to A♭.\footnote{E major, however, enharmonically reinterpreted as F♭ minor, is closely related to A♭ minor.} As explained below in section 5.8, however, the final two distantly-related keys are even more unstable than can be represented in the form diagram. This is because they are not confirmed by any surface-level cadential progression. Instead, they exist within an area that is harmonically
volatile, and they emerge by nature of the fact that they exhibit briefly coherent tonal motion (such as V - I), are suggested through prolonged repetition of consonant root-position triads, are enhanced by prominent melodic gestures, or some combination of these procedures.
Example 5.2. The large-scale form of “Geduld.”
5.3. The *Geduld* Motive and Transformation as Harmonic Prolongation

As discussed above, the drama of the poem is generated by the speaker’s impatience and the resulting frustration that arises as a result of having to wait at the behest of his beloved. Strauss captures this sense of impatience in the opening motive of the song through transformational harmonic procedures. This “*Geduld*” motive, shown in Example 5.3, begins with a perfect fifth. Lacking a third, it is merely the skeletal frame of a triad. The third is belatedly supplied in the guise of B♮, the enharmonic equivalent of C♭, forming an enharmonic A♭m. Further complicating the situation, the E♭ moves through an F upper neighbor over B♮, creating an enharmonic Fø7. While the enharmonic A♭m and Fø7 harmonies may simply be regarded as borrowed from the minor mode, they are not functional harmonies. Instead, it is their common-tone relationship to A♭M that is of importance here. As the F resolves back to E♭, the B♮ moves upward to C and the triad is revealed to be major on the last eighth note of the measure.

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104 For a more detailed examination of the half-diminished seventh built on the sixth scale degree, see Cameron Logan, “The viø7 Harmony Reconsidered” (paper presented at the 32nd Annual Meeting of the Texas Society for Music Theory, Baylor University, February 27, 2010).
Example 5.3. The *Geduld* motive.

Whereas its quality is ambiguous, the opening perfect fifth implies a major triad by virtue of the fact that the triadic major third appears earlier in the harmonic series than the minor third. The movement from this “apparent” A♭M to A♭m is one of the Riemannian STTs: MJ-0-MN, a version of P. The subsequent movement to an A♭ major triad reverses this transformation with MN-0-MJ, the reciprocal version of P. The fact that the initial harmony begins on an open fifth and is only an apparent A♭M only serves to further emphasize the delay of the actual A♭M at the end of the measure, as shown in Example 5.4. It is not until the last moment that the actual tonic harmony is heard. Thus the A♭m and F♭7 harmonies in the middle of the motive arise from incremental voice-leading transformations and do not convey a sense of harmonic progression or contrast *per se*, but rather serve as perturbations of a prolonged A♭ major tonic harmony.

“*Geduld*” thus exemplifies not only the range of harmonic transformations found in Strauss’s early works, but also their potential as a means of harmonic prolongation. In this song, harmonies that arise through voice leading transformations often do not function as harmonic entities in their own right within a tonality. Instead, they operate as
mutations of another, more structural harmony that undergoes some degree of
degeneration through the slight dislocation of one or more members of that harmony, but
always with at least the potential for subsequent reconstitution of the harmony through
the realignment of its pitches. Harmonic prolongation via voice leading transformations
is therefore analogous to the recognition in Shenkerian theory that structural pitches are
prolonged through embellishments or “diminutions” such as passing or neighboring
motion closer to the musical surface. And as with Shenkerian theory, it is possible to
identify such prolongations in “Geduld” at different structural levels, in this case
representing the increasing sense of delay and frustration expressed in the text as the
speaker’s patience wears thin and eventually runs out.

The distinction between transformational harmonic prolongation in this repertoire
and prolongation in Schenkerian theory generally is that the latter is a fundamentally
linear procedure and applies to harmony (either functional or non-functional) only at
deeper levels or only some of the time. In Schenkerian theory, for example, the neo-
Riemanian transformations L and R represented in progressions such as I – iii – I or I –
vi – I are described as tonic “expansions” that are ultimately tied to a diatonic linear
background. Transformational harmonic prolongations of the type explored in the
present analysis are a small but distinct subset of those acknowledged in Schenkerian
theory, but they serve to prolong a specific structural harmony that may or may not be
tied to a conventional fundamental structure.
Example 5.4. The simplified harmonic structure of the Geduld motive, with transformations.

This use of transformational harmony is a succinct encapsulation of the sense of delay experienced by the speaker, and it is just the first of many instances of this technique in “Geduld.” In fact, delay permeates the work and is primarily achieved through transformational means. These delays result in harmonic prolongations in the sense that the expected harmony is clearly implied, yet does not arrive at the expected time—precisely the case in Example 5.3. Although the prototypical delay embodied by the Geduld motive is of the tonic harmony, in the first two stanzas it is the dominant harmony that exhibits the delay through harmonic prolongation, as shown below.

Furthermore, these prolongations grow longer as the song progresses, in tandem with the speaker’s growing sense of impatience and resulting frustration.

Finally, while the Geduld motive contains the germ of the harmonic technique—prolongation through transformational means—that governs this work, it is also expressed in the large-scale structure of the song. This can be seen in Example 5.2,
where the first section begins and ends in Ab major. The second section also starts in Ab major and ends in Ab minor. The third section begins in Ab minor and finally ends in Ab major, expressing the harmonic structure of the *Geduld* motive across the span of the entire song, as shown in Example 5.5.

![Diagram of large-scale form of "Geduld"]

Example 5.5. The *Geduld* motive expressed in the large-scale tonal structure of the song.

5.4 First Prolongation of the Dominant, Measures 4-6

The first prolongation of the dominant occurs in the introduction, shown in Example 5.6. While it is only marginally transformational, its voice leading refers back to the *Geduld* motive, applying the same transformation to the same harmony. It begins in measure 4 as a cadential six-four, but rather than resolving directly to the dominant EbM, the second inversion AbM is transformed via P in its guise as MJ-0-MN to a second-inversion Abm in measure 5. The dominant arrives in measure 6, but only after a 4-3 suspension in the upper voice of the piano delays the arrival of the third of the triad. This dominant prolongation, while brief and fundamentally tonal, sets the stage for the
dominant prolongations to come. In spite of its brevity, it embodies a triple delay. First, the arrival on the cadential six-four rather than the dominant; second, the transformation of the second-inversion A♭M to A♭m; and finally the 4-3 suspension at the end of the prolongation. In this way, it is similar to the *Geduld* motive in that although the expected harmony is clear from the outset, its actual arrival is delayed until the last possible moment. This represents the source of frustration with delays that take place in everyday events. When the actual time an important event will take place is unknown, there is little frustration prior to its occurrence. If, however, there is an expectation that an event will occur at a specific time but is delayed, the normal reaction is a buildup of frustration.

Example 5.6. The first dominant prolongation, mm. 4-6.
5.5 Further Prolongation of the Dominant, Measures 10-13

In measures 10-13, shown in Example 5.7, the dominant is prolonged again, but rather than simply leading to a half cadence at the end of a phrase as in the previous example, the prolongation begins with a half cadence and then extends into the next phrase, ending just before the perfect authentic cadence in measure 14. Like the previous example, the prolongation begins with a cadential six-four, and the E♭M dominant harmony arrives at the half cadence in measure 10. However, instead of moving directly to the tonic harmony at the beginning of the next phrase, or even a dominant harmony, E♭M moves directly to CM via the CTT MJ-9-MN. CM is not diatonic in A♭ major, but it could function in that key as V/vi if it proceeded to Fm. This functional possibility is denied, however, and in the following measure, CM moves instead to Cm via MJ-0-MN, the P transformation, and then via the SCT MN-3-DM7 to E♭7 in measure 13 that functions as the dominant of A♭ major, finally leading to a perfect authentic cadence in measure 14. While MN-3-DM7 is not a Riemannian STT, it can be viewed as a version of R in its MN-3-MJ guise, but with the addition of a minor seventh on the major triad.
Example 5.7. The dominant prolongation in “Geduld,” mm. 10-13.

The harmonic movement from measures 10 to measure 13 is shown in Example 5.7 along with the transformations between the harmonies and their corresponding transformation vectors. There is no modulation or tonicization in the passage, and neither CM nor Cm serves a functional role in the key, yet these two harmonies are not jarring, and the prolongation of EbM is almost seamless; in fact, the passage never sounds as if it has ceased to be in A♭ major. One reason for this, of course, is its brevity: the CM and Cm harmonies only encompass two measures. Another reason is that although the transformational harmonies are not functional, the melody in measures 10-13 emphasizes the pitches of the dominant harmony: Eb, G, and B♭, as shown by the beamed notes in Example 5.8. This melodic emphasis of the pitches of the dominant harmony, even while
the interior measures of the passage are harmonized by consonant non-functional harmonies, imbues the passage with dominant function. While this is the first time that Strauss uses this technique in *Geduld*, it is not the last. Indeed, while an exact restatement of measures 10-13 occurs in measures 41-44, this instance of the technique is merely a template, serving as preparation for longer prolongations that exemplify in harmonic terms the increasing sense of delay felt by the speaker as the song progresses.

Example 5.8. A voice leading sketch of the dominant prolongation in mm 10-13. Beamed pitches outline the dominant harmony.

5.6 Longer Dominant Prolongation, Measures 15-23

An expansion of the previous example is seen in measures 15-23, shown in Example 5.9, where Strauss uses a similar technique for dominant prolongation, but this time encompassing an entire phrase. After the perfect authentic cadence in measure 14, a new phrase begins on Cm. As in the previous example, Cm is not employed functionally in A♭ major. Instead, this harmony is repeated with the same rhythm and no variation in
voicing or any other musical element for six measures, the length of the phrase. While
the upper and lower pitches of the melodic tessitura are C5 and C4, respectively, it is not
the root of the harmony that receives the melodic emphasis. Instead, the pitches that
receive the greatest emphasis are E♭ and G, the root and third of the dominant harmony,
as shown in Example 5.10. This, combined with the ending of the phrase in measure 15
on E♭ rather than on C, reinforces the dominant function of this passage, almost as if it
were really tonicizing E♭ major, but over a C minor harmony.

The seamlessness of the movement into and out of the phrase is enhanced by both
the melodic and harmonic motion. In measures 14-15, the melodic motion is simply from
the tonic, A♭, to G, the leading tone. The phrase beginning in measure 21 begins with
E♭, the same pitch that concludes the previous phrase. The harmonic movement is
similarly smooth. The movement from A♭M in measure 14 to Cm is via the Riemannian
STT MJ-4-MN, one of the guises of R. The move from Cm to the dominant, E♭7, in
measure 21 is accomplished through the SCT MN-3-DM7, which can be also be
understood as a version of the Riemannian STT L, but with the addition of a seventh on
the final harmony. As shown by the transformation vectors, this is the smoothest possible
movement into Cm, with only a half-step movement in a single pitch. The movement
from Cm to E♭7 is similarly smooth, although it involves the mapping of one pitch onto
two.
Example 5.9. Dominant prolongation, mm. 15-23.
Example 5.10. A voice leading sketch of the dominant prolongation in measures 15 to 23. Beamed pitches outline the dominant harmony.

5.7 Longer Prolongation of the Dominant, Measures 46-56

This process of dominant prolongation is extended further in measures 46 to 56, shown in Example 5.11. Here, Cm is finally tonicized in its own right, yet it still serves to prolong the dominant of A♭ major. The previous phrase ends on a perfect authentic cadence in A♭ major in measure 45, followed by movement directly to Cm at the start of the next phrase in measure 46. The tonicization of Cm is not immediately apparent, however, until the cadence in measure 53, since all of the harmonies that follow C minor are non-functional until measure 48, and even that D♭₆ harmony is only recognizable as a functional N₆ in retrospect as it moves to vii°₇/V and finally to a cadential six-four in C minor.
As shown by the transformation vectors in Example 5.12, the voice leading between the harmonies is extremely smooth. The salient feature of the first six measures is the contrary motion between the bass and many of the upper voices. This movement through nonfunctional harmonies, then chromatic functional harmonies, and finally diatonic functional harmonies in C minor features two voice exchanges, shown in the voice-leading sketch. The first is a chromatic voice exchange, between C and E♭ in measure 46 and E♭ and C♯ in measure 48. This voice exchange serves to express dominant function in A♭ major in two ways. First, all of the harmonies contain G, the leading tone of A♭ major, and it is this pitch that is emphasized in the vocal part and especially as the upper pitch in the piano part. The second way is that the final harmony participating in this voice exchange is a German augmented sixth chord that would normally be found in G minor. But this harmony is enharmonically equivalent to E♭7, the dominant of A♭ major. The second voice exchange is between E♭ and G, the root and third of the dominant, in measure 48 and G and E♭ in measure 51. While it is unusual for a voice exchange to conclude on an unstable six-four chord, the return of G as the emphasized pitch in the vocal part, combined with the fact that E♭ is not the actual dissonant interval above the bass in this harmony, confirms its significance. After the arrival of the cadential six-four, the approach to the C minor cadence is conventionally functional.

Like the previous example, the movement into and out of the passage is through a transformation from the Riemannian STT subgroup. In measures 45-46, this is through MJ-4-MN, a version of L. Likewise, the movement from Cm to the E♭M in measures 53-54 is by way of MN-3-MJ, a version of R. While this transformation is smooth from a
pitch space voice leading perspective, Strauss further enhances the smoothness in three ways. First, the root position Cm in measure 53 moves to first inversion, thereby prepositioning the root of the upcoming dominant harmony in A♭ major. Second, the movement from C to E♭ in the upper voice of the piano part is filled in by chromatic stepwise motion. Finally, the addition of the seventh to the dominant harmony in measure 54 does not occur until after the initial sounding of the harmony on the downbeat. In this passage, Strauss makes the movement from the tonicized Cm to the dominant of A♭ major as smooth and continuous as possible, thereby enhancing the prolongation of dominant function in A♭ major through a tonicization of Cm.
Example 5.11. Dominant prolongation via C minor in “Geduld,” measures 46-57.
Example 5.12. A voice-leading sketch of measures 45-57, with transformations. Beamed pitches outline the dominant harmony.
5.8 The Third Stanza

The process of prolongation through harmonic transformation culminates in the third stanza, along with the speaker’s frustration. Here, rather than simply prolonging the dominant function, the tonic function is prolonged as well, often using techniques similar to those in the earlier stanzas. The stanza begins with a short introduction using the Geduld motive, but in A♭ minor rather than A♭ major, followed by a modulation to B♭ minor in measure 79 that leads to an authentic cadence in measure 83. The text of this section is the first two lines of the third stanza. As shown in Example 5.1b, this stanza is more substantially different from the version of Geduld that Strauss did not choose than either of the previous two stanzas, and the differences make this version more personal and dramatically intense. They also make the resolution of the drama – the speaker’s rejection of patience and his subsequent decision to abandon his beloved – utterly final. It is in the first two lines of the this stanza that the speaker realizes that, in spite of his pleas, his happiness will be denied, at least for the time being, and further patience will be required of him by his beloved. The modulation to B♭ minor, while not a distantly related key of the home key of A♭ major, is distantly related to A♭ minor and sets in motion the series of tonic and dominant prolongations that follow.

The first prolongation is of the dominant function, shown in Example 5.13. Although it culminates in measure 87 with the arrival of G5 in the soprano, it begins with the transformational passage in measures 83-86. Here, any sense of a tonal center is lost amid the SSTs and cardinality transformations between the functional B♭m in measure 83 and the functional D7 in measure 86. With the exception of the first transformation,
the movement between the harmonies is smooth, as shown by their transformation vectors. Among the last three transformations, there is one SST with a single half-step motion and two cardinality transformations. Additionally, the harmonies within this passage are not unrelated to one another. The two minor triads, B♭m and F♯m, are members of the same hexatonic system. Likewise, the two major-minor seventh chords, B⁷ and D⁷, are members of the same OctaTowers. While the fact that the two minor triads are part of the same hexatonic system and the fact that the two major-minor seventh chords are part of the same OctaCycle is not especially relevant to this analysis, it is indicative of the transformational voice leading within this passage.

After the transformations of measures 84-86, the D⁷ resolves as a functional dominant seventh chord in G minor with the arrival of G5 in the soprano. Although G minor is not a functional harmony in either A♭ major or A♭ minor, its use as a dominant function in the home key of A♭ major is enhanced not only by the prominence of G as both the upper and lower melodic pitch in this passage, by the importance of B♭ as well. Additionally, the resolution of D⁷ measure 86 is ostensively to a G minor triad that contains a non-chord tone. Instead of a complete G minor triad, the harmony contains an E♭ that resolves to D in measure 88. While the E♭ is clearly an appogiatura at the surface.

105 Richard Cohn, “Maximally Smooth Cycles, Hexatonic Systems, and the Analysis of Late-Romantic Triadic Progressions,” *Music Analysis* Vol. 15, No. 1 (Mar., 1996): 17. The hexatonic systems are cycles of major and minor triads generated by maximally smooth movement between each triad. Each resulting triad is a member of set-class 3-11 [0, 3, 7] and the hexatonic systems are so-named because a complete pitch inventory of each cycle comprises set-class 6-20 [0, 1, 4, 5, 8, 9]. Specifically, B♭m and F♯m belong to Cohn’s southern hexatonic system, {1, 2, 5, 6, 9, 10}.

106 Jack Douthett and Peter Steinbach, “Parsimonious Graphs: A Study in Parsimony, Contextual Transformations, and Modes of Limited Transposition,” *Journal of Music Theory* Vol. 42, No. 2 (Autumn, 1998): 246. Douthett and Steinbach’s OctaTowers are similar to Cohn’s hexatonic systems in that they are generated through maximally smooth motion between seventh chords, although the resulting seventh chords are not all of the same set-class. The complete pitch inventory of an OctaCycle comprises an octatonic set {0, 1, 3, 4, 6, 7, 9, 11}. Unlike the hexatonic systems, the three OctaCycles are not given unique names but are instead known by their pitch content. The OctaCycle that contains B⁷ and D⁷ is {0, 2, 3, 5, 6, 8, 9, 11}.  

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level, it does not create a dissonance with either G or B♭. Instead, it can be heard as E♭ M, the dominant harmony of A♭ major/minor, which is then transformed to G minor via the STT MJ-4-MN, a version of L. Finally, the close relationship between G minor and E♭ major can be seen in the fact that they are both members of Cohn’s western hexatonic system. The triads contain two common tones, G and B♭, which feature prominently in the melody. In this way, the use of G minor as an expression of dominant function is an inversion of the process used in measures 15-20, where Cm is used as a substitute for E♭ M, thereby prolonging it. Rather than featuring the root and third of E♭ M within the context of C minor, in this instance it is the third and fifth of E♭ M that is featured, but within the context of G minor.
The dominant function expressed in measures 83-91 proceeds to the tonic function expressed simply through A♭m in measures 92-95, shown in Example 5.14a. While the use of the tonic triad is straightforward, the movement from G minor to A♭ minor is achieved through transformational means, shown in Example 5.14b. Here, Gm moves directly to an incomplete fully diminished seventh chord that could function as an enharmonic vii°7/ii. This potential harmonic function is not realized, however, as the fully diminished seventh chord resolves as a common tone diminished seventh to A♭m.

From a transformational perspective, the first of these, MN-7-FD7, as a compound cardinality transformation, should not be especially smooth, as shown by its transformation vector, Vt[1*, −2*, 1, 0]+. However, as the root and third of the A♭ minor triad move into place while the D remains as a common tone, the expected F does not appear anywhere in the texture. This movement to the tonic triad is completed in the following measure with FD7-6-MN, as the final pitch moves into place. Strauss employs transformations that are not very smooth and, by the omission of a single pitch in the fully diminished seventh chord, smoothes them out to a great extent, moving first two pitches and then the final pitch of A♭m into place, creating unexpectedly smooth motion between G minor and A♭ minor. It is as if the pitches are the tumblers in a lock, each slipping into their correct position as the correct combination is entered. The transformational use of this incomplete fully diminished seventh chord is confirmed when compared to the same harmony two measures later, where it is complete and functions as a true common tone diminished seventh.
Example 5.14. a. A voice-leading sketch of mm. 90-95; b. The transformations from G minor to A♭ minor.

In measures 96-98, shown in Example 5.15, tonic function gives way to dominant function. Again, this is straightforward with movement to the dominant harmony, briefly prolonged by a pedal six-four before returning to the dominant in measure 98.
Example 5.15. A voice-leading sketch of mm. 96-99.

The expression of tonic and dominant function in A♭ minor is short-lived, however, and instead of resolving to the tonic, two transformations effect a modulation to E major, as shown in Example 5.16. First, E♭M in measure 98 is transformed to E♭m via MJ-0-MN, or P. This is followed by a cardinality transformation, MN-3-MN7, which results in an F♯m7 that then functions as ii7 in E major, leading to V7 and then to I. The use of E major as an A♭ minor tonic substitute depends on understanding it as an enharmonic respelling of F♭M, which is an MN-8-MJ, or L, transformation of A♭m. Both triads share the root and third of A♭m, and Strauss emphasizes this fact, especially in the piano part, where an enharmonic A♭ is the highest pitch and where both the enharmonic A♭ and C♭ are doubled.
After these two short instances of the relative tonal stability of A♭ minor and E major, “Geduld” becomes its most tonally unstable, with virtually no functional connection between harmonies in favor of chord-to-chord transformations. But in spite of this, Strauss uses these transformations in conjunction with other facets of the musical texture in such a way that the alternation between tonic and dominant function is retained. This is first seen in measure 102, where F#7 first seems to be a borrowed ii7 in E major, an interpretation that is belied by the movement to F#7 in the following measure via STT HD7-0-FD7, or D1*. This initiates five measures, shown in Example 5.17, in which dominant function is expressed using only tenuous harmonic connections to A♭ minor as F#7 moves to CM followed by Cm, and finally to Eb7 in measure 107. The final chord of this passage is, of course, the dominant of A♭ minor, but this is not the
only way in which dominant function is expressed. The leading tone, G, features prominently as the highest pitch in the melody, along with Eb as the starting and ending pitch in this passage. Furthermore, the Cm - CM - Eb7 progression is identical to the earlier dominant prolongation in measures 11-13, shown in Example 4.8, and measures 42-44.
Example 5.17. A voice-leading sketch of mm. 101-108.
The final tonic prolongation is shown in Example 5.18. It begins in measure 108 and comprises the remainder of the song. This section, the most tonally unstable part of the entire work, embodies the speaker’s frustration. Up to this point in the song, each word of the text is articulated without repetition and the end of the final line of the text arrives in measure 108. After this point, the text consists of repetitions of words or phrases from the final line, an example of delay projected into yet another aspect of the song. The melody itself is simple, consisting at the middleground level of a nearly-complete chromatic descent from E♭ to A♭, symbolizing the speaker’s despair and defeat, with the only exception being the final stepwise motion from B♭ to A♭ in measures 113-115. The tonic function is reinforced by the predominance of A♭ in the outer voices of the texture, as well as the arpeggiation of A♭ and E♭ in the bass in measures 108, 111, and 114, and the arpeggiation of A♭ alone in measure 117. The harmonies are for the most part unrelated to the key of A♭ major or minor, and almost none are used functionally, except for the A♭ major triads in measure 119 and the following measures. Instead, they consist principally of smooth transformations among triads and seventh chords. Indeed, among the twenty-seven transformations that occur between measure 102 and measure 119 and shown in Table 5.1, twenty are the smoothest type of transformation possible of their types: either STT, SST, or CST. The fourteen STTs and SSTs involve the mapping of a single pitch onto another while the six cardinality transformations involve the bifurcation of one pitch, mapping it onto itself and another pitch, or the reverse of this process. The remaining seven transformations are compound transformations representing all three types: CTTs, CSTs, and CCTs. In spite of this, there are no transformations that are completely disjunct. Each preserves at least one
pitch between the two chords, and with the exception of the MN-7-MN transformation between A♭m and E♭m in measures 112-113, the preserved pitch is always A♭.
Example 5.18.  a. A voice leading sketch of m. 109-124; b. The transformations in mm. 109-120.
Table 5.1. The types of transformations in mm. 102-119.

The chord-to-chord voice leading is completely stepwise and descending in the upper piano part starting in measure 104 and continuing to measure 120. The left hand is similar, with the exception of the arpeggiations mentioned above. This descending stepwise voice leading is reminiscent of the simple vocal line and helps reinforce the elements of resignation and defeat expressed in the text.

Although the vocal line reaches the final A♭ in measure 115, it is not supported by A♭M until measure 119, which initiates an overlapping four-chord pattern that is repeated three times, with the final chord of one pattern acting as the first chord of the next pattern. The chords, shown in Example 5.19a, are A♭M, B♭m7, B♭7, and A♭M. While the transformations from each chord to the next are all compound transformations, A♭ is preserved throughout. Furthermore, this pattern can be seen as an expansion of the Geduld motive, as shown in Example 5.19b. The bass is identical and the upper parts are merely inverted, with an expansion of the (C) - B - C motion in the Geduld motive to C - B♭ - B - C. The pattern repeats three times and although it acts as a tonic prolongation, the actual tonic triad is metrically weak and is of a shorter duration than the other two chords, again symbolic of the delay that characterizes the song and that forms the basis of the speaker’s discontent and frustration. Even when the final tonic triad is reached at the
conclusion of the final four-chord pattern in measure 122, it is metrically weak and proceeds to passing motion rising to the final tonic triad of the piece. While it is strong and sounds for two measures, even this final instance of the tonic harmony is marked by delay with an appoggiatura from B♭ to A♭, perhaps indicative of the never-realized final perfect authentic cadence.

a.

![Example 5.19](image1.png)

b.

![Example 5.19](image2.png)

Example 5.19. a. The four-chord pattern in measures 119-120: A♭M, B♭m⁷, B♭⁷, and A♭M; b. The relationship between the *Geduld* motive and the four chord pattern in mm. 119-120.
The completion of the vocal part also serves to illustrate the dramatic content of
the third stanza. The repetition of individual words and phrases of the final line,
mentioned above, brings the sense of delay into another component of the work: the text
itself. Likewise, the arrival of the vocal line on its final A♭ in measure 115 prior to the
arrival of A♭M in measure 119 is indicative of the speaker’s sense of impatience and his
resulting frustration. The fact that the vocal part ends in measure 120, just as the four-
chord pattern is beginning, is similar. Even though the music continues to urge him to
wait, he has made good on his threat to his beloved: he has left, never to return.

5.9 Summary

In “Geduld,” Strauss uses harmonic transformation in conjunction with other
techniques to illustrate the dramatic narrative content of the text. While these triadic,
seventh chord, and cardinality transformations are not solely responsible for the tightly
constructed nature of the work, they do permeate it at all structural levels, from chord-to-
chord connections, motives, prolongations of varying durations, and even the tonal
structure of the work. Moreover, the transformations are integrated with chord voicings
and melodic lines that emphasize important pitches and also illustrate the dramatic
concepts of the narrative, all while maintaining a sense of tonality in a harmonic
environment that is at times devoid of functional harmonic relationships, especially in the
third stanza.
Chapter Six: Conclusion

The music of Richard Strauss’s first compositional period is relatively unknown today. In general, these works are eclipsed by the large orchestral works that followed the first period, such as the tone poems that begin with Aus Italien in 1886 and especially the operas, most notably Salome and Elektra. One reason for this is that many of the first period works are juvenilia written by the composer when he was a child as young as five or six years old and others are clearly compositions undertaken by the fledgling composer as part of his compositional studies. Even so, by the end of the first period the compositions of the late-teenage composer begin to take on a distinctive voice of their own. Not yet a completely unique voice – one of Strauss’s many talents is his ability to effortlessly absorb facets of other composers’ techniques and integrate them into his own, and he exhibits this throughout his long compositional career – but one that nevertheless points toward one of the characteristics for which he is known in the music composed after 1885: a penchant for adventurous harmonic experimentation.

Strauss’s mastery of compositional technique, combined with the fact that his prolific compositional habits and considerable work ethic emerged in his childhood, leaves a significant body of compositions, many of which are worthy of study. Among these works are overtures, marches, and serenades for orchestra, plus Strauss’s only two
symphonies. There is a serenade and a suite written for wind instruments, unaccompanied choral works, plus works for chorus and orchestra. Chamber works include a string quartet, two piano trios, and a piano quintet. There are sonatas for violin, for cello, and other works for solo instruments. For piano he composed three sonatas, plus waltzes, polkas, fugues, and sonatinas. Finally, there are dozens of songs, including two sets of eight and five songs.

In spite of Strauss’s harmonic adventurousness, all of these first period works are fundamentally tonal. Without exception they are organized around a single tonic key, although they frequently employ other keys that are always subordinate to the tonic. The harmonic language of these works is functional, with diatonic harmonies that are organized hierarchically and that exhibit goal-directed harmonic motion toward the tonic. Chromatic harmonies are also common in the first period works, and they typically function within the syntactical hierarchy, usually acting as substitutes for diatonic harmonies.

Within this essentially tonal framework, however, are passages in which the norms of functional tonality do not obtain, but which are not simply linear or sequential progressions, and which require different analytical methods from those based on the routines of functional tonal harmony. These passages frequently feature the retention of common tones and incremental voice leading between harmonies, suggesting a transformational approach as the most appropriate method of investigation.

Neo-Riemannian set-theoretic approaches are often used to analyze non-functional passages such as those described above, but they are sometimes limited in that they recognize only major and minor triads, since they are members of the same set-class,
3-11. When seventh chords are considered in a neo-Riemannian approach, they are often similarly restricted to the major-minor and the half-diminished seventh, both members of set-class 4-27. This study differs from the neo-Riemannian approach in that it views transformation in a purely harmonic light: the four types of triads and five types of seventh chords commonly used by Strauss – major, minor, diminished, and augmented triads, and major, major-minor, minor, half-diminished, and fully-diminished sevenths – are included in this system of harmonic transformation. The most basic type of transformation between two harmonies of the same cardinality is one in which only one pitch maps onto a different pitch and all other pitches map onto themselves, known as either simple triadic transformations (STTs) or simple seventh chord transformations (SSTs). Additionally, non-functional passages that include movement between triads and seventh chords are also common in Strauss’s first period music. Accordingly, a class of cardinality transformations is introduced in this study to accommodate this type of harmonic motion. And like the STTs and SSTs, the salient feature of simple cardinality transformations (SCTs) is that they share maximal common tones between the triad and the seventh chord. They differ, however, in that SCTs can share either three or two pitches between the triad and seventh chord, depending on whether one pitch from the triad maps onto itself and a different pitch through furcation or instead maps onto two different pitches through bifurcation. Finally, all three types of transformations previously mentioned – triadic, seventh, and cardinality – can be expanded to compound transformations so that fewer common tones are retained between the harmonies.

All of the STTs and SSTs in this expanded system are assigned abbreviations that are derived from the P, L, and R transformations of neo-Riemannian theory. However,
each of these abbreviations designates two distinct harmonic transformations. For example, P can specify a transformation from a major triad to a minor triad with the same root or the opposite. To clarify this situation, this study introduces unique transformation names that indicate the qualities of the starting and ending harmonies, as well as the directed motion between their roots. Finally, each transformation, regardless of type, is also accompanied by a transformation vector, a compact description of the movement of each member of the first harmony in the transformation.

This system of harmonic transformation yields a comparatively large number of possibilities, nearly all of which are used in Strauss’s first period works as demonstrated by the examples cited in Chapter Two to Chapter Four. Furthermore, these are not merely instances of transient harmonies of little import in the greater musical context. Rather, they are often used for specific purposes, such as to achieve a modulation, prolong a harmony, or even for motivic reasons. This approach to transformational harmony is not intended to discount or replace earlier theoretical models, but rather is presented here as a means of elucidating harmonic practice in a specific repertoire. It nevertheless has the potential to augment or inform analyses of a broader range of works by various composers of the late nineteenth and early twentieth centuries. This analytical apparatus should also be understood as one that does not stand in opposition to, but instead co-exists with, Schenkerian theories of voice-leading structure as well as functional tonal theory. The relevance of such multi-faceted analysis for understanding this music brings to light an important aspect of Strauss’s early development as a composer, and his ability to integrate transformational techniques with harmonic and voice leading procedures inherited from established practice.
The final analysis of this study encompasses an entire work, the song “Geduld,” in which all types of transformations explored in the previous chapters are integrated into all levels of the composition, from that of the motive, to the phrase level, and ultimately to the tonal structure, all while expressing the dramatic content of the text in harmonic terms. And although few of Strauss’s pre-tone poem works contain this degree of transformational harmonic saturation, nearly all of them, regardless of genre, employ at least some of these techniques. It is an especially remarkable achievement for a nineteen-year-old composer and is a harbinger of Strauss’s increasingly more complex harmonic language to come in the works after 1885. Even so, in spite of the fact that the compositions of this period would later be eclipsed by the tone poems and operas, it is the harmonic language of works like “Geduld” that first elevated Strauss to a position of prominence among the European musical establishment of his time.
Appendix A: Strauss’s First Period Works

The names of Strauss’s first period works are grouped according to genre below, along with their identifying catalog numbers, as well as opus numbers if applicable. A question mark next to the year of composition indicates that the exact composition date is not known.

**Other Dramatic Works**

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**Orchestral Works**

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<td><em>Concertouvertüre</em></td>
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<td><em>Lied ohne Worte</em></td>
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Orchestral Works with Soloists

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Brass and Wind

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Choral with Orchestra

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Unaccompanied Chorus

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<td>Kyrie, Sanctus, Benedictus, Agnus Dei</td>
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Solo Voice and Piano

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<td>“Spielmann und Zither”</td>
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**Voice and Orchestra**

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**Other Vocal Works**

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— — 1876 “Four scenes for a Singspiel” (doubtful attribution)
64 — 1878 “Ein Alphorn hör' ich schallen”

**Chamber and Solo Instrumental**

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<td>Introduction, Theme and Variations</td>
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<td>Piano Trio No.2</td>
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<td>Variationen über eine Tanzweise von Cesare Negri</td>
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**Piano**

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### Studies and Exercises

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### Arrangements

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Appendix B: Strauss’s Works Cited in this Study

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Appendix C: Simple Cardinality Transformations

All simple cardinality transformations are shown below, starting from CM, Cm, C⁰, and C+ triads. Preserved pitches are shown as open note heads and the preserved intervals are shown to the right of each staff. The reciprocal transformations from seventh chords are not depicted, but can be derived from the transformations below.

SCTS from a Major Triad

starting triad

major triad

furcations

MJ–0–MJ₇
[-1*, 0*, 0, 0]+

MJ–0–DM₇
[-2*, 0*, 0, 0]+

MJ–9–MN₇
[0, 0, 0*, 2*]+

bifurcations

MJ–6–HD₇
[0, 0, –1*, 2*]+

MJ–5–MJ₇
[0, 0, –2*, 2*]+

MJ–1–HD₇
[-1*, 1*, 0, 0]+

MJ–1–FD₇
[-2*, 1*, 0, 0]+

MJ–4–MN₇
[–1*, 2*, 0, 0]+

MJ–4–HD₇
[–2*, 2*, 0, 0]+
SCTs from a Minor Triad

starting triad

furcations

bifurcations

SCTs from a Diminished Triad

starting triad

furcations

bifurcations
SCTs From a Diminished Triad

Starting Triad:

![starting triad](image1.png)

Augmented Triad:

![augmented triad](image2.png)

Furcations:

NONE

Bifurcations:

MU-9-MN7 [0, 0, -1*, 1*]
MU-0-DM7 [0, 0, -1*, 2*]
MU-6-HD7 [0, 0, -2*, 1*]

MU-1-MN7 [-1*, 1*, 0, 0]*
MU-4-DM7 [-1*, 2*, 0, 0]*
MU-10-HD7 [-2*, 1*, 0, 0]*

MU-5-MN7 [0, -1*, 1*, 0]*
MU-8-DM7 [0, -1*, 2*, 0]*
MU-2-HD7 [0, -2*, 1*, 0]*

![bifurcations](image3.png)
Bibliography


