Symmetrical Elements in the Piano Music of Einojuhani Rautavaara

by

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A thesis submitted in conformity with the requirements for the degree of Doctor of Musical Arts

Faculty of Music
University of Toronto

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2018

Abstract

Einojuhani Rautavaara (1928 – 2016) is regarded as one of the most internationally successful composers from Finland since Jean Sibelius. He is widely known for his pluralistic compositions that do not follow a linear progression of stylistic development and that exhibit a synthesis of seemingly contradictory compositional styles in his mature works. Despite the rapid changes of styles, Rautavaara retains certain characteristics that set his music apart from that of others. One of these elements that remained consistent throughout his career is his fascination with symmetry. From the Three Symmetrical Preludes during his student years to his late piano miniatures, symmetrical compositional tools such as the bilateral keyboard symmetry remained a key component in his piano works.

Although Rautavaara’s piano output is small compared to other genres, it is scattered throughout various stylistic periods in his life, making it possible to observe the similarities and changes in his writing. The goal of this research is to observe and study how the composer developed and utilized symmetry in his compositions through analysis of selected solo piano works from the early to the late period. As the research centers on symmetry, the works chosen for analysis will be the ones that contain significant amounts of symmetrical writings, namely the Three Symmetrical Preludes (1949–50), selections from Etudes (1969), Piano Sonata No. 1 (1969),
Narcissus (2001), and Mirroring (2014). This research also provides an opportunity to study Rautavaara’s lesser-known piano works, as well as providing a first look at Mirroring, his very last work for solo piano. The concluding chapter considers the symbolisms in symmetry as well as interpretive choices and pedagogical merits of symmetrical structures in Rautavaara’s solo piano music.
Dedicated to my late grandmother, Xuanji Huang. She inspired me to pursue knowledge and truth in spite of skepticisms and consequences.
Acknowledgments

I wish to thank my doctoral committee members, Dr. James Parker, Prof. Camille Watts, Prof. Marietta Orlov, and external examiner Dr. Corey Hamm for their time and support in the review process. I also want to especially thank the head of my doctorate committee, Dr. Ryan McClelland, for his endless patience throughout the whole process of this research. I was only able to complete this project through his tireless efforts in helping me achieve high quality of scholarship. I would also like to extend my deepest gratitude toward my piano instructor Prof. Marietta Orlov. I have learned so much from her in the past six years that it was through her teaching that I finally felt physically and mentally at ease at the piano and found the confidence that I desperately needed in all these years of mastering my craft as a pianist.

I would also like to acknowledge all the mentors and teachers that have made significant impacts in my life as a musician. There are far too many to name here, but just to list a few: Ms. Sheila Hardy, Dr. Sara Davis Buechner, Prof. Emile Naoumoff, Prof. Lee Kum Sing, and Mr. Peter Longworth.

Lastly, I give my thanks to my parents and my wife for their continuous love and support throughout the lengthy process of my doctoral studies.
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Introduction

Purpose of Research

Although the number of compositions for the piano is relatively small in Finnish composer Einojuhani Rautavaara’s overall output, they are by no means unimportant. Among the composer’s best known works is the second piano sonata, titled *Fire Sermon* (*Tulisaarna* in Finnish). The title is sufficiently recognized in Finnish musical circles that it was borrowed for the composer’s latest Finnish language biography in 2014, written by Samuli Tiikkaja. Numerous articles and papers have already discussed this particular work in great detail, but it was only within the last ten years that the composer’s other solo piano works were studied and analyzed in more depth in English publications. As the composer finished his last piano piece, *Mirroring*, in 2014, an update to the existing literature seems necessary.

Rautavaara is well known for very drastic and sudden stylistic changes throughout his life. In some cases, the change can occur as close as between two consecutively written works. However, there are certain characteristics that carry across different genres. Symmetry, and particularly, bilateral keyboard symmetry is an important trait in Rautavaara’s compositions, even in his non-piano works. However, as of now there has only been one short article dedicated to the aspect of symmetry in Rautavaara’s work. While symmetry was acknowledged in two other dissertations on the composer’s piano works, it was not studied extensively, as the main concern was a more general study of intertextuality between different works. This paper will attempt to fill this gap by discussing selected works for solo piano ranging from one of the earliest compositions written during the composer’s student years to the last work through the perspective of symmetrical writing.

Following an overview of Rautavaara’s works in *Chapter 1*, there will be a brief overview of symmetry in Western music from tonal to post-tonal styles in *Chapter 2*. Since pitch symmetry is more relevant in Rautavaara’s music than structural symmetry, there will be a more focused discussion of the former type. The chapter will also look at post-tonal composers and compositional styles that have significant influences on Rautavaara, as well as introduce bilateral keyboard symmetry.
Within Rautavaara’s oeuvre of piano compositions, the selected pieces to be studied in Chapters 3-5 are specifically chosen for their significant symmetrical properties. They are as follows:

Neo-Classical Period (student years):
1. *Three Symmetrical Preludes* (1949-50)

Neo-Romantic Period:
1. Three movements from *Etudes* (1969)

Late Works:
1. *Narcissus* (2001)

The chosen examples above are, of course, not the only examples that contain symmetrical writing among Rautavaara’s piano works. The “Fire Sermon” Sonata, for example, has been so popular, that there have already been many thorough analyses of the piece. By comparison, the *Etudes* and *Piano Sonata No. 1* from the same period receive relatively little attention. *Three Symmetrical Preludes* is one of Rautavaara’s first published compositions, and it is the first and the only work that exploits strict simultaneous keyboard mirroring. At this point, no analysis of this set exists in any English publication. It may be an early experimental student composition, but it is a crucial piece to analyze for the topic of symmetry. Finally, *Narcissus* and *Mirroring* are among the composer’s last four piano miniatures that that are more significant in terms of the usage of symmetry. While *Narcissus* has been discussed already in two dissertations, the author feels it is necessary to further explore the symmetry in this work and put it side-by-side with *Mirroring*, which itself will receive an analysis for the first time in this paper.

This is by no means a complete and exhaustive theoretical analysis of symmetry in these selected works, but more of an observation from the point of view of a performer. The last chapter of this thesis will also contain a discussion on performance aspects and pedagogical suggestions on Rautavaara’s piano works in general, as well as the relationship between symmetry and technical developments between the hands.
Research Literature

The connection between symmetry and Western music has been well documented and studied, particularly in the twentieth century, when the goal-oriented, linear tonal system no longer poses a restriction to the mathematical mirror properties of symmetry. Articles that provide a good summary of the types of symmetry applied in music include the Croatian composer Davorin Kempf’s 1996 article titled, “What is Symmetry in Music.” There is also an essay from a more scientific perspective by Roberto Donnini in the *Computers & Mathematics with Applications* journal from 1986 titled, “The Visualization of Music: Symmetry and Asymmetry.” Notable writings on symmetry in post-tonal music include various essays by music theorist George Perle as well as his book *Twelve Tone Tonality*. Other useful sources focus on specific composers or compositions, including Perle’s articles on Bartók’s string quartets, where he first explored the concept of inversional symmetry. Richard Cohn follows up on this idea in his article, “Inversional Symmetry and Transpositional Combination in Bartók,” where he expanded Perle’s idea into other works such as the *Sonata for Two Pianos and Percussion* and selected movements from *Mikrokosmos*. The music of Claude Debussy and Olivier Messiaen also had an impact on Rautavaara’s compositional language, and both composers have examples of symmetry using modal scales. Cynthia Miller’s dissertation, *Parallelism and Symmetry in Three Debussy Preludes* (2000), had an in depth analysis of symmetrical writing in *Le vent dans la plaine, Les sons et les parfums tournent dans l’air du soir*, and *Des pas sur la neige*. Though it is more of a reorganization and rebranding of existing definitions of pitch symmetry than something completely new, Miller’s definitions of ordered and unordered pitch symmetry as well as registral symmetry are very helpful tools in analyzing Rautavaara’s music. Finally, Siglind Bruhn’s 2007 book, *Messiaen's Contemplations of Covenant and Incarnation*, explores the symbolism of the Catholic faith in the symmetry found in Messiaen’s works and reveals possible parallelism to the somewhat mystical quality in Rautavaara’s work, particularly on the interpretations of the titles that he used to label some of his works.

One difficulty in researching Rautavaara’s music lies in the significant number of sources in Finnish, although most of these sources focus on biography rather than music analysis. The most significant Finnish source is Rautavaara’s 1989 autobiography *Omakuva*. Nevertheless, there is a sizable growing body of articles and books written in English, including some by the composer himself. There are also a large number of transcripts available from various English-language
interviews Rautavaara did during his lifetime. Due to the fact that Rautavaara’s more celebrated outputs are his larger works, such as his operas and symphonies, many of the existing studies tend to focus on analysis of his larger ensemble works.

The most significant source that discusses Rautavaara and keyboard symmetry is Brandon Paul’s 2008 article “Bilateral Keyboard Symmetry in the Music of Einojuhani Rautavaara”. The article, though brief, offers a very useful graphic notation method to illustrate various examples of keyboard symmetries used in a number of Rautavaara’s piano works as well as other works such as the Cello Sonata No. 1 and Ballad for Harp and Strings. The musicologist Anne Sivuoja-Gunaratnam has written extensively on Rautavaara. In her 1999 essay, “Narcissus Musicus” or an Intertextual Perspective on the Oeuvre of Einojuhani Rautavaara, she suggests that the traditional chronological approach does not fit well when describing Rautavaara’s music, as the composer does not follow the evolutionary process of stylistic maturity, and instead advocates an intertextual approach of comparing different pieces from different stylistic periods. Although her 1997 doctoral thesis, focuses on the first serial period (1957-1965) when the composer did not write any piano works, the book is still important as it discusses the influence of the Finnish cultural and musical tradition to Rautavaara, and, in turn, how the composer’s outputs became the Finnish modernist movement itself.

There are a few dissertations that concentrate on Rautavaara’s solo piano works. The earliest of these was written in 1982 by Eric Tawaststjerna, titled Finnish Piano Music Since 1945. Tawaststjerna’s paper discusses a variety of contemporary Finnish composers at the time and dedicates a chapter on Rautavaara, in which he concentrates on the analysis of Piano Sonata No. 2 (Fire Sermon), but also includes a biography as well as a discussion of the various musical styles of the composer. Kimberly Scott and Lotta Matambo published their theses in 2009 and 2010 respectively. They both provide a broader discussion of the composer’s solo piano works from his earliest works up until 2007. Scott’s dissertation, Unity and Pluralism: A Stylistic Survey of the Compositional Techniques of Einojuhani Rautavaara as Reflected in Selected Works for the Piano, adapts Sivuoja-Gunaratnam’s intertextual approach and includes a chapter dedicated to Rautavaara’s recurring compositional techniques with excerpts drawn from various works from different periods. Scott also discussed the aspect of symmetry in her paper, which is tremendously helpful in this research. Since her topic concerns more on the unity of various recurring characteristics in Rautavaara’s piano works, symmetry is but one of many
characteristics discussed. Matambo’s thesis, *The Solo Piano Music of Einojuhani Rautavaara*, is a more traditional chronological approach that divides the composer’s output in stylistic periods and discusses the piano works that are representative of each period. Matambo also spent a significant portion of her paper discussing symmetry in Rautavaara’s work. The connection she drew between the palindromic ostinato motive in Rautavaara’s music and Bulgarian folk music (and subsequently, Bartók’s works) is particularly important. Many of the findings in this paper can be considered a continuation of the symmetry portions of both Scott and Matambo’s paper.

Finally, there is one book that explores the mystical side of Rautavaara’s music through the discussion of the topic of angels, which Rautavaara attributed as a title in a number of his compositions. Wojciech Stępień’s 2011 book, *The Sound of Finnish Angels*, discusses the angelic references in five instrumental compositions by Rautavaara in the context of angelic symbolisms in music since the time of Gregorian chant. This book also contains a chapter that surveys two opposing viewpoints, namely the claim for extra-musical representation as established from Plato, Renaissance Madrigals, and Baroque study of affects versus the nineteenth-century Romantic concept of music as an autonomous and absolute art form. Through the discussion of symbolisms, Stępień examines Rautavaara’s philosophy as a composer, as well as his aesthetic of the double that is strikingly similar to Bruhn’s interpretation of Messiaen’s sound universe, where symmetry is a significant trait shared between their music.
Chapter 1
Einojuhani Rautavaara: Life and Works

1.1 Biography

Apart from being a professor, writer, and music critic, Einojuhani Rautavaara (1928 – 2016) is considered one of the most internationally celebrated Finnish composers after Jean Sibelius. Throughout Rautavaara’s prolific compositional career, he wrote hundreds of large- and small-scale works, including eight symphonies, nine operas, fourteen concertos for various solo instruments, and many other works for chamber ensemble and for choir. Although he suffered from a serious health issue in 2004, Rautavaara slowly recovered and remained actively composing until he passed away in the summer of 2016.

Born in Helsinki in 1928 as Eino Juhani, Rautavaara was brought up in a musical family, which includes the award-winning cellist Pentti Rautawaara and the internationally renowned soprano, Aulikki Rautawaara. His father, Eino Alfred Rautavaara, was also an opera singer as well as the cantor at a Lutheran parish. Despite the strong presence of music in his family, Rautavaara was not encouraged to pursue music early in his life. He undertook piano lessons with his aunt and various other teachers, but the progress was slow since the lessons were sporadic. The Second World War as well as the death of both of his parents further hindered his musical education. It was not until he turned seventeen that Rautavaara’s piano lessons resumed with regularity, when he started lessons with Astrid Joutseno. He rapidly progressed in his musical training and started to compose. Before graduating from high school, he won first prize at the Teinien sävellyskilpailu (Youth Composition Competition) in 1947 with a short piano piece titled La première neige.²

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¹ Biographical information is primarily drawn from Tawaststjerna (1984), Heiniö (1988), and Scott (2009). Other important sources in Rautavaara’s life including the composer’s own autobiography, Omakuva (1989), Hakko Pekka’s Unien Lehja (2000), and Samuli Tiikkaja’s Tulisaarna (2014) are also considered but not comprehensively due to the fact that they have not been translated into English.

² This work was never published and was long thought to be lost until the composer’s latest biographer, Samuli Tiikkaja, rediscovered the manuscript during his research.
Rautavaara entered the University of Helsinki as well as the Sibelius Academy in 1948, where he studied with the influential Aarre Merikanto. Several important works were written during Rautavaara’s university years, including the first string quartet, *Three Symmetrical Preludes* for piano, and *Pelimannit* (The Fiddlers) suite for piano. The first major breakthrough for Rautavaara came in 1953, the same year the composer completed his master’s degree in musicology, when *A Requiem in Our Time* for brass ensemble and percussion gained widespread recognition. It is this work that won Rautavaara first prize at the Thor Johnson Brass Composition Competition in Cincinnati in 1954. In the following year, the ninety-year-old Jean Sibelius handpicked Rautavaara to receive the Serge Koussevitzky Foundation Fellowship, a grant that enabled the young composer to study at the Juilliard School from 1955 to 1956. Rautavaara himself stated that his time in the United States was very important in developing his compositional technique. His teacher at Juilliard, Vincent Persichetti, was in the process of writing *Twentieth-Century Harmony* at the time, and Rautavaara as well as his classmates were among the first composition students to practice the exercises in the textbook. In 1956, he had the opportunity to participate in Tanglewood, where he had lessons with Roger Sessions and Aaron Copland.

Rautavaara developed a growing interest in twelve-tone technique and serialism through his studies in United States. However, he felt that he was unable to receive thorough training in this technique via his American teachers. Upon his return to Helsinki and receipt of his composition diploma from the Sibelius Academy in 1957, Rautavaara sank into a compositional crisis. Although he was able to complete his first symphony (1956) during his studies at Juilliard, he felt that he struggled with writing large-scale works. Rautavaara realized that the twelve-tone

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3 Aarre Merikanto (1893-1958): Finnish composer and professor at the Sibelius Academy from 1936 – 1951. He was greatly influenced by the music of Alexander Scriabin during his student years and his music retained the highly chromatic and modernist elements during the time when his colleagues in Finland still worked exclusively in tonal idiom. He taught many Finnish composers born between the world wars and his neoclassical-styled compositions were highly influential among the works of his students. (Räihälä)

4 Vincent Persichetti (1915-1987): American composer, pianist, and educator. His music is often characterized by “lucid textures, sparse gestures, epigrammatic forms, a fondness for pandiatonic and polytonal harmony, a playful rhythmic vitality and a pervasive geniality of spirit” (Simmons). He had written a sizable collection of works for solo piano and had experimented with mirror symmetry writing (more in Chapter 2).

technique was the answer and felt that he needed more training in it. He decided to head to Ascona, Switzerland, to study with Wladimir Vogel. The following year, he headed to Cologne to study with Rudolf Petzold and attended a summer course in Darmstadt, which at the time was presented by Stockhausen and Nono. Rautavaara’s confidence as a composer grew, and both Vogel and Petzold taught the young composer the necessary skills he wanted for composing serial music. Rautavaara fully embraced Darmstadt-styled serialism during this first serial period, and composed seventeen compositions.

Despite the success of many of the works during this dodecaphonic period, Rautavaara felt the need to depart from serialism after nearly a decade. His works then returned to tonality around 1967 and entered into what Mikko Heiniö called a neo-Romantic and pluralist phase. By this time, he received a teaching position at the Sibelius Academy, a position he held until 1990. As a prolific writer, he also worked as a music critic for the Helsinki Ilta-Sanomat newspaper from 1963 to 1967. The composer’s literary skill allowed him to write his own libretto for all of his operatic output, starting as early as 1957 with _Kaivos_ (The Mine). Many important piano works were written during Rautavaara’s neo-Romantic period, including his two piano sonatas, _Etydit_ (Etudes), and the first piano concerto. By the late 1970s, Rautavaara’s popularity both in and outside of Finland had grown to an extent that his works were frequently featured in both live and radio performances. From 1975 to 1983, Rautavaara even had his own radio show on the Finnish Yleisradio station, which further spread his popularity in Finland.

Rautavaara’s prolific output eventually led him to stop assigning opus numbers to his works toward the end of the 1970s, as the composer had well over a hundred works at the time and did not want to be viewed as an “assembly-line Vielschreiber”. Due to his increasing popularity,

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6 Wladimir Vogel (1896-1984): Swiss composer of Russian and German descent. His early compositions were influenced by Scriabin and Busoni, and he was also involved with the Expressionist movement when he studied in Berlin. He fled to Switzerland from the Nazi regime in 1933, where he remained for the rest of his life and taught composition privately. He adopted the twelve-tone technique in 1937 with his _Violin Concerto_. He was a great admirer of Alban Berg’s music and preferred to avoid harsh dissonant harmonies in his utilization of the technique. (Ibid.)

7 Ibid., pp. 17, 41.

8 Heiniö, p. 12.

9 Ibid., p. 9.
there were an increasing number of music festivals outside of Finland that featured Rautavaara’s music during the 1980s and 1990s, and a vast number of large-scale works were written during this time, including the celebrated operas *Vincent* and *The Gift of the Magi*, as well as symphonies five through eight. In 1998, pianist Vladimir Ashkenazy commissioned the composer to write the third piano concerto.

Rautavaara’s prolific output was temporarily stopped in 2004 when he suffered a serious illness. Fortunately, he was able to recover, albeit slowly, and continued to compose. Since his comeback, he orchestrated his piano suite *Ikonit* (1955) in 2005 (retitled *Beyond the Icons*), and wrote large works such as *A Tapestry of Life* (2007) for orchestra and *Canto V – Into the Heart of Light* (2011) for string orchestra. In the final years of his life, he completed a song-cycle titled *Rubáiyát* in 2014, *Mirroring* for solo piano for the 4th Hong Kong Piano Competition in the same year,\(^\text{10}\) as well as *Fantasia* for violin and orchestra in 2015.

### 1.2 Rautavaara’s Music

Due to the fact that Finland is situated at the edge of Europe, it is not surprising that the cultural trends in Finland have often been behind those of the rest of continental Europe. The first wave of modernism (expressionism, impressionism, and neoclassicism) was brought to Finland during the 1920s. This cultural exchange was violently cut-off during the war years, and it was not resumed until the 1950s. The sense of new beginnings after the war as well as the desire to catch up to the rest of the European continent created an unusual cultural sphere where everything occurred in a compressed manner. Elsewhere in Europe, the development of modernism from Schoenberg to Darmstadt serialism, John Cage’s indeterminacies, and Edgard Varèse’s electronic music took roughly thirty years; in Finland, the entire process took only a decade, and they were able to catch up with mainstream Europe during the 1960s.

The Finnish composer and conductor, Esa-Pekka Salonen, had Rautavaara as his first composition teacher during his student years. He described Rautavaara as having “gone through

\(^{10}\) The competition was rescheduled to 2016 due to political unrest in Hong Kong during the “Umbrella Movement”.
a huge variety of musical styles and identities, and yet never lost his personality.”¹¹ Rautavaara’s musical style is greatly shaped by his personal reactions to the quick changes in Finnish arts circle. In his book, *After Sibelius: Studies in Finnish Music*, Tim Howell summarizes Rautavaara’s compositions as the kind of music that does not follow a single line of development, but amounts to a reservoir of compositional resources accumulated over time.¹²

Rautavaara’s compositional resources are not limited to compositional techniques but also music materials. Intertextual connections between compositions through rewriting and self-quotations have been a strong trait in Rautavaara’s compositions. The motives and melodies from his 1955 piano suite *Ikonit* (Icons) were reworked into his 2005 orchestral work, which he explicitly named *Before the Icons*. His 2007 piano work *Fuoco* has the similar ostinato texture, the 3+2+3 rhythmic motive and even fragments of the first movement of his second piano sonata (*The Fire Sermon*) from 1970. Although Rautavaara’s earlier works already exhibited some traces of stylistic pluralism¹³, this becomes more frequent after the late 1960s, and this has defined the composer as one of the most important examples of post-modernism in Finland. Rautavaara considers himself as the “midwife” of his own compositions, in that he believes in the importance of a certain creative force that is beyond what he called “rational control.”¹⁴ Thus instead of evolving his compositional palette via a traceable and chronological development, Rautavaara stores what he learned and experimented with into an “arsenal” of compositional technique, from which he selects the ones that work with what the music demands. In Anne Sivuoja-Guaratnam and Kimberly Scott’s research, they have suggested an alternative approach to classify Rautavaara’s music through a separate intertextual perspective approach that treats his entire oeuvre as a whole. However, Lotta Matambo chose to combine both aspects and treat the intertextual qualities as a connection between the various influences in his compositional language within the context of a traditional chronological approach.

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¹¹ Salonen (2013).
¹² Howell, p. 114.
¹³ His *Symphony No. 3*, for example, blends the twelve-tone system with German Romanticism without breaking the non-repetitive rule of tone rows, and is subsequently nicknamed “Brucknerian” (Howell).
¹⁴ Duffie.
Throughout Rautavaara’s career, his output can roughly be categorized into a minimum of four periods:

1) Neoclassicism (student years until 1957)
2) Serialism (1957 – 1965)
4) Synthetic period (ca. 1980 – 2016)\(^\text{15}\)

Since there are various theories on the categorization of the more recent works by the composer and the increasing pluralistic and post-modernist tendencies, the boundary between the third and fourth periods is vague and subject to debate. It is generally accepted that Rautavaara’s pluralistic approach matured into his own “synthetic style” by the 1980s. Both Sivuoja-Guratnam and Scott categorize the fourth period as the “second serial period” due to a reemergence of serialist writing after the composer abandoned the technique in search for a less restrictive compositional style since 1965. In Kimmo Korhonen’s research, he ended the second serial period in 1994, and further added a “mystical style” period to music composed since then.\(^\text{16}\) The thorough discussion of specific stylistic categorization of Rautavaara’s more recent works is a separate topic. In this dissertation, I will adopt the accepted common ground of grouping works since 1980 as “synthetic style”, which satisfies the multifaceted nature of his works since then.

1.2.1 Neoclassical period (until 1957)

In Kimberly Scott’s dissertation, she briefly introduced the earliest influence of Rautavaara during his first piano lessons with Astrid Joutseno. Rautavaara was particularly enchanted with the atmospheric quality of Debussy’s work. Such qualities can be seen in the use of picturesque titles in many abandoned early works, and can even be traced in the musical materials of these works, such as the sonorities used in *Ikonit* (Icons, 1955) and the concept of interval-based studies in *Etydit* (Etudes, 1969). After the First World War, young Finnish composers such as Einar Englund and Aarre Merikanto were able to travel to Moscow for studies. Modernist compositional styles, such as Neoclassicism, were then introduced in Finland upon their return.

\(^{15}\) Scott, pp. 23-37; Matambo, pp. 109-112.

The students who studied with Merikanto during the early 1950s were diligently taught in this style. Merikanto’s disdain of serialism for its overall timbre and constructivism and his belief that compositions should grow organically eventually became the cornerstone of Rautavaara’s compositional process, even during his serial period. Rautavaara also felt that Merikanto’s detailed approach to harmonization and instrumentation eventually became mannerisms that were hard to break off. The extended use of ostinato was one of the habits on which many of Merikanto’s students relied, and it can be seen in Rautavaara’s own *Fire Sermon* piano sonata, dating as late as 1970.\(^\text{17}\)

Important works for piano during Rautavaara’s neoclassical period include *Kolme symmestristä preludia* (*Three Symmetrical Preludes*, 1950) *Pelimannit* (*The Fiddlers*, 1952), and *Ikonit* (*Icons*, 1955). The influence of Bartók can be observed in the symmetrical preludes for their use of changing meters and free tonality, as well as *Pelimannit* for using folk melodies. As noted in the introduction, the use of keyboard symmetry is a recurring technique in many of the composer’s later works. Works with Christian themes such as *Ikonit* as well as the well-known *Requiem* reveal the mystic side of Rautavaara that goes beyond the Evangelical Lutheran traditions. The mystic influence will become one of the major traits in many of his later compositions, which will often have colorful titles that reflect the mystic inspirations for the composer; examples include *Angel of Dusk* (Double Bass Concerto, 1980), *Angel of Light* (Symphony No. 7, 1996), and *Christus und die Fischer* (Piano Sonata No. 1, 1969).

### 1.2.2 Serialism (1957-1965)

The training he received from Wladimir Vogel in Ascona launched the decade-long serial period in Rautavaara’s career. It is interesting to note that while many other composers tend to experiment with new techniques in small-scale works like short pieces for solo piano, Rautavaara did not write any works for piano during this period. Aside from the four basic variations of a tone row (inversion, retrograde, retrograde-inversion, and transposition), Vogel also taught the “Quintenreihe” (fifth series) and its inversion, “Quartenreihe” (fourth series). The fifth series is an auxiliary tone row derived from the prime form through a combination of a chromatic scale and circle of fifths:

\(^{17}\) Heiniö, pp. 3-4.
Example 1.1: “Quintenreihe” (Fifth Series)  

![Auxiliary series (chromatic scale + circle of fifths)](image)

The combination of every odd chromatic scale degree to the auxiliary tritones above the even numbered scale degrees forms a full circle of fifths that goes through all twelve tones before returning to the first note. When both the chromatic and fifth series are used simultaneously as two tone rows, it produces a combination of tritone and unison/octave that greatly intrigued Rautavaara. He immediately applied this technique in his first serial composition *Ave Maria* (1957) for choir, and within the same year, followed with the motet *Ludus verbalis*, as well as *Praevariata* and *Modificata* for orchestra.

Rautavaara continued his serial experiment by moving toward integral serialism. He knew about the method from Tanglewood, as Copland briefly introduced it. Vogel also made passing references, but neither of the teachers covered this topic comprehensively in their lessons. Rautavaara had to teach himself by studying other compositions and reading foreign journals, among them the analysis of Boulez’s *Structures Ia* by György Ligeti. The massive success of *Modificata* and especially *String Quartet No. 2* (1958) placed Rautavaara’s name on the forefront of Finnish musical modernism. However, his inclination to traditional tonality was strong, and instead of continuing his experiment with the orthodox total serialism, Rautavaara turned to using serial technique as a compositional tool rather than a premise that dictates the entire structure of the work. He began to combine serial technique with other approaches. This project manifested itself in *Symphony No. 3* (1961), when he combined German romanticism with serialism. Although the third symphony was composed using serial methods, the harmonic language is seemingly tonal. This return of the “Brucknerian” style caused an eruption of

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19 Ibid, pp. 38, 79.
20 The use of octave doublings and chords based on thirds gives the impression of tonal music, of which Rautavaara coined the term “non-atonal dodecaphony”. Heiniö, p. 8.
controversy that questioned Rautavaara’s position as a modernist, and subsequently alienated the composer from Vogel. Rautavaara made yet another sharp turn in style in his next work, *Arabescata* (later renamed *Symphony No. 4*, 1962). This time he applied the integral serialism that he experimented with earlier and created the first and only example of a Finnish symphonic work under integral serialism.\(^{21}\) *Arabescata* stands at the pinnacle of Rautavaara’s serial output, but he would soon realize the need to change his perspective on serialism and move on.

### 1.2.3 Neo-Romanticism (1967-ca.1980)

Rautavaara was initially successful in finding common ground between the serial constructivism and the free-flowing romanticism in *String Quartet No. 2* and *Symphony No. 3*. However, this duality quickly became an insurmountable struggle after *Arabescata*. In 1963, he planned to write a new piece using serial code derived from “Nuages” from Debussy’s *Nocturnes* for orchestra. The process was excruciatingly slow, due to the enormous amount of preparation before writing anything down. He decided to give up the project after writing a few pages.\(^{22}\) The lack of an organic flow of the compositional process made the composer feel disillusioned with the strict serial technique, and he soon left Darmstadt serialism behind to return to modal and neo-tonal writings.

Rautavaara’s pluralistic style began to emerge with *Itsenäisyyskantaatti* (Independence Cantata, 1967). He returned to writing works for piano in 1969, starting with *Etädit*, a collection of six etudes based on intervals. The two piano sonatas, *Christus und die Fischer* and *Tulissarna (Fire Sermon)*, followed in 1969 and 1970. The second sonata has become one of the most widely performed and analyzed piano pieces by the composer. The composer went on to other genres of music and would not return to writing solo piano works until 1976, when he wrote two sets of *Music for Upright Piano*. Rautavaara started to experiment with the concerto genre during the turning point of his stylistic change from the first serial period. The first concerto he wrote is for cello (1968), and his first piano concerto follows right after in 1969. Compositions throughout the 1970s display an array of modernist techniques and various musical styles that Rautavaara

\(^{21}\) Howell, p. 113.

\(^{22}\) Sivuoja-Gunaratnam (1997), pp. 85-86.
experimented with under tonal contexts, such as the use of aleatoric elements in *Regular Sets of Elements in a Semi-Regular Situation* (1971), and the use of tape recordings in his immensely popular orchestral work *Cantus Arcticus* (1972). He even wrote a comic opera that is bordering on a musical in *Apollo contra Marsyas* (1970).

Despite the rapid changes of styles in Rautavaara’s music, he began to cultivate his own voice during his neo-romantic period. The use of free tonality, mirror symmetry, ostinatos, triadic harmonies, and religious mysticism from his neo-classical period continues and, at times, intensifies. Rapid oscillating arpeggios and scale passages, and cluster harmonies are also common in his music, particularly in the second piano sonata and the first piano concerto.  

### 1.2.4 Synthetic Period (ca. 1980-2016)

By the early 1980s, when Rautavaara started to work on his opera *Thomas*, his various projects attempting a synthesis between traditional methods with modernism eventually led him back to the dodecaphonic method. Unlike his first serial period, Rautavaara was no longer aiming to achieve total serialism in his music. Instead, he wanted more stylistic synthesis and blended serialism under a tonal context (similar to his third symphony and his second string quartet). Scott’s research suggested that the return of dodecaphony was possibly due to Rautavaara’s struggles with writing large-scale works, and as he was at the height of his career in the 1980s, he felt the need return to what he believed to be a reliable technique for compositional organization. As with the composer’s ten-year serial period earlier, Rautavaara turned his attention to large-scale works, although this time due to a large number of commissions from various music festivals. The only piano work during this resurgence of serialism is the second piano concerto (1989). The bulk of Rautavaara’s operatic output was written during this time: *Thomas* (1985), *Vincent* (1987), *Auringon talo* (The House of the Sun, 1990), *Tietäjien lahja* (The Gift of the Magi, 1994), and *Aleksis Kivi* (1996).

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23 Both the first piano concerto and the *Fire Sermon* sonata instruct pianists to play cluster chords with the palm. The second movement of the sonata even asks for the use of the forearm and elbow.

24 Scott, pp. 34.
Since the completion of *String Quintet No. 1: Les cieux inconnus* (1997), the use of serial technique became less frequent and much shorter in duration when employed. The subsequent compositions afterwards return to the similar approach to the ones written during the neo-romantic period. A more detailed categorization of Rautavaara’s work since the 1970s is still yet to be fully researched. Perhaps it was due to the time it was written; Mikko Heiniö’s article on Rautavaara in the *Finnish Music Quarterly* in 1988 does not contain a separate category for the second serial period. He used pluralism and post-modernism to describe Rautavaara’s music after the first serial period. Sivuoja-Gunaratnam and Scott both saw the return of serial technique as significant enough to be categorized as a second serial period. However, judging from the synthesis of styles in works after 1970s, and the fact that the composer never adhered to the dogma of strict serial technique compared to the late 1950s and early 1960s, it might be more accurate to embed the second serial period as a phase within the neo-romantic period, which extends to this day.

Although Rautavaara’s life-long effort to balance between the old and the new may not have landed him a brand new style of composition, his experiments themselves became his own unique voice. Kimmo Korhonen describes the oeuvre of the composer as “almost a textbook case of Post-Modernism”. 25 Stylistic pluralism is Rautavaara’s language, and he saw himself as a romantic who did not fully adhere to existing schools, methods, or stylistic periods. Perhaps the most accurate description of his music appears in one of his most-quoted statements, “the romantic has no co-ordinates. In time he is yesterday or tomorrow, never today. In place he is there or thence, never here.”

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Chapter 2
A Brief Overview of Symmetry in Music

2.1 Music Symmetry Defined

The close relationship between music and mathematics has been a well-established concept since antiquity, where symmetry and the golden ratio were regarded as the ideal for beauty and rationalism. While symmetry is predominately more relevant in visual arts and architecture, composers since the medieval period have tried to link the visual aspects of music scores into audible music. Before there are any discussions on symmetry in music, it is necessary to be familiar with the various definitions of the term in a multi-disciplinary context. Merriam-Webster Dictionary\(^1\) defines symmetry under four main points:

1. Balanced proportions; Beauty of form arising from balanced proportions
2. Property of being symmetrical: correspondence in size, shape, and relative positions of parts on opposite sides of a dividing line or median plane or about a center or axis
3. A rigid motion of a geometric figure that determines a one-to-one mapping onto itself
4. The property of remaining invariant under certain changes (as of orientation in space, of the sign of the electrical charge, of parity, or of the direction of time flow)

In Roberto Donnini’s 1986 article in *Computer & Mathematics with Applications*, “The Visualization of Music: Symmetry and Asymmetry”, he discussed the relationship between the visual aspects of the music score to the auditory sensation of performed music. As symmetry is deeply engrained in human consciousness, it naturally occurs in music even when the composers did not intend to make it symmetrical.\(^2\) Similar to the dictionary definitions mentioned above, Donnini further summarized the properties of symmetry into four types:

1. Bilateral symmetry
2. Spatial symmetry
3. Symmetry of movement (rotational or translatory)

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\(^1\) Definition as of Jun 26\(^{th}\), 2018.

\(^2\) Donnini, p. 443
4. Symmetry of colour

Though some of these types of symmetry are more commonly associated with physics, mathematics, and visual arts, Donnini stated that all of them could be found in music, and they are often not mutually exclusive from each other. However, as his article was not written from a musician’s perspective, it is necessary to clarify some of the visual examples he presented so that it can be better understood in the idiom of a traditional music analysis. An obvious example of musical symmetry that can be observed in both visual and auditory senses comes from melodic shapes. The bilateral, spatial, rotational, and translatory symmetries of melodies include the common transposition, inversion, and retrograde techniques:

1. Spatial and translatory symmetry
   a. Repeat (no movement)
   b. Transposition

2. Bilateral and rotational symmetry
   a. Inversion
   b. Retrograde
   c. Retrograde inversion

As for symmetry of colour, Donnini’s explanation of its parameters is rather vague, but he did mention that chords create colours and we “react positively on an emotional and psychological level to the sensation of symmetry and this reaction is innate”. The relationship of symmetry between the score and the listening experience Donnini listed fall into two categories:

1. Visually symmetrical on paper, but are not meant to be reflected in performance

2. Symmetrical in notation that strives to create some form of auditory symmetry in performance.

While Donnini’s article puts more focus on the visual symmetry of the music score, Davorin Kempf’s article, “What is Symmetry in Music?” approaches the similar topic from a musicologist’s point of view. Both Donnini and Kempf linked the concept of music symmetry to

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3 Ibid, p. 436.
5 Donnini’s earlier examples of symmetrical music scores included an untitled love song from the court of Avignon, where the notation was drawn in the shape of a heart. Writing music in a visually striking manner is not uncommon in modern compositions, as the author himself listed Daniele Lombardi’s Tumbling Tumbleweed and Karlheinz Stockhausen’s Stimmung. A similar example can be found in George Crumb’s Magic Circle of Infinity from Makrokosmos.
repetition. Donnini looked at repetitive patterns in the form of melodic shapes that are immediately visible as well as audible. Naturally, the course of music must progress and change, thus it is inevitable to break away from the pattern. Asymmetry then becomes a necessary process to break down the symmetry that has already been established so that new materials can be weaved in. However, it is only temporary, since symmetry would eventually return in a newer form. As a composer, Kempf took the macro-structural outlook to the question of repetitions.

Thematic materials, key, and harmony are the roots of traditional forms in Western music. While not immediately visible on the score, repetitions of any of these three elements can be easily perceived by the listener’s auditory recognition. One can quickly recognize that symmetry, when broadly construed, is the cornerstone of the common tools and nomenclatures in music analysis. From the dualistic properties of antecedent and consequent phrasings to music structures such as the sonata, rounded binary, and rondo forms can all be considered symmetrical to some degree, as long as there are repeating thematic materials and modulations that return to the home key. There are also examples of symmetry across different movements in cyclic forms, where either the theme or the key are arranged to return so that the movements form a circular structure. In terms of harmonic progressions, the basic tonic-dominant relationship (I-V-I) can also be considered symmetrical.

As a more specific type of bilateral symmetry, Kempf also discussed the aspect of mirror symmetry. Contrary to the more generic definition of bilateral symmetry, which describes any dualistic property that has two corresponding halves divided by a median line, mirror symmetry is a lot stricter. The two halves from the dividing axis need to be reflective of one another and cannot be merely be a repeat or a transposition. Mirroring is thus not simply an aspect of the larger structure, but also of individual phrases, motives, or even as small as intervals and rhythmic cells. Mirror symmetry can be achieved either through intervallic reflection of pitches, time-based in rhythmic palindrome, or the combination of both pitch and time in structural retrograde, where the second half of the movement is the first half played backward. Pitch reflections can occur simultaneously, slightly delayed in imitative canon, or entirely separated

7 A well-known example of cyclic form is J. S. Bach’s Goldberg Variations, where the aria appears as both the opening and ending movement.
from the fundamental motive/melody. Based on the observations from Kempf’s article, mirror symmetry can be roughly summarized in the following characteristics:

1. Pitch-based
   a. Vertical axis (retrograde)
   b. Horizontal axis (inversion)
   c. Both vertical and horizontal (retrograde-inversion)
   d. Diagonal axis (delayed inversion or retrograde)
2. Rhythm-based
   e. Rhythmic palindrome (i.e. non-retrogradable rhythm)
3. Both pitch and rhythm
   f. Strict retrograde of an entire section

2.2 Symmetry in Tonal Music

Towards the end of Kempf’s article, he stated that the ideal or literal realization of symmetry is quite difficult to achieve under the context of a linear, tonal system. Similar to traditional harmonic analysis, symmetry in music can function in local or global levels. When it is utilized on a more local level, the reflection naturally becomes more stringent in order to maintain a perfect symmetry. The limitation that symmetry posed clearly frustrated many artists, as they constantly strived to break away from the shackles of such academicism. Stravinsky was famously quoted, “to be perfectly symmetrical is to be perfectly dead.” In one of Leonard Bernstein’s Harvard lectures in 1973, he demonstrated the “perfect nightmare of symmetry” by rewriting the opening phrase of Mozart’s *Symphony No. 40 in g minor*. By simply repeating a few extra bars of the existing material to render the entire phrase perfectly symmetrical, the momentum stemming from the unsettling uneven phrase structure disappears. As the phrase itself is already complete in the symmetrical version, there is no longer a sense of urgency to move toward a resolution. According to Bernstein:

> Symmetry is not necessarily balanced […] what Mozart has done, as any great master does, is to make the leap from ‘prosy’ symmetry into poetic balance – that is, into art.  

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8 Kempf, p. 163.
9 Craft and Stravinsky, p. 15
10 Bernstein, “Musical Syntax”. 
Bernstein’s experiment fully encapsulates Donnini’s conclusion of the necessity of asymmetry. It has already been an accepted practice to make changes in order to stay within the rules of counterpoint and tonal harmony. The answers in countless numbers of fugues are tonal answers to the subject, in which certain intervals are altered slightly to stay momentarily in the tonic key (Example 2.1). It is also expected for the recapitulation of a sonata to change, since a movement needs to finish in the home key while the exposition is to finish in a related key. Other requirements from the tonal system, such as cadence and resolutions of dissonances can make perfect symmetry, especially mirror writing, impossible without alterations. Therefore, when analyzing symmetry in tonal music, it is often fruitless to look for perfect examples. Instead, tonal alterations are ignored and many examples can still be considered symmetrical regardless of the fact that they are not exactly symmetrical.

Example 2.1: J. S. Bach: The Well-tempered Clavier Book I, No. 21 in Bb major, BWV 866, Fugue (spatial and translatory symmetry – transposition)

a) Subject opening (bar 1 – 2):

b) Tonal answer opening (bar 5 – 6):

Example 2.2: Brahms: Sonata for Violin and Piano in G major, Op. 78, bar 10 – 12 (simultaneous inversion in piano part)

Similarly, in the opening theme of Brahms’s Violin Sonata No. 1 the piano writing gives the sense of a symmetrical relationship between the hands (Example 2.2). Both excerpts above are typical examples that one can find of symmetry in tonal music. Neither of them are perfect symmetries, but the tonal alterations are not enough to disrupt the overall symmetrical writing.
Despite the difficulties imposed by the laws of counterpoint and harmonic progression, there are some extraordinary cases where composers were still able to construct entire movements in perfect symmetry without breaking the rules of tonal harmony. Some of the well-known examples of perfect symmetries can be found in the collections of canons in J. S. Bach’s *The Musical Offering*, BWV 1079, in the form of “mirroring” and “crab” canon.

**Example 2.3:** J. S. Bach: *The Musical Offering*, BWV 1079, “mirror canon” (delayed inversion)

![Canon a 2.](image1)

**Example 2.4:** J. S. Bach: *The Musical Offering*, BWV 1079, “crab canon” (simultaneous retrograde)

![Canon a 2.](image2)

Both examples from *The Musical Offering* are single line melodies that rely on the entry of the secondary canon voice to form harmony. The reflections of both of the examples are concurrent with the initial subject. The “crab canon” in Example 2.4 is meant to have both voices play at the same time, thus making the example an immediate symmetry. However, Bach did not specify where the secondary voice should enter in the “mirror canon” (Example 2.3), but instead quoted a verse from the Bible – *Quaerendo invenietis* (seek and you shall find). Regardless, as the reflective counter-subject is meant to enter later than initial subject, this makes the “mirror canon” a delayed inversion with both horizontal and diagonal axes.
A later example of tonal music with perfect structural mirroring is the *Menuetto al Rovescio* from Joseph Haydn’s *Piano Sonata in A major*, Hob. XVI: 26, where both the minuet and trio were written as palindromes, with the second section in perfect retrograde of the first. Where the earlier examples are single-line melodies, Haydn’s minuet and trio include the rarely found functional harmonies that are also reversible within the tonal context. Thus symmetry here applies to every level in pitch, rhythm, and structure.

### 2.3 Symmetry in Post-Tonal Music

#### 2.3.1 The twelve-tone system

As tonal music broke down in the early twentieth century, more possibilities for symmetry became available with the reintroduction of modal scales, as well as new territories such as polytonality, atonality, and eventually, the twelve-tone system. Composers of the post-tonal world including Claude Debussy, Béla Bartók, and Olivier Messiaen have all incorporated symmetry in their music in various ways. One of the more significant uses of pitch symmetry in the forms of inversions and retrogrades occurs in the twelve-tone system. As a replacement for the increasingly unstable diatonic system of the late romantics, the Second Viennese School relied heavily on transposition, inversion, retrograde, and retrograde-inversion of the tone-rows to ensure that the music does not hint at any pre-established key or triadic harmonies and fall back to the grip of tonality.
Arnold Schoenberg’s view on the definition of symmetry is of particular interest:

The real purpose of musical construction is not beauty, but intelligibility. Former theorists and aestheticians called such forms as the period symmetrical […] but the only really symmetrical forms in music are the mirror forms, derived from contrapuntal music. Real symmetry is not a principle of musical construction. Even if the consequent in a period repeats the antecedent strictly, the structure can only be called “quasi-symmetrical”.\(^\text{11}\)

Schoenberg stated that perfect symmetry belongs to something that is regular, and therefore not well suited for music, which needs contrasts for coherence.\(^\text{12}\) He also dismissed the kinds of symmetry that involves repetition, static accounts of musical process, or both. Stephen Peles analyzed numerous accounts of Schoenberg’s own comments on the subject of symmetry and concluded that the critical attitude toward symmetry does not mean that Schoenberg avoids symmetry in his music altogether. He believed that symmetry is a fundamental balanced stage of music of which it is final and finished on its own, in that it is the basic element sets the stage for musical process. Imbalance is deliberate, and it creates drama and narrative to keep music moving toward a resolution, which is back to the comfortable home of symmetrical balance.\(^\text{13}\) This is in line with Donnini’s description of contrasts by the means of intentional asymmetry, and Bernstein’s static symmetry experiment mentioned earlier.

Peles also claims that Schoenberg’s aesthetic against repetitions fundamentally sets the backbone of the twelve-tone system. Any kind of symmetry that involves repeating pitches is therefore out of question within a single tone row. However, the transformation of the tone row itself relies heavily on symmetry, as the matrix requires every possible result of inversion, retrograde, and retrograde inversion with transpositions in every pitch in standard tuning. The choice of which transformation to utilize allows the composer to combine different sonorities without breaking the non-repetition rule, and the result of specific combinations of rows can come close to modal

\(^{11}\) Schoenberg, p. 25 n. 1.

\(^{12}\) Stein, p. 165.

\(^{13}\) Peles, pp. 57 – 60.
or even tonal harmonies. A row combination technique that Schoenberg applied in some of his works in the twelve-tone technique is hexachordal combinatoriality – a simultaneous statement of a tone row and one of its transformations, where all twelve pitches can be covered within the first hexachord of the two rows:

Example 2.6: Hexachordal combinatoriality (from Schoenberg: *Variations for Orchestra*, Op. 31)

The primary row (P-0) and its inversion on the ninth semitone above (I-9) are stated simultaneously in the beginning of *Variations for Orchestra*. Each hexachord between the two tone rows can be combined without having any repeats in pitch, meaning that it is entirely possible to recombine each hexachord to form brand new tone rows, with each of them having intervallic symmetries within each row:

Example 2.7: Intervallically symmetrical new tone rows generated from hexachords in Example 2.6

Example 2.7a forms rotational and spatial symmetries, as the second half of the row is an inversion of the first and is shifted to start on a different note to avoid any repetitions. By taking the second hexachord from the new tone row and reorganize it in retrograde, the intervals between each pitch is now in palindrome to the first hexachord. This is easily perceived by counting the number of semitones between each pitch:

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14 Rautavaara demonstrated this with the quasi-tonal *Symphony No. 3* mentioned in Chapter 1.2.2.
The new pitch collection within a row is organized in intervallic palindrome between the two hexachords, thus forming a retrograde of intervals. The pairing of a primary series and its inversion also produces the expected horizontal axis symmetry just like any other inversions, and this type of mirror writing in the twelve-tone method is further exploited in Anton Webern’s *Variations for Piano*, Op. 27.

### 2.3.2 Mirror writing: Anton Webern and Béla Bartók

On just the level of intervals alone, pitch organization in the twelve-tone system provides ample possibilities for composers to weave symmetry in their music. Anton Webern certainly recognized the symmetrical possibilities of pitch organization, as he leaned toward choosing series that are highly symmetrical. While inversive symmetry is not at all a novel concept, Webern’s pointillistic texture of preferring different instruments for every pitch within a row over mono-timbral melodic themes sets his compositions apart from Schoenberg or Berg, who often treats twelve-tone writing in a much more liberal way by incorporating other series within a movement, which can sometimes even hint of tonality. The second movement of Webern’s *Variations* was written in pairs of dyads comprised of upper notes in the prime series and lower notes in inversion. Without interruption or deviation, the dyads alternate back and forth from the central axis on A4 in strict registral mirroring around the axis.

*Example 2.8: Webern: Variationen für Klavier, Op. 27, second movement, bar 1 – 4 (axis on A)*

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15 The interval between each hexachord is negligible, as the primary focus is the pitch intervals in each hexachord.

16 Rautavaara took advantage of this exact type of intervallic retrograde in his initial sketches while composing *Narcissus*. See *Example 5.1*.

17 Griffiths.
Béla Bartók had also extensively explored the similar kinds of mirror writing found in Webern’s Variations. George Perle saw a link between the symmetrical writings of Bartók and twelve-tone composers – dyads derived from axes of symmetry, where an axis can be set anywhere within an octave (can either be on a note or in between notes), and all subsequent dyads that results from radiating outwards from the axis are considered related as long as the distance of each of the notes from the axis remains the same.\textsuperscript{18}

**Example 2.9:** Symmetrical dyads

a) Axis on C:

\begin{align*}
(C) & - C^\# - D - D^\# - E - F - F^\# \\
(C) & - B - B^\flat - A - A^\flat - G - F^\# \\
\end{align*}

b) Axis between E and F:

\begin{align*}
(F) & - F^\# - G - G^\# - A - A^\# \\
(E) & - E^\flat - D - D^\flat - C - B \\
\end{align*}

Vincent Persichetti also mentioned this kind of symmetry in his groundbreaking treatise, *Twentieth Century Harmony*. He simply called it “mirror writing” and any chords that are based on it “mirror harmony”.\textsuperscript{19} This demonstrates that vertical pitch symmetry is a versatile technique that can be applied under both modal and twelve-tone settings.

**Example 2.10:** Bartók: Mikrokosmos, Book 6, No. 141 *Subject and Reflection*, bar 1 – 6 (axis on E)

As Bartók relied on diatonic and modal scales as his compositional foundation, inversional symmetry in this case produces something entirely different than that of the serial technique. Strict inversions of any scales will yield a different mode, and a simultaneous statement of these


\textsuperscript{19} Persichetti (1961), pp. 172 – 180.
symmetrical modes creates bitonality. The first six bars of *Subject and Reflection* above demonstrate the combination of the first five notes of B♭ Major in the right hand and E♭ Minor in the left hand.

It is obvious that Bartók believed that inversional symmetry is important for the technical developments of young pianists, since mirror writing is found throughout *Mikrokosmos* in every level, starting from *No. 12: Reflections* in Book I all the way through the later books including *No. 121: Two-Part Study* from Book IV, *No. 135: Perpetuum Mobile* from Book V, and *No. 143: Divided Arpeggios* in Book VI. The phenomenon of inversional symmetry in Bartók’s music was first suggested by Perle and has since gained traction among various theorists, including Perle’s student, Elliott Antokoletz, who expanded Perle’s findings to apply it as an universal system that is applicable for Bartók’s work in general. Unlike the above examples taken from *Mikrokosmos*, Perle’s and Antokoletz’s model involves a much more abstract interpretation of the score. The specific details of these above mentioned researches require a far more in-depth theoretical analysis of Bartók’s music, which is beyond the scope of this brief overview.

### 2.3.3  Symmetrical divisions of an octave: Claude Debussy and Olivier Messiaen

While Schoenberg’s answer to the future of tonality is deconstruction and rebuild, Debussy’s solution is blurring the boundaries and “banish the blatancy of musical expression”. Perle noticed the important role of symmetry in Impressionist music and summarized its function as follows:

> The derivation of harmonic structure and motion by means of symmetrical patterns, originally a radical impressionistic device, was popularized with the diffusion of impressionism […] These formations were primarily derived by dividing the octave into equal parts […] the interval of two semitones generates the whole-tone scale; of three, the ‘diminished 7th chord; of four, the ‘augmented triad’; of six, the tritone.

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The impressionists employed symmetrical formations in order to suspend temporarily the effect of key center, to neutralize any tendency towards motion, and to de-emphasize motivic characteristics and developmental procedures.\textsuperscript{22}

It is without any doubt that Perle was referring to what would be known as “modes of limited transposition”, popularized by the music of Olivier Messiaen. Perle affirmed that symmetry is fundamental in the new harmonic structure of French music under Debussy, which continued in the hands of Messiaen.

In Cynthia Miller’s thesis, \textit{Parallelism and Symmetry in Three Debussy Preludes}, she discussed the various forms of pitch-based symmetry utilized in \textit{Le vent dans la plaine}, \textit{Les sons et les parfums tournent dans l’air du soir}, and \textit{Des pas sur la neige}. Her research focuses on three types of symmetry that she devised: ordered pitch symmetry, unordered pitch symmetry, and registral symmetry. Her definitions of these three types of symmetry share many similar properties as some of the symmetrical devices already discussed earlier:

1. Ordered pitch symmetry: A series of pitches presented symmetrically in time that forms a palindrome
2. Unordered pitch symmetry: A collection of pitches within a symmetrical group that need to be reordered to show its symmetry
3. Registral symmetry: Boundary pitches at registral extremes that are of equal intervallic distance above and below a central axis\textsuperscript{23}

Ostinato passages in palindrome are a common place in Debussy’s music, and can be observed from many piano works on top of the \textit{Préludes} that Miller analyzed, including the \textit{Etudes} as well as \textit{Estampes}. Registral symmetry that Miller mentioned is very similar to mirror writing mentioned above, and a typical (and blatantly obvious) example of this is found in Debussy’s last \textit{Etude, Pour les accords}. When analyzing the unordered pitch symmetry, the question of scales and modes comes to mind. Debussy’s use of whole tone scales and pentatonic scales is well known. \textit{Voiles} from \textit{Préludes} demonstrates a clean-cut example of the juxtaposition of these two types of scales. While the whole-tone scale evenly divides the octaves into six whole tones, the


\textsuperscript{23} Miller, pp. 10 – 15.
pentatonic scale is symmetrical to the geographical layout of the black keys in the keyboard (details in the next section, Chapter 2.4).

Olivier Messiaen’s music from his early organ works in 1928 to his late orchestral pieces in the 1980s has a very unified consistency in terms of melodic, harmonic, and rhythmic constructions. He laid out some of his compositional techniques in his 1944 treatise, *The Technique of My Musical Language*, including the well-known “non-retrogradable rhythm”, as well as the above-mentioned “modes of limited transpositions”. Non-retrogradable rhythms are rhythmic groups in mirroring palindromes, which under Miller’s nomenclature, would be called “ordered pitch symmetry”. In Messiaen’s own treatise, he listed the seven modes that derived from the symmetrical division of the octave: the seven whole notes within an octave forms the whole tone scale – mode 1;\(^{24}\) Mode 2, also known as octatonic scale, is based on the three diminished seventh chords; mode 3 is based on the pitches found in the four augmented triads’ Modes 4 to 6 are different orders of pitches based on the six tritones.

Under the context of musical expressions on Catholic doctrines, Siglind Bruhn categorized these two techniques as symbols for Messiaen’s faith. The order of intervals in the modes of limited transposition represents the “sublime order of the world”, and the circular non-retrogradable rhythm is horizontal symmetry that is to be interpreted as the end of time as described in Revelations 10:6. Bruhn also pointed out the vertical aspect of symmetry in Messiaen’s music. She noted that F# major has a symbolic meaning for Messiaen, as he often notates six sharps as the key signature in a non-tonal context. As the F# major scale itself is symmetrical at the keyboard, Bruhn concluded that this represents the vertical relationship between man and God, where human beings are created in God’s image. This chordal aspect in this vertical symmetry is similar to the previously mentioned chords that are intervally symmetrical. Messiaen frequently used the first inversion of F# major chord with added sixth (A#-C#-D#-F#), which is also bilaterally symmetrical at the keyboard with D as the reflective axis.\(^ {25}\)

\(^{24}\) Messiaen deliberately avoided mode 1 in his music due to the fact that it had been extensively used by the impressionist composers.

\(^{25}\) Bruhn (2007), pp. 43 – 53.
2.4 Bilateral Keyboard Symmetry

Example 2.11: Keyboard symmetry layout

The term bilateral keyboard symmetry is used in Brandon Paul’s 2008 article regarding a specific kind of mirror writing that permeates Rautavaara’s music. Just like the mirror writing mentioned earlier, it is also based on axes of symmetry, where dyad relationships are based on the distance from an axis note. However, this technique adds an additional visual aesthetic when played on a keyboard instrument. Symmetry of the keyboard focuses on its geographical layout of the white and black keys, where only D and G#/A♭ can be set as axes, as the reflective notes that are equidistance from these axes have the same order of black and white keys. This mirroring technique in perfect symmetry is inherently a “deaf system”. Since it relies more on the visual aspect of the keyboard, it will result in disagreeable bitonal harmonies that are unacceptable in the context of tonal music. It is not until the twentieth century that composers would start incorporating this relation as building material for a serious piece of music. Until then, lateral mirroring at the keyboard was regarded more as a pedagogical tool for keyboardists to simultaneously develop both hands as well as a method to learn and memorize music.

Many composers, pianists, and pedagogues since the nineteenth century were aware of the benefits of simultaneous contrary motion practice, which were demonstrated in countless examples of written exercises and études, among them include the pianist-composer Leopold

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27 Paul, p. 98.
Godowsky. In numerous movements in his Studies after Frederic Chopin, he challenges the limits of pianists by either changing the original Etude to the opposite hand, or adding an additional line on top of the original for both hands to engage in simultaneous mirroring acrobatics. However, since Godowsky intended the studies to function as concert études, the music still needs to be within the tonal context. As mirroring technique serves only as exercises for the hands, tonal adjustments were preferred over the strict symmetry of black and white keys. The Swiss pianist and pedagogue, Rudolph Ganz, also believed in the importance of symmetrical exercises. He dedicated a large portion in his published piano exercises to incorporate perfect simultaneous mirroring between hands in an effort to develop both hands simultaneously, as the left hand is often neglected compared to the right hand. His humorous “dialogue” between the two hands summarizes the philosophy of mirror practicing:

> How often have I listened to the whispered conversation between my two hands: “Difficult?” “Indeed.” “I’d like to try it and conquer it too.” “Go ahead. Symmetrically, it is easy. Use the same fingering as mine!”

Persichetti’s treatise categorized many post-tonal compositional techniques that have been used in compositions up until the publishing year of 1961. The concept of symmetry is obviously important to him, as he referred to the octatonic scale as the “symmetrical scale” under the category of synthetic scales. This is an important detail for Rautavaara, as his late pieces contain significant usage of octatonic scales as well as Messiaen’s mode six for the purpose of displaying keyboard symmetry. Persichetti dedicated half of a chapter on mirror writing (grouped together with compound harmony construction) and presented various possibilities of constructing harmonies based on reflections on building tones. Possible tools for structural and thematic developments based on mirror writing were also laid out. Since the book focuses on the theoretical aspects of composition, the chapter concentrates on pitch-based intervallic mirroring and only mentions keyboard symmetry briefly as a subset of a larger topic on mirror writing. Despite the lack of representation of bilateral keyboard symmetry in his textbook, Persichetti’s interest in the possibilities of keyboard symmetry as a pedagogical tool led him to write

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28 For more details on the contents of Ganz’s exercises, see Chapter 6.3.


30 Persichetti, (1961), p. 44.
Reflective Keyboard Studies, Mirror Etudes, as well as the Twelfth Piano Sonata from 1978 to 1980. Reflective Keyboard Studies is a collection short exercises that aims to train both hands simultaneously. It tackles various virtuosic demands on the keyboard in preparation for the Mirror Etudes and the sonata. Titled the “Mirror Sonata”, the entire Twelfth Piano Sonata is set in strict simultaneous keyboard symmetry with both hands set in the exact same rhythm throughout. The topic of mirror writing, whether it is based on intervals or on the geographical layout of the keyboard, is a type of symmetry that has not been extensively studied or systematically categorized until his treatise. Persichetti himself provided a possible explanation, namely that it is due to the fact that tonal music throughout the centuries is based on the natural acoustical properties of the overtone series, while mirror writing constructs a reflective undertone series that is more theoretical than aural.\(^\text{31}\)

Persichetti’s large-scale work Mirror Sonata still stays within the boundary of his own definition of keyboard symmetry – simultaneous and uniformed keyboard technique.\(^\text{32}\) Rautavaara had completed the same project thirty years earlier in the Three Symmetrical Preludes, but then moved on to develop a unique harmonic language that is derived from keyboard symmetry itself. As with other compositional tools that the composer acquired over the years, Rautavaara prefers to forge new sounds by the means of combining existing styles of writing rather than finding a new system as Messiaen or Schoenberg did for their music. As the readers will discover in later chapters, symmetrical writing, even when it is keyboard symmetry, is not limited to homophonic textures.

### 2.5 Overview of Symmetry in Rautavaara’s Music

The intertextual unity and self-quotation in Rautavaara’s music have been well studied and documented in the research by Sivuoja-Gunaratnam, Matambo, and Scott. As pitch and keyboard symmetries are present throughout Rautavaara’s entire oeuvre since his student days, there are also recurring techniques that the composer relied on for symmetry writing. While serialism

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\(^\text{31}\) Ibid., pp. 172 – 173.

\(^\text{32}\) Ibid., p. 179.
presents possibilities for pitch symmetry, it does not apply for Rautavaara’s piano music, since
the composer’s serial works are almost exclusively larger scale works. The only exception to this
is found in the initial sketches in Narcissus, but even then the symmetrical tone row was more of
an inspiration to the final melody in the piece and not directly used (details in Chapter 5.1).
Modal scales and bitonality are more common in the composer’s solo piano works. Of
Messiaen’s seven modes of limited transpositions, modes 2 and 6 are widely used in
Rautavaara’s music, as these two modes can easily fit the symmetry of the keyboard. Mode 2 is
also known as the octatonic scale, where semitone and whole tone relationships alternate:

1-2-1-2-1-2\(^{33}\)

Mode 6 doubles the number of semitones and whole tones in each alternation, creating a mixture
of diatonic and whole-tone scale:

1-1-2-1-2-1-2

**Example 2.12:** Mode 2 and 6 transposed to accommodate keyboard symmetry

a) Mode 2

\[
\begin{array}{cccccccc}
\text{C} & \text{D} & \text{E} & \text{F} & \text{G} & \text{A} & \text{B} & \text{C}\n\end{array}
\]

b) Mode 6

\[
\begin{array}{cccccccc}
\text{C} & \text{D} & \text{E} & \text{F} & \text{G} & \text{A} & \text{B} & \text{C}\n\end{array}
\]

\[33\text{ The numbers here indicate the number of semitones between each note.}\]
While Rautavaara did not adopt the same variety of symmetrical rhythm that is comparable to Messiaen's non-retrogradable rhythm, he does employ a specific rhythmic palindrome in several of his works. He often groups eighth notes into a $3 + 2 + 3$ pattern and uses this as a motoric device. Matambo saw the similarity of this uneven pattern and linked it to the rhythm of traditional Bulgarian folk music, which came to Rautavaara through the music of Béla Bartók.\footnote{Matambo, pp. 2, 97.} The definition of the Bulgarian asymmetrical rhythms according to \textit{Oxford Music Online} (which Matambo also quoted in her paper) states that they are “combinations of simple duple and triple metres strung together to create heterometric patterns.”\footnote{Buchanan.}

\textbf{Example 2.13:} Different variations of “Bulgarian rhythm”

a) Bartók: \textit{Mikrokosmos}, Book 6, No. 149, \textit{Dances in Bulgarian Rhythm}, No. 2, bar 1 – 2 (2+2+3 pattern)

\includegraphics[width=\textwidth]{example2.13a}

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b) Rautavaara: \textit{Fuoco}, bar 1 – 2 (3+2+3 pattern)

\includegraphics[width=\textwidth]{example2.13b}

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c) Rautavaara: \textit{Mirroring}, bar 53 – 54 (3+3+2+3 pattern)

\includegraphics[width=\textwidth]{example2.13c}

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The examples above show three variations of the Bulgarian rhythm that can be found in Rautavaara’s piano works, but most common by far is the symmetrical 3 + 2 + 3 pattern. As will be discussed in a later chapter, this pattern first appears in a movement from *Icons* during his Neo-Classical period, and would be the composer’s signature motivic pattern until his late works, including (but not limited to) *Icons*, both piano sonatas, the third movement of the first piano concerto, and *Fuoco*. In terms of pitch symmetry, Rautavaara prefers to organize symmetrically reflective notes into chordal groups. They can either be written as solid chords or broken into rapid oscillating arpeggio figures. Depending on the way the chords are set up, the harmonic result can wander between bitonality, modal, or chromatic.

**Example 2.14**: List of recurring exotic chords and clusters found in Rautavaara’s piano music

1. Bitonal chords
   a) F and E major triads positioned to reflect keyboard symmetry
   b) D major and F major 7th chord (can be heard as bitonal or single chord with both major and minor 3rd – harmonic ambiguity)
2. Intervally symmetrical 7th chords
   a) Minor 7th (3 – 4 – 3) in keyboard symmetry
   b) Major 7th (4 – 3 – 4)
3. Symmetrical dyads as single chords in contrary motion
4. Quartal chord
   a) Open 4ths
   b) Inversion and its mirror reflection
5. Quintal chord
   a) Open 5ths
   b) Inversion and its mirror reflection
The examples above are among the most common chordal techniques that Rautavaara applies to his piano music. In fact, chords and clusters are so extensively used to thicken the texture, they often appear simultaneously as the melody line in solid chords and accompaniment as rapid oscillating arpeggio figures. The reader will be able to observe these examples in action in the next few chapters. When incorporating symmetry into chords in piano, Rautavaara has two types of chords: 1) interval symmetry and 2) keyboard symmetry; and two ways of playing them: 1) split between hands or 2) within a single, often large, hand span. It should be noted that interval and keyboard symmetries are not mutually exclusive, since it is possible to be both, as shown in 1a). As duality is the key characteristic in symmetry, it is natural that bitonality is a key characteristic in Rautavaara’s music. The bitonal harmonies are often written in a very accessible way for pianists, where the chord is evenly split between the hands, and often in either interval or keyboard symmetry. 1b) shows the first bitonal chord in *Terrsit* from *Etudes* (see Chapter 4.1.1), which shows the composer utilizing bitonal harmonies even without the presence of keyboard symmetry.

Rautavaara also made extensive use of major 7th, minor 7th, quartal and quintal chords, as these chords are intervallically symmetrical by themselves. He was also very fond of constructing four-note chords using a pair of dyads with identical intervals that are separated by either a semitone or a whole tone. This type of chord often requires very large hand spans as it is often written for one hand only. The contrary motion of the outer notes from 3) can be found in the *Fire Sermon* sonata, and parallel movements of symmetrical dyad chords is seen as late as *Mirroring*.

Rautavaara often arranged notes in positions that would create a sense of harmonic ambiguity, and he often did this through adding a note in the middle of open dyads to form seconds with either the top or bottom note. Since the interval of fourth and fifth are inversions of each other, the chordal “inversions” included in 4b) and 5b) are actually the same kind. The middle notes of these kinds of chords are sometimes chromatically altered to further the ambiguity via chromatic second interval within a chord. Finally, the clusters that the composer is fond of using in his neo-
romantic works can be interpreted as extended tertian chords as demonstrated in 6a) and 6b). He often divides clusters into black and white keys and would ask performers to employ the palm of the hand or even the entire forearm to execute an extended range of clusters. The clusters tend lose their harmonic function when extended beyond a certain point and would sound more like an effect. Remarkably, Rautavaara managed to write the first thematic material of the first piano concerto using nothing but clusters for both the piano and the orchestra entrances, and he used just enough for the cluster to have a melodic line above ambiguous (and somewhat modal) chords.

One thing that needs to be clarified is that while many of these chords can be expressed within the strict confines of keyboard symmetry, Rautavaara often transposes them away from it as the music requires, quite understandably so, since keeping strict keyboard symmetry would result in very static movements when using modal harmonies.

Many of the chosen examples and discussions in this chapter are designed to be better equipped in analyzing the symmetry in Rautavaara’s piano works. There are many other symmetrical examples that were left out, due to either the fact that they are far too abstract for the purpose of this paper or not as relevant in Rautavaara’s music. One such example is structural retrograde mentioned in various tonal examples in Chapter 2.2. Rautavaara’s music is surprisingly linear considering the amount of symmetrical relationships he included in his music, meaning that most of the symmetry discussed will be geared towards pitch symmetry. The specific post-tonal composers mentioned above all had profound influences on Rautavaara, and a side-by-side outlook of symmetry between their works is an appropriate preparation for turning now to Rautavaara’s music.
Chapter 3

*Three Symmetrical Preludes* (1950)

The *Three Symmetrical Preludes* for solo piano were among Rautavaara’s earliest works. These short preludes were written between 1949 and 1950, and it was the earliest composition for solo piano that the composer published. According to Rautavaara’s own account, he discovered the compositional technique based on the symmetrical properties of the keyboard during his student years and was not aware that other composers had already experimented with bilateral keyboard symmetry. Although the *Three Symmetrical Preludes* are experimental in nature and not as substantial as his other works in the same period, it is nevertheless critical to study these works, as bilateral keyboard symmetry remained an important characteristic in Rautavaara’s music throughout his career. It should be noted that while keyboard symmetry is important in these preludes, other forms of symmetry are also explored, and they are just as integral to the composer’s musical language.

All of the three preludes share a similar structural dichotomy, where thematic/motivic materials are sometimes introduced and developed separately from the symmetrical and asymmetrical sections. The preludes all start with a mirroring section that alternates with a contrasting asymmetrical middle section throughout each piece. Since Rautavaara often alternates between symmetry and asymmetry in the middle of a thematic material, it makes more sense to divide the structure of these pieces based on thematic materials and consider mirror writing (or lack thereof) as characteristics in each section. The textures in the symmetrical sections are largely homophonic, and the melodies are reflected simultaneously. These preludes are, among Rautavaara’s entire output, the closest precursor to Persichetti’s *Mirror Studies* (1979) and *Sonata No. 12, Op. 145* (1980), in that these pieces are specifically constructed with the mirror writing technique as their central focus. Although mirror writing remained an important characteristic in Rautavaara’s music throughout his life, the technique is only applied as one of the compositional tools that form a part of a composition.
3.1 Prelude No. 1

Table 3.1: Rautavaara: *Prelude No. 1* structure

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</thead>
<tbody>
<tr>
<td>A</td>
<td>B</td>
<td>A’</td>
<td>Development (B in mirror)</td>
<td>B’</td>
<td>Codetta (B in new axis - A♭)</td>
<td></td>
</tr>
</tbody>
</table>

Example 3.1: Rautavaara: *Prelude No. 1*, bars 1 – 6 (Section A)

The first prelude has the most frequent meter changes compared to the other two in the set. The entire piece is built upon two thematic materials (section A and B), and the structure resembles a truncated sonata form with a development and a codetta but no recapitulation. The main feature of this prelude is the insistent quarter-note motive in either repetition or in displaced octaves. These quarter notes return every other bar from the beginning till the end with an exception within the development section from bar 34 to 36. The quarter notes in displaced octaves also serve as a structural division between different sections.

Section A consists of collections of eighth-note groups in various lengths that are followed by a quarter-note motive in staccato. The tonality is generally free chromatic, but there are hints of the symmetrical octatonic scale, such as in bars 1 and 5, which contain an incomplete form of the scale. The mirror reflection is based on the axis note D, and it is initially emphasized as repeating notes. The quarter-note motive eventually moves to C# and the reflective E♭, which, along with D, forms the central block between the symmetrical reflections throughout the piece. As noted above, except for a brief passage in the developmental section (bar 34 - 36), this motive returns every other bar until the end of the prelude, and is therefore also a component of thematic material B and a unifying motive for the entire prelude.
The quarter-note motive is suddenly reduced to just two notes in bar 12, and instead of repeated notes, each hand jumps between C# and E♭ in displaced octaves. Mirror writing stops at bar 13, the onset of section B (Example 3.2). While the eighth notes and the repeating quarter notes are still prominent, the second theme sees the addition of dotted rhythm and a triplet. The reliance on the chromatic scale is more obvious here in both hands, now moving independently. In bar 16, the pitches of the quarter-note motive change in the right hand to A♭ (the other possible keyboard symmetry axis that reflects the same pairs of pitches as a D axis). Although there is no mirror writing around A♭ at this point, it foreshadows the real axis modulation towards the latter part of the prelude. For the moment, after a sweeping quartal descent in the right hand, D is rearticulated as a pitch axis at the downbeat of bar 18, which concludes the B material.

Example 3.2: Rautavaara: Prelude No. 1, bar 12 – 20 (Section B and A’ opening)

In bar 18, the quarter-note motive jumps once again in octave displacements between C#, D, and E♭, the pitches employed in this motive in the opening bars of the prelude. At this point it is clear that the quarter-note motives in displaced octaves function as divisions between sections, since they occur both at the end of A (bar 12) and B (bar 18). Section A in mirror returns in bar 19 with added inner voice, providing a thicker texture in each hand and contributing to a sense of growth.
Example 3.3: Rautavaara: Prelude No. 1, bar 30 – 33 (Development)

After a breath mark at the end of bar 30, the second statement of the displaced quarter-note motive in bar 31 introduces a development-like section. It would seem that Rautavaara added the breath mark before bar 31 as a musical device of interrupting himself by terminating the second statement of A abruptly. As the quarter-note motive in displaced octaves has been integral to the structure of the piece by serving as closures of previous sections, in strict observation, this would put the development section to start in bar 32 instead of 31. The new section applies the dotted rhythm from section B in a symmetrical configuration and combines it with the eighth notes and quarter notes from the repeating motive, which interrupts its regular recurrence until bar 39. Symmetry disappears once again in bar 40 as section B makes its second appearance, with added grace notes in the motives (Example 3.4). The displaced octaves of D, C#, Eb in bar 39 once again closes the section, and the original form of B returns in bar 40.

Example 3.4: Rautavaara: Prelude No. 1, bar 39 – 43 (B’)

The emphasis of A♭ in bar 43 leads both hands to a new keyboard area. This foreshadows the subsequent symmetrical transitions in bar 45 and 46 based on the reflection on a new axis, Ab. It also changes the course of the right hand in the third statement of section B at bar 47 (now functions as a codetta), which starts the chromatic descent from B♭ instead of E♭. The struggle to modulate back to the D axis continues until bar 52, where D is repeated in three different
octaves, followed by blocked C#/E♭ and D octave that function like a traditional cadence. The prelude finishes with a blocked cluster around these three original framework notes.

**Example 3.5:** Rautavaara: *Prelude No. 1*, bar 46 – 54 (Codetta)

![Example 3.5: Rautavaara: *Prelude No. 1*, bar 46 – 54 (Codetta)](image)

**3.2 Prelude No. 2**

<table>
<thead>
<tr>
<th>Table 3.2: Rautavaara: <em>Prelude No. 2</em> structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Theme</td>
</tr>
<tr>
<td>51 – 73</td>
</tr>
<tr>
<td>Transition 2’ (Sequence &amp; Variation)</td>
</tr>
</tbody>
</table>

**Example 3.6:** Rautavaara: *Prelude No. 2*, bar 1 – 4 and bar 12 – 15

a) Bar 1 – 4 (Section A)  
b) Bar 12 – 15 (Transition 1)

![Example 3.6: Rautavaara: *Prelude No. 2*, bar 1 – 4 and bar 12 – 15](image)

If we consider the extensive use of chromatic as well as some octatonic scales in the first prelude as Rautavaara’s attempt to achieve harmonic unity in mirror writing, then the second prelude explores the duality aspect of simultaneous symmetrical inversions. Symmetrical duality here is manifested in the form of bitonality and chords comprised of two halves that are symmetrical.
The structure of the second prelude is similar to a rondo form in three themes with substantial bridge sections between each theme.

The piece starts with both hands in opposite ends of the keyboard in symmetrical broken triads – D minor and G major. Both hands gradually move toward the axis on D4 through a series of reflective broken triads in bitonality. The overall harmony progresses gradually from unrelated and dissonant triadic pairings to moments when the two triads seemingly merge into a single chord with extended ninth (bar 4 and 8), or a triad with an added sixth (bar 12). It is important to mention that the notes on the music itself were chosen to best reflect the visual aspect of keyboard symmetry between the hands. Respellings of certain notes are often required to describe the auditory experience when the composer attempts to blend the bitonal harmonies together. For example, when the notes in the right hand in bar 12 were to be respelled as D# and A#, then the overall symmetrical harmony of F# major with added sixth will be even more obvious in the perspective of traditional harmonic analysis. In addition to triadic harmonies in the beginning, the second prelude has a large emphasis on open fifth dyads throughout the piece starting in bar 12. Rautavaara eventually transforms the fifths into seconds, and then superimposes both intervals in single cluster chords later on.

From the initial impression of the second prelude, the overall structure seem to be once again based on rhythmic motives, with section A in the pattern of either three eighth notes or eighth + two sixteenths + eighth; and a new section in bar 12 changing to dotted rhythms. However, this perspective grows in irrelevance as the piece progresses, since the dotted rhythm continues uninterrupted for a significant length and only stops in bar 65. It is clear that the composer strived to achieve unity in the piece using dotted rhythm as its basic motive. The variations on the open dyads and their symmetrical relationships become the central material that divides the sections.

Example 3.7: Rautavaara: Prelude No. 2, bar 16 – 20 (Transition 1 to B)
As mentioned earlier, the two open-fifth dyads in mirror reflection in bar 12 can be respelled as a single chord of F# major with an added sixth. Rautavaara transposed the same chord chromatically downwards from bar 14 to 16. The bitonal nature of the opening is blurred with the tonal ambiguity of these open fifths as well as the disappearance of mirror symmetry itself at the end of bar 13. The rhythmic texture in the first transition remains homophonic until section B in bar 17, where the right hand continues the dotted rhythmic pattern while the left-hand changes to descending fifths in quarter notes. In traditional tonal analysis, the right-hand dyads in bar 17 to 18 moves between diminished sixth and perfect fourth; and perfect fifth to augmented third in bar 19 to 20. Once again, respelling some of these notes will reveal Rautavaara’s intention for the right hand’s dyads to progress in a symmetrical contrary motion between the exact same intervals. For the first time in these preludes, the composer included a mirror reflection that is not based on the geographical layout of the keyboard.

**Example 3.8:** Rautavaara: Prelude No. 2, bar 25 – 30 (Transition 2)

The second transition is based on a rising sequence based on two pairs of open fifth dyads. The dyads initially begin in a keyboard mirroring pair, and then descend downwards chromatically before jumping upwards to the next group. It should be mentioned that the first pair of dyads in both bar 25 and 27 are mirror reflections. Full keyboard symmetry returns in bar 29 and continues throughout section C.

**Example 3.9:** Rautavaara: Prelude No. 2, bar 37 – 41 (C to Transition 1’)
The texture in section C returns to a single-lined melody in mirror reflection, which also brings back the bitonality from the beginning of the prelude. The transformation of the open-fifth dyads into seconds takes place gradually starting at the return of the first transition in bar 38 and continues through the return of section B (bar 43). Mirror writing fades into asymmetry in the middle of the transition just like its first iteration. Starting in bar 45, Rautavaara started to use a series of cluster triads that combines the open-fifth dyads with seconds. This new cluster chord replaces the open-fifths in the return of transition 2, which is now extended in length and includes a sequence variation in bar 65. The composition of the clusters is based on the open-fifth dyads from the earlier sequence and mirror symmetry still serves as the starting point every two bars.

Example 3.10: Rautavaara: Prelude No. 2, bar 51 – 54 and 65 – 68

a) Bar 51 – 54 (Transition 2’ opening)

b) Bar 65 – 68 (sequence variation)

The prelude reaches its climax in \textit{fff} at the top end of the rising sequence in bar 64. The subsequent sequence variation in the following bar takes the cluster chords and breaks them into triplet groups, which breaks the continuous dotted rhythm motive since bar 12 and brings the register down to a low D in fermata in bar 73.

Example 3.11: Rautavaara: Prelude No. 2, bar 73 – 77
Materials from section A returns in the right hand only, and the left hand serves as a grounding bass in D, G#, E♭, and A. These bass notes form an independent line that does not seem to support the right hand harmonically. It is important to note that D and G# are the two axis notes in keyboard symmetry and they are a tritone apart. By grouping the first two notes together, this will make the subsequent E♭ and A as a tritone answer. The left hand eventually joins the right hand in symmetry but is quickly interrupted by the third statement of the transition 1 material, which now functions as a codetta. Dyads quickly change into the earlier clusters and regular triads and both hands stayed in mirror symmetry all the way till the end of the piece. In between the long, held chords towards the end of the prelude, Rautavaara experimented for the first time with sympathetic vibrations – a technique that will return in his second piano sonata two decades later. The repeating E♭ and F# from the symmetrical clusters in each hand closes the prelude, representing the duality of their mirror reflection.

Example 3.12: Rautavaara: Prelude No. 2, bar 91 – 98

Table 3.3: Rautavaara: Prelude No. 3 structure

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<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
<td>A’</td>
<td>B’</td>
<td>A''</td>
<td>Codetta</td>
</tr>
</tbody>
</table>

Example 3.13: Rautavaara: Prelude No. 3, bar 1 – 4 and bar 10 – 12 (symmetry vs. asymmetry)

a) Bar 1 – 4 (Section A)  
b) Bar 10 – 12 (Section B)

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The final prelude is the shortest and structurally the simplest one out of the earlier two pieces – rondo in two themes. Mirror writing here has a more integral structural function, as the sections are clearly divided between symmetry (section A) and asymmetry (section B). Rautavaara relied on modal scales in white keys as well as the whole-tone scale for harmonic unity in the mirror sections. Elsewhere, dyads in thirds play an important role in the harmonic construction, and most of the chords in section B derive from stacked thirds such as major seventh and extended ninth chord.

Example 3.14: Rautavaara: Prelude No. 3, bar 18 – 21 (A’)

Example 3.15: Rautavaara: Prelude No. 3, bar 24 – 27 (B’)

While the texture of section B is intended to be freer from the restrictive confinement of mirror writing, symmetry still plays a role in the chordal construction. The first statement of B starting in bar 10 is still largely based in mirror reflection, as the repeating A min7 and G maj9 are simultaneous reflection of dyads in thirds. Asymmetry is more obvious in the second statement of B in bar 24, when the minor seventh chords and extended ninth chords are fuller. While these chords are not in mirror symmetry, they are symmetrical intervalically in the root position: major seventh chords are comprised of two minor third (3 semitones) dyads in the outer notes and a major third (4 semitones) in the middle (3 – 4 – 3); and the semitones between ninth chords are in the order of 4 – 3 – 3 – 4.
Cluster chords comprised of various stacked intervals of seconds occur intermittently as neighboring chords in B in a more spread out position. They eventually come back in closed position towards the end of the piece. These full cluster chords will eventually become one of Rautavaara’s characteristics in later pieces, where he asks the performer to play with the palm or even with the entire forearm. The abrupt ending of the prelude in the famous motive from Beethoven’s Fifth Symphony is not derived from any previous thematic material. It is perhaps a salute to the old master from the young composer at the start of his career.

Example 3.16: Rautavaara: Prelude No. 3, bar 39 – 42 (Codetta)

3.4 Summary of Observations in Three Symmetrical Preludes

Various authors, including Tim Howell and Kimberly Scott, have discussed the postmodernist elements in Rautavaara’s music in their research. There are significant numbers of commonly used compositional tools in Rautavaara’s music whose origins we can trace back to these early preludes. A large number of his works utilized constructivist elements without restricting the flow of his music, which follows a point from Jonathan Kramer’s list of characteristics of postmodernism of avoiding the totalization of forms.¹ Some of the techniques that are used for expressing symmetry can also be either transposed or reinterpreted into contexts where symmetry is no longer present. The compositional elements already present in these preludes that will recur in the future are as follows:

1. Heavy harmonic emphasis on D and G# (axis of bilateral keyboard symmetry)

2. Use of symmetrical scales:
   a. Mode 2 (octatonic) scales

¹ Kramer, p. 21.
b. Chromatic scales (often in the form of clusters)
c. Whole-tone scales
d. Certain diatonic or modal scales with symmetrical properties (e.g. F# Major and D Dorian)

3. Concept of duality:
   a. Bitonality
   b. Vertically symmetrical chords

4. Emphasis on chords comprised of stacked thirds that are intervallically symmetrical in root position
   a. Minor 7th chords
   b. Extended 9th chords

3.5 Symmetry in Other Early Works

The *Three Symmetrical Preludes* are constructivist examples among Rautavaara’s early works that point more towards his later periods than other works in the same period. His other works in the neo-classical period demonstrate other aspects of his early style, including nationalist folk elements in *The Fiddlers* and Orthodox-based mysticism in *Icons*. However, this does not necessarily mean that the other works are completely free from any constructivist elements. Rautavaara would eventually discover more ways of expressing symmetry in addition to the ones mentioned earlier in this chapter via other pieces. In the fourth movement of *Icons*, composed five years after these preludes, he introduced the 3 + 2 + 3 Bulgarian rhythm pattern mentioned in Chapter 2.5. Other common tools such as ostinato would be interwoven with these symmetrical chords and scales in his later works, providing greater varieties of harmonic and rhythmic textures as well as in a more mature interpretation of symmetry in music.

Example 3.17: Rautavaara: *Icons*, “Baptism of Christ” bar 1 – 4

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While keyboard symmetry is not found in *The Fiddlers*, it does make an appearance in the middle section in the second movement of *Icons*. This is Rautavaara’s first example of incorporating keyboard symmetry as an expressive tool to create a unique texture within a composition rather than a pure constructivist experiment like the *Three Symmetrical Preludes*. Unsurprisingly, this trend will reemerge in the neo-romantic period in the late 1960s when the composer tried to shake off the restrictive nature of constructivist serialism. Just as Rautavaara felt confident enough to reintroduce serial techniques in his later works in 1980s, he would reintroduce keyboard symmetry in a more varied and mature way in his late pieces (see Chapter 5).

**Example 3.18**: Rautavaara: *Icons*, “Two Village Saints” bar 1 – 2 and bar 15 – 17

a) Bar 1 – 2: Main theme

b) Bar 15 – 17: Main theme in keyboard symmetry

Towards the end of the neo-classical period, Rautavaara wrote two more sets of piano works, *Partita* and *Seitsmän preludia pianolle* (*Seven Preludes for Piano*). These two works were written during the composer’s study in the United States and in the midst of his compositional crisis. The *Partita* shows the composer’s reliance on the neo-classical style that he was used to since his studies with Merikanto, while *Seven Preludes for Piano* are proto-serialist experiments that show Rautavaara’s determination to leave his earlier style behind. Matambo identified this new set of preludes as proof that while Rautavaara was experimenting with what he learned from Persichetti and Copland in each movement, he was unable to develop his motifs.²

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² Matambo, p. 73.
symmetry, however, is not a strong trait in either one of these last two works before his serial period. The only instance where it is present is in the last of the *Seven Preludes*. The technique utilized there is the same as the above-mentioned example from *Icons*, where keyboard symmetry is simply incorporated as a variation of the main motivic material, and the texture remains as simultaneous mirroring between the two hands. The next chapter will show how Rautavaara’s writing matured as he freed himself from the constraints of symmetrical writing and was able to combine different textural varieties with symmetry itself.

**Example 3.19**: Rautavaara: *Seven Preludes for Piano*, Op. 7, No. 7 bar 1 – 2 and bar 8 – 10

a) Bar 1 – 2: Main motif

b) Bar 8 – 10: Variation of main motif in keyboard symmetry

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Chapter 4
Neo-Romantic Works

Rautavaara’s disappointment with his decade-long experiment with the strict serial technique led him to return to composing for the piano. The six Etudes, the first piano concerto, Piano Sonata No. 1 “Christus und die Fischer”, and Piano Sonata No. 2 “Fire Sermon” were all completed between 1969 and 1970. With the twelve-tone method all but abandoned during this time, the composer returned to modal and tonal harmonies that he had been using in his earlier works. As Rautavaara left behind the method that he relied on to write substantial works, his solo piano works during this time are short and closely resemble the composer’s pre-serial works. However, there is a greater sense of complexity and maturity in these works. The Fire Sermon sonata is by far the most successful and widely performed solo piano work the composer has ever written, and thus it has been studied quite extensively through various research papers and articles. Erik Tawaststjerna’s 1982 thesis on Finnish piano music contains a bar-by-bar analysis of this work. Both Scott and Matambo have covered this iconic work in their research, and they have discussed the uses of symmetry and intertextual connections to other works. Finnish Music Quarterly also published a brief discussion of Fire Sermon in 1984, though it is more for general public than academic purposes. In comparison to the abundance of resources available for the second sonata already, the other solo piano pieces during this period, namely the first sonata and Etudit have been rather neglected. Within the context of this dissertation’s main topic, they are equally important as the second sonata, since symmetry plays a significant role in large portions of these two works. This chapter will attempt to fill this gap of research through discussions and analysis of selected movements from Etudit and Piano Sonata No. 1 under the perspective of symmetry writing.

4.1 Etudit (Etudes)

During the late 1960s, Rautavaara stated that he felt that the mainstream approach to piano music during this time was sparse and aphoristic. He wanted to “reintroduce a sonorous, broad piano style using the entire compass of the keyboard.”¹ The six Etudit (Etudes) were written with this

¹ Mikkola (1999), liner notes.
in mind, which initiated the composer’s Neo-Romantic period. Similar to Debussy’s Études, the title of each study is based on a specific interval:

1. *Terssit* (Thirds)
2. *Septimit* (Sevenths)
3. *Tritonukset* (Tritones)
4. *Kvartit* (Fourths)
5. *Sekunnit* (Seconds)
6. *Kvintit* (Fifths)

These etudes were completed in 1969 and were dedicated to the Finnish pianist Ralf Gothóni, who premiered the set on March 15, 1970 amidst mixed receptions. While Rautavaara’s contemporary, Erik Bergman, gave praise, the critic Seppo Heikinheimo criticized the set as a step backwards when compared to the piano works of Prokofiev and Debussy. However, this may seem to be a criticism only on the lack of technical requirements for the genre of piano etudes, as three years later, Heikinheimo complimented the ballet music of *Kiusaukset* (The Temptations), in which Rautavaara reused the music from *Etydit*. Similar to the Seven Preludes for Piano, each movement of the *Etudes* explores an aspect that relates to a specific interval. The main characteristics of each etude can be summarized as the following:

**Table 4.1:** Summary of characteristics in each movement of *Etydit* (1969)

<table>
<thead>
<tr>
<th>Etude</th>
<th>Characteristics</th>
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<tbody>
<tr>
<td>Terssit</td>
<td>Symmetrical (pitch) chords in stacked thirds that form major 7ths and extended 9ths</td>
</tr>
<tr>
<td></td>
<td>Bitonality</td>
</tr>
<tr>
<td></td>
<td>Broad melody above rapid oscillating arpeggio</td>
</tr>
<tr>
<td>Septimit</td>
<td><em>Perpetuum mobile</em> dyads in major 7ths and minor 2nds (inversion)</td>
</tr>
<tr>
<td></td>
<td>Additive phrases and rapidly changing meters (resurgence of neo-classical elements)</td>
</tr>
<tr>
<td>Tritonukset</td>
<td>Slow, chorale-like texture</td>
</tr>
<tr>
<td></td>
<td>Mode 2 (octatonic) scales</td>
</tr>
<tr>
<td></td>
<td>Tritone dyad in pairs that form keyboard symmetry</td>
</tr>
<tr>
<td>Kvartit</td>
<td>Broad melody above oscillating arpeggio</td>
</tr>
<tr>
<td></td>
<td>Arpeggio made up of symmetrical dyads in 4ths</td>
</tr>
<tr>
<td></td>
<td>Quartal chords (pitch symmetry)</td>
</tr>
<tr>
<td></td>
<td>Keyboard symmetry middle section in both simultaneous and delayed mirroring</td>
</tr>
<tr>
<td>Sekunnit</td>
<td>Solid 2nd dyads in ostinato with bass line dyads moving in keyboard symmetry</td>
</tr>
</tbody>
</table>

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2 Tiikkaja, p. 301.
The *Etudes* combine much of the symmetrical writing techniques that Rautavaara already applied in the *Three Symmetrical Preludes* with more varied textures that allowed the composer to free himself from the restraints of simultaneous mirroring. For the purpose of demonstrating the maturity of Rautavaara’s symmetry writing in this period, this section of the dissertation will discuss *Terssit*, *Tritonukset*, and *Sekunnit* in more detail.

### 4.1.1 *Terssit* (Thirds)

Perhaps Heikinheimo criticized the *Etudit* because he was expecting Rautavaara to follow the virtuosic tradition of piano etudes. Although Rautavaara himself has not mentioned any clear correlation to Debussy’s set of *Études* in 1915, it is hard to imagine that the composer himself would not have noticed that Debussy also used intervals as titles for his set. However, the similarity between them stops at their titles, as treatments of the intervals between the two composers come from completely different perspectives. A quick comparison between the opening bars of *Pour les tierces* and *Terssit* makes the distinction quite obvious:

**Example 4.1:** Comparison of the Etudes in thirds between Debussy and Rautavaara

a) Debussy: *Pour les tierces*, bar 1 – 2

\[\textit{Moderato, ma non troppo}\]

\[\textit{p legato e sostenuto}\]

b) Rautavaara: *Terssit*, bar 1

[Music example image]

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Debussy’s approach of writing parallel thirds for a single hand focuses on the physical technique of executing parallel thirds on the piano. This stems from a longer tradition of writing specific exercises that target technical challenges for pianists, starting with the early pedagogues like Carl Czerny for the sole purpose of teaching. The genre of Etudes later developed into more substantial concert pieces through the works of romantic virtuosos including Frédéric Chopin and Franz Liszt, but without losing the focus on testing the abilities of the performer. Rautavaara’s treatment of intervals, however, leans more towards challenging himself as a composer than the performer. This is perhaps to be expected, as the Etüdít were written shortly after the abandonment of strict serial technique, during the time when the composer was searching for a new compositional language. However, this is not an argument that Rautavaara is against pianistic virtuosity, as he has his own personal struggle on the instrument since his youth (see Chapter 6.2).

The structure of Terssit is in a small sonata-like form, with the exposition divided into the traditional two sections (A: bar 1 – 6; B: 6 – 49), a short development (bar 50 – 63), and a truncated recapitulation with just the first section (bar 64 – 74). Rautavaara avoided the traditional separation between major and minor thirds from the root in triads. Instead of resorting to microtones or new timbres to achieve neutral thirds, he uses both diatonic harmonies simultaneously instead via the means of bitonality. Although major and minor triads themselves contain both major and minor thirds on a note-to-note basis, the way Rautavaara constructs his tertian harmony makes evident that the traditional definition of chords still applies in this context. While keyboard symmetry may not be present in this particular movement, pitch symmetry is the cornerstone of chordal construction by the means of heavy emphasis on major seventh chords throughout Terssit.

As demonstrated in the second prelude from the Three Symmetrical Preludes, bitonality is a byproduct of mirror symmetry. Although the examples here are not necessarily results from mirror reflection itself, the bitonal sonorities here sound very similar to examples when keyboard symmetry does exist. It can thus be considered that Rautavaara derives techniques that are inspired from symmetry and develops them beyond the confines of symmetry itself.

The pairing of two different triads in bitonal harmonies continues from the beginning to the end with few interruptions, and the intervallic distance between the roots of the two chords and their
movements provide the tension and release that is similar to the traditional relationship between consonance and dissonance. In the first six bars, the thirds are presented in stacked ninth and seventh sonorities in both solid chords and sweeping, ascending arpeggios. In Persichetti’s description of ninth chords, he stated that they have polychordal implications and can be analyzed as two separate triads built on top of each other.\(^3\) This is further strengthened with the coexistence of major third and minor third intervals above the bass note, as well as the separation of an octave between two chords in each hand. The result is a stronger sounding bitonal polychord with roots that are also separated by a third. The clash of the major and minor third interval from the root also creates a sharp dissonance of augmented or diminished octave between themselves, making the quality of these polychords a blend of soft consonances and sharp dissonances.\(^4\) The solid seventh chord that follows the initial ninth chord at the outset of Rautavaara’s etude also contains both major and minor thirds, but the sense of bitonality is obscured by the sharing of the same root of E between the hands. This blurred “Doppelgänger chord” demonstrates Rautavaara’s compositional method of using traditional techniques freely and adheres only to what the music itself needs. This “Doppelgänger effect” is later used in his first piano concerto in the form of rapid broken chords underneath a long melodic line, a texture also used in Terssit after the ninth bar.

**Example 4.2:** Rautavaara: Terssit, bar 9-49 (reduction)

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\(^3\) Persichetti, p. 77.

The texture of the music in section B changes to two layers: single, sustaining notes as melody (entering in bar 9) and steady waves of arpeggios around the melodic notes. The bitonal chords alternate between the hands from the bottom to the top end of the keyboard. The reduction above is arranged so that the chords in each staff mark the extremities of the oscillating figures. Matambo considers the texture of sustaining a cantabile melodic line above a busy, sweeping bass line as a style that is akin to Romantic piano writing. Bitonality is still shared between the hands and is labeled as co-existing pairs of harmonies in Example 4.2. The long notes have way too many leaps for a traditional linear melody. Since they are largely chord tones of the underlying harmonies, the movement of this section therefore relies on the vertical relationship between each pair of harmonic blocks rather than on the melody itself. This reversal of roles

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5 Matambo, p. 90.
between melody and accompaniment will also take place in the late work *Narcissus* (see Example 5.7). The harmonic rhythm stays fairly steady in this section, changing every two to three bars most of the time, and only speeds up at the end of phrases in bar 25, 44, and 45. Rautavaara manages to keep each pair of bitonal chords to be separated by a third in most of this section, with only two occasions where the distance between roots is expanded to a fourth (bar 25 and 30-31).

As in a typical development section, this etude draws elements from the exposition. Rautavaara added chords in a higher octave as register contrasts to the solid chords, creating an echo-like answer to the opening motive. In the ensuing rush of bitonal arpeggios (bar 54), Rautavaara uses the gradual expansion of intervals between the bass and the roots of the upper harmonies to create tension that eventually arrives in the recapitulation in bar 64. The roots first start as augmented unisons between B-flat and B-natural. The lower roots then descend downwards to A, G, and F# respectively, while the upper root remains at B. An extra bass is added starting in bar 56, first staying as unison with the root of the lower chord. As the upper chords reach and stay on F#7 and B7 chords, the bass breaks off in a gradual descent of thirds down to lower E before the music abruptly returns to the opening chords as recapitulation.

The sense of bitonality is further strengthened in the last four bars of the Etude. The sense of “Doppelgänger chords” gradually moves to more distinct bitonal harmonies. From bar 72 until the end, the great registral contrast strongly separates the C major and G-flat/F-sharp major chords. It is interesting to note that Rautavaara chose to juxtapose the enharmonic equivalent triads on the score, perhaps as an attempt to avoid associating any tonal references. The distinct sound between these two final chords makes the etude sound unstable towards the end compared to any earlier points in the piece. The suspense provides a more natural transition to the next, more tonally ambiguous *Septimit*.

Example 4.3: Rautavaara: *Terssit*, bar 71 - 74
4.1.2 *Tritonukset* (Tritones)

The “tritones” etude is the shortest one in the entire set. Persichetti claims that the tritone is difficult to classify as either consonant or dissonant, as it can sound either neutral or restless depending on the context. Rautavaara takes full advantage of the ambiguity of this interval in this fourteen-bar etude and presents both possibilities in just the first three bars:

**Example 4.4:** Rautavaara: *Tritonukset*, bar 1 – 4

The first three tritones between the soprano and alto voice occur on the downbeat of measure 1, as well as the downbeat and third beat of measure 2. All of these tritones move immediately to a more stable and consonant interval in the following beat, thus highlighting the restlessness quality of the tritones in a consonant setting. In measure 3, the context changes, as there are continuous unresolved tritones on every beat, creating suspense of movement that renders the tritones neutral and motionless. The horizontal movement of all four voices follows the octatonic scale, with two voices moving upwards and two downwards. As a scale can be formed by any number of major, minor, and augmented seconds in any order, the choice of the symmetrical octatonic scale suits the topic of tritones quite well, since the entire scale is made up of four tritones. The octatonic scale continues in four voices in both hands, as they play parallel open ninths in a steady, contrary motion. The contrary octatonic scale here also shows the inherent compatibility of the scale with keyboard symmetry, as both the outer and inner voices are mirror reflections of each other on the G#3 axis.

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7 Ibid, p. 43.
The opening theme is repeated in the fifth measure in the top voice only, but this time there are additional voices added that moves in parallel with the top voice. The descending middle voice is mimicked with descending parallel tritones. The pairs of dyads in the upper voices are reflections of each other based on the G# axis. Instead of having the middle voice mimicking the top voice in homorhythm, Rautavaara treats it as counterpoint above the bass line.

**Example 4.5:** Rautavaara: *Tritonukset*, bar 5 – 9

One should note that there are no longer any resolutions to the tritones with these additional voices, making the music more static. The bass octaves in bar 5 to 7 as well as in the opening two bars spell out a B diminished seventh chord, which adds an additional layer of tritones underneath, and completes the chromatic collection. The restless quality of tritones with resolutions returns in the eighth bar in a higher octave, with the lower voices now have overlapping tritones and resolutions to overlapping sixths.

**Example 4.6:** Rautavaara: *Tritonukset*, bar 10 – 14

4.1.3 Sekunnit (Seconds)

Similar to *Tritonukset*, this etude is a slower moving and a quieter contrast to the other bravura etudes in the set. The texture of this etude has steady dyads in ostinato throughout the entire movement with only a short interruption in the middle; the melodies are often in short motivic
statements; and wide intervals appear in both solid and broken form. Mirror writing plays a pivotal role in this etude.

**Example 4.7:** Rautavaara: *Sekunnit*, bar 4 – 9

![Musical example](image)

This etude consists of three main voices: outer voices in mostly two-note chords in keyboard symmetry; and steady ostinato chords in the middle. The choice of D♭ and E♭ for the ostinato itself reveals Rautavaara’s intention in creating a symmetry axis on D. The motivic statements of the voices below and above the ostinato are built entirely in pairs of symmetrical notes using D as the axis.

The lower voice states an additive motive that increases in length with each statement. The first long phrase of the etude starts in bar 7. It spans three bars with materials derived from previous motives. The entire phrase (bar 7-9) is a mirror image with the center in ff, while maintaining keyboard symmetry in the outer voices. Horizontally, each melodic line moves in step-wise motion, following the topic of study in this etude. These entire nine measures are repeated with the roles of the outer voices switched after a brief transition in bar 10 and 11. The transition contains the first large intervallic leaps in the piece. Shimmering symmetrical arpeggiation made up of ninths (displaced intervals of seconds) brings the top line to a higher register of the keyboard. This flourishing is symmetrically mirrored in the bass line in bar 20 and 21, just after the return of the opening motives and mirror phrase.
Example 4.8: Rautavaara: Sekunnit, bar 10 – 11, 20 – 21 (inversional symmetry)

The ostinato stops in bar 22 and each strand of the three-layered texture is now reduced to single notes and moves in a slightly more contrapuntal fashion. Rautavaara alternates the quality of the seconds interval in each line and creates an octatonic sonority with the combination of the three lines. The tension from the octatonic scale builds this transition section and texture thickens with an addition of a fourth voice in bar 24. In the following bar, the texture turns to homophonic succession of rising triads that spell out three layers of octatonic scales, a process very similar to the third bar of Tritonukset. The left hand enters the bar afterwards by imitating the right-hand line and adding the texture to six levels of octatonic scales.

Example 4.9: Rautavaara: Sekunnit, bar 22 – 36
The climax of the etude, bar 28, has both hands jumping to the extremities of the keyboard in octaves and chords, all of which are in precise keyboard symmetry between the hands. The ostinato returns in octaves, which quickly reduces to the original two-note chords. The left hand restates the opening motive for the last time from bar 31 to 34, which is answered with echoes in the right hand. The etude finishes in symmetry with a shortened version of the previous arpeggiation figures in both hands and the repeated-note ostinato shared between the thumbs of each hand.
4.2 Piano Sonata No. 1 “Christus und die Fischer”

The title of the first piano sonata is based on a painting of the same name by the nineteenth-century German painter, Ernst Zimmermann. However, the composer claims that the sonata is an abstract work and not a representation of the painting itself:

My attitude was at that time anti-clerical, but a strong, devout and archaic feeling radiated from the picture. The feeling of the sea… and of those faces was the same; timeless, formless - the idea itself just an abstract question. Nothing more, no plot, no story, no proclamation. But there came from the picture this strong sense of its identity.⁸

This practice of giving an abstract piece of music a seemingly programmatic title would become one of the key characteristics in Rautavaara’s music. He had, on multiple occasions, stated that the titles exist as attributes to the original sources of the inspiration and the character of the music in question. The three-movement structure of the sonata is decidedly opposite than that of the traditional format, as the outer movements are slow and the middle is fast. All three movements lack the traditional tempo indications, but are instead marked with precise metronome numbers. Some of the materials in the opening movement are repurposed in the second and third movements, thus making the entire sonata cyclical and unified.

4.2.1 First movement

<table>
<thead>
<tr>
<th>Table 4.2: Rautavaara: Piano Sonata No. 1 – first movement structure</th>
</tr>
</thead>
<tbody>
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<td><strong>Theme</strong></td>
</tr>
<tr>
<td>---</td>
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<tr>
<td><strong>Bar #</strong></td>
</tr>
<tr>
<td><strong>Tempo</strong></td>
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<td><strong>Characteristics</strong></td>
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<table>
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<tr>
<th>TT1 9</th>
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<th>Transition 2</th>
<th>TT3</th>
<th>Coda</th>
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<tr>
<td>42-47</td>
<td>48-59</td>
<td>59-60</td>
<td>61-68</td>
<td>69-73</td>
</tr>
<tr>
<td>I</td>
<td>III</td>
<td>III</td>
<td>III</td>
<td></td>
</tr>
<tr>
<td>Parallel chords &amp; variation on the rhythmic motive of A</td>
<td>Theme A with new ostinato bass based on symmetrical chords (from transition I)</td>
<td>Immediate symmetry; harmonies based on transition I (continues toward TT3)</td>
<td>Variation &amp; fragmentation of the rhythmic motive above ostinato figures</td>
<td>Clusters as cadence (B♭ to E♭)</td>
</tr>
</tbody>
</table>

**Example 4.10:** Rautavaara: *Sonata No. 1*, first movement, bar 1 – 10, 27 – 31

a) Bar 1 – 10 (theme A):

![Example 4.10: Rautavaara: *Sonata No. 1*, first movement, bar 1 – 10, 27 – 31](image)

b) Bar 27 – 31 (theme A mirror – axis on D):

![Example 4.10: Rautavaara: *Sonata No. 1*, first movement, bar 1 – 10, 27 – 31](image)

The opening movement is through composed, and the sections are clearly marked with three different tempo indications (Tempo I at quarter note = ca. 72; Tempo II at quarter note = ca. 84; and Tempo III at quarter note = 100-104) but in actuality there are only two principal thematic elements. Moreover, as the movement progresses, the separation between the two thematic materials gradually breaks down and the various elements such as the rhythmic motive, as well as both bilaterally and intervallically symmetrical chords, are reinterpreted and gradually fuse together into new materials. This poses a problem with the traditional approach of music

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9 Thematic transformation (TT).
analysis, particularly in a highly structured format of a sonata. There are two basic thematic materials that are first stated and then reflected in mirror symmetry later on (compare the two excerpts in Example 4.10). Brandon Paul identified this relationship as “deferred symmetry”. This is a trait that was not present in Rautavaara’s previous piano works until the sixth Etude, Sekunnit (Seconds), written a year earlier.

Example 4.11: Rautavaara: Sonata No. 1, first movement (rhythmic motive and its transformations)

a) Bar 2:

b) Bar 42 – 43 (augmentation & addition of triplets):

![Example 4.11a](image1.png)

Cantabile

c) Bar 62 – 64 (extended long note and displacement of downbeat):

d) Bar 67 – 68 (fragmentation):

e) Bar 70 – 71 (further augmentation with addition of a second long note):

Theme A consists of two important source components that form the basis of thematic transformations throughout the movement: parallel harmonies and the rhythmic motive of one dotted quarter note plus three eighth notes. Rautavaara also used parallel chords as the main theme in the first movement of his second published piano work The Fiddlers (1952), as well as

10 Paul, P. 94.
two movements from *Icons* (1955): III) “The Black Madonna of Blakernaya”; and V) “The Holy Women at the Sepulcher”. The rhythmic motive would gradually change, first via augmentation of the entire four-note group, then inserting additional shorter notes using acceleration with triplet groups. The motive later undergoes variations that include lengthening the long note, displacing the downbeat on the shorter notes, as well as fragmentations. The second statement of theme A from bar 9 to 16 starts the descending parallel harmonies an octave higher and extends the theme for three extra bars. Note that the mirror of theme A later on reflects only the initial statement of five bars.

**Example 4.12:** Rautavaara: *Sonata No. 1*, first movement, bar 6 – 8

Transition 1:

The structural function of the bars between the first two statements of theme A is debatable. These bars contain elements that foreshadow later sections, such as immediate symmetry that contrasts with deferred symmetry earlier, as well as the establishment of the rhythmic motive from theme A through repetition. However, to state that this section is a new theme would be a rather weak argument, as there is no significant thematic development later on that can be reconnected back to these bars. The bilaterally symmetrical chords in theme B (**Example 4.13**) and the ostinato figures starting at TT2 (**Example 4.15**) can be traced back to the triadic and cluster harmonies here, but they are fragmental inspirations at best.

**Example 4.13:** Rautavaara: *Sonata No. 1*, first movement, bar 17 – 26, 32 – 41

a) Bar 17 – 26 (theme B):
Theme B, in the same tempo II as transition 1, features a technique that Rautavaara already demonstrated in the third movement from his *Three Symmetrical Preludes* – the juxtaposition of keyboard symmetry and intervallic symmetry. The tonally obscure nature of the six-note cluster chord followed by a more conventional extended ninth chord creates a unique harmonic progression that the composer would rely on for many compositions to come.\(^\text{11}\) Starting in bar 21, bilateral symmetrical chords disappear but the bitonality is kept through a series of mostly tertian-based chords in both hands moving independently. The previously uniform sounding ninth chords now sounds separate. This is an example of Rautavaara combining two distinct elements into one to create something new. The last three bars of theme B consist of a brand new texture: parallel single-note melodies two octaves apart in each hand.

\(^{11}\) One can also argue that the six-note cluster chord is intervallically symmetrical (m3-M2-M3-M2-m3), but this analysis will involve deemphasizing the bitonal nature of these chords by considering these notes as a single cluster harmony. This author believes that the duality of symmetry in Rautavaara’s music is very important and cannot be overlooked.
Example 4.14: Rautavaara: *Sonata No. 1*, first movement, bar 42 – 45

Thematic transformation (TT):

Until TT1 in bar 42, the rhythmic motive is only present in theme A and transition 1 and remains unchanged. Even though the six bars of TT1 musically function as a buildup to a much more dramatic TT2 in tempo III with new ostinato texture, the first change to the rhythmic motive is significant enough to consider this as the first real thematic transformation. The quintal harmony in theme A is also present in TT1, now moving in the parallel ascending direction.

Example 4.15: Rautavaara: *Sonata No. 1*, first movement, bar 48 – 53

Thematic transformation 2 (TT2):

The familiar texture of ostinato bass in the form of broken arpeggio with long, drawn-out melody on top is one of the most recognizable traits in Rautavaara’s music. It is present in almost every
major piano composition since *The Fiddlers*\(^{12}\) until *Mirroring* (2014), with the exception of experimental works such as the proto-serial *Seven Preludes* (1956) and the two works involving extended piano techniques, *Music for Upright Piano* (1976). The melody is an augmentation of theme A in its original, unreflected quintal harmonies. The left-hand arpeggio figures consist of a B♭ pedal as a downbeat of every bar, followed by four-note harmonies that are mostly based on intervallically symmetrical halves. For example, the first chord in bar 48, F-G-B♭-C, can be observed with intervals of M2-m3-M2 between each note, or as overlapping P4 (F-B♭; G-C). Bar 49 has one of the two exceptions in the pattern of symmetrical chords in this section (the other in bar 56). It is perhaps chosen to avoid harmonic conflict with the right hand melody.

**Example 4.16:** Rautavaara: *Sonata No. 1*, first movement, bar 57 – 63

TT1 ending, Transition 2, and TT3:

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\(^{12}\) The second movement, “Kopsin Jonas,” from *The Fiddlers* is, strictly speaking, the first example of ostinato texture in Rautavaara’s piano music, even though it is in the form of having the right hand part being the ostinato and the left hand as the melody. The texture of having the right hand as the sweeping melody is more prominent in his Neo-Romantic works, starting with “Terrsit” from the *Etudes*. 
Bitonality returns in bar 58, when the cycle of broken chords are now based on E-F-A#-B and F-G♭-B-C. What is remarkable in these two chords is that they are not only intervallically symmetrical by themselves just like most of TT1, but they are also bilaterally symmetrical reflections of each other (and still with respect to the pitch D, but in various octaves). The six-note keyboard symmetry harmonies from theme B in the middle of bar 59. The second transition lasts for two bars and leads into TT3, where the ostinato figure continues in bilaterally symmetrical harmonies that gradually increase in the span of the keyboard with each new chord. The right hand receives a new melody that is based on a variation of the rhythmic motive mentioned above. The fragmentation of the rhythm along with the ascending melody builds up to full cluster chords in bar 69. Rather than writing out specific notes, this is the first instance that Rautavaara asks the performer to play every semitone within the given interval span.

**Example 4.17:** Rautavaara: *Sonata No. 1*, first movement, bar 69 – 73

Coda:
The left-hand harmony here changes back to single harmony in symmetrical halves. The rhythmic motive is restated first in right-hand clusters, and then the left hand joins in for the final statement. The final cluster in bar 72 can only be achieved using both of the performer’s forearms, with the left arm on black keys and the right on white keys. This is then reduced to an E♭ major chord in the last bar by the means of silently holding the chord and releasing the pedal, thus reducing the lingering sound from an atonal cluster to a major chord. This technique can also be seen in the last bar of the final movement in the Fire Sermon sonata. There has not been any significant reference to diatonic chordal progressions throughout the movement. The heavy emphasis on B♭ from the beginning to the final E♭ major chord could be interpreted as Rautavaara’s homage to the traditional perfect cadence.

4.2.2 Second movement

Table 4.3: Rautavaara: Piano Sonata No. 1 – second movement structure

<table>
<thead>
<tr>
<th>Main Structure</th>
<th>Introduction</th>
<th>Exposition</th>
<th>Development</th>
<th>Recapitulation</th>
<th>Coda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sections</td>
<td>Theme A</td>
<td>Theme B</td>
<td>Clusters</td>
<td>Quintal harmony</td>
<td>Theme A</td>
</tr>
<tr>
<td>Bar #</td>
<td>1-5</td>
<td>6-14</td>
<td>15-21</td>
<td>22-31</td>
<td>32-35</td>
</tr>
</tbody>
</table>

The second movement is the only movement in this entire work that is in sonata form. The entire movement is set in a toccata-like texture with the palindromic rhythm pattern of either the basic 3+2+3 or the expanded 3+2+3+2+3. This perpetuum mobile starts immediately at the beginning and continues uninterrupted until a full cluster in the right hand under a fermata in the coda. The sections before bar 49 are separated by harmonic, thematic, and motoric elements. The two main themes in the exposition and recapitulation are taken from the first movement, and can be interpreted as yet further examples of thematic transformations. For an easier reference to their source materials, these themes are labeled with the same name as the previous movement. Both of the theme A sections here take the same melody from theme A of the first movement, while theme B retains the juxtaposition of keyboard and intervallic symmetry.
Example 4.18: Rautavaara: Sonata No. 1, second movement, bar 1 – 4

Introduction:

The opening introduction contains two elements: clusters in the right hand and triadic harmonies in the left hand. The right-hand clusters are asymmetrical and are separated into alternating groups of white keys and black keys. The left-hand chords form a deferred symmetry every two bars, where bar 2 is the mirror of bar 1 and bar 4 reflects bar 3. Even though the pattern does not continue, it should be noted that the two main triads in the opening bar, A major and C minor, are mirror reflections of each other, which creates a dual-layered symmetry between the first two bars.

Example 4.19: Rautavaara: Sonata No. 1, second movement, bar 6 – 9

Theme A:

The parallel chordal main theme from the first movement is broken up to accommodate the new texture in 3+2+3 pattern. The quintal harmony is retained, as well as the emphasis on B♭ in the bass. Theme A is the only material from the opening movement that is quoted in its entirety, and neither of these two themes will receive symmetrical reflections in the second movement. Theme A is repeated in the recapitulation, but is cut short with theme B materials interrupting in bar 44.
Example 4.20: Rautavaara: *Sonata No. 1*, second movement, bar 15 – 18, 44 – 47

a) Bar 15 – 18 (Theme B in exposition):

b) Bar 44 – 47 (Theme B in recapitulation):

Since the original theme B does not have as strong a melodic drive as theme A and focuses instead on alternating progression between the bilateral clusters and intervallically symmetrical tertian chords, it allows the composer to have maximum freedom for development of the material. The first statement of theme B in the second movement is shortened to a motive consisting of just these two types of chords in juxtaposition. The return of theme B in the recapitulation further fragments the motivic material into just the bilateral clusters without the tertian chords. As the theme B material is so drastically reduced, it is therefore questionable whether this part of the second movement should be considered a theme at all. However, just as the gradual fragmentation of the rhythmic motive in the first movement, it is reasonable to conclude that these bars in question are thematic transformations of theme B by means of fragmentation.

Example 4.21: Rautavaara: *Sonata No. 1*, second movement, bar 26 – 29, 32 – 35

Development:

a) Bar 26-29 (clusters with left hand deferred symmetry)
The development section has two parts: black/white key clusters taken from the introduction, and quintal harmony taken from theme A. The deferred symmetry in the left hand does not appear initially in the beginning of development, but returns in bar 26, which is now set in two bars of initial phrase and two bars of reflection. The B♭ pedal comes back with the quintal harmony in bar 32, which sets up a four-bar preparation before the return of theme A in bar 36.

Example 4.22: Rautavaara: Sonata No. 1, second movement, bar 49 – 55

Coda:

The crashing solid cluster in bar 49 puts a sudden stop to the relentless drive of the symmetrical rhythm. The subsequent slower section prepares for the *attacca* for the final movement. The single line melody in quarter notes spells out an octatonic scale, and is cleverly manipulated above the B♭ pedal. The seemingly incomplete scale in the right-hand line actually sounds complete with the lingering sound of the B♭ octave pedal in the left hand, which is then further strengthened and prolonged with an offbeat reestablishment of the octave in bar 52. The clashing B natural in the right hand in bar 53 turns the octatonic mode into a chromatic cluster of every semitone from B to F, broken into three separate minor ninth dyads. The movement finishes in the same manner as the first movement: a full cluster with the forearm, which is then reduced to a tonal chord in E♭ major. Rautavaara once again hints a V-I cadence out of the blue, as there has
not been any significant progression of diatonic harmonies since the reference to cadence at the end of the first movement. The B♭ octave is held into the final movement.

4.2.3 Third movement

Table 4.4: Rautavaara: Piano Sonata No. 1, third movement structure

<table>
<thead>
<tr>
<th>Main Structure</th>
<th>Subject 1</th>
<th>Subject 2</th>
<th>Subject 3</th>
<th>Coda</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bar #</td>
<td>1-5</td>
<td>6-1313</td>
<td>14-19</td>
<td>19-25</td>
</tr>
<tr>
<td>Characteristics</td>
<td>Solo subject on B♭ pedal</td>
<td>Subject on top</td>
<td>Subject in bass</td>
<td>New theme &amp; quote from 1st movement</td>
</tr>
</tbody>
</table>

Example 4.23: Rautavaara: Sonata No. 1, third movement, bar 1–5

Subject and its four fragments:

\[ \text{Example 4.23: Rautavaara: Sonata No. 1, third movement, bar 1–5} \]

The finale of the first sonata can be interpreted as a fugato in three voices with only the exposition section of a fully-fledged fugue and a substantial coda. Since the movement is not set in a diatonic scale, the subject merely repeats three times with no answer in the dominant. The chorale themed subject is first introduced in its entirety over a B♭ pedal in the bass. The second and third statements of the subject are stated first in the right hand and then a second time in the left. It is worth noting that compared to the first two movements, there are no significant symmetrical relationships in the finale before the coda section, save for the voice exchange of the subject and the countersubject from bar 6 to 19, which is similar to an invertible counterpoint that can be found in traditional polyphonic compositions.

\[ \text{The separation of bar lines between the hands poses an issue in counting bar numbers. The bar numbers in subjects 2 & 3 are based on the right-hand line only.} \]
Although the subjects are stated thrice without any variations or abridgements, subject 2 and 3 are marked with *Hauptstimme* brackets throughout, thus fragmenting the subject into four different parts (see Example 4.24). The countersubjects underneath and above also quote these thematic fragments. As the performer is asked to bring out the four fragments, the subject goes through an auditory variation rather than a written one. Since the listener hears the fragments out of order, a new theme emerges in the order of fragments A-C-B-C-C-D. As the attention of the listeners are taken away from subjects 2 and 3 by the newly arranged *Hauptstimme* fragments, it is also possible to argue that the structure of the finale is in a small-scale theme and variations with contrapuntal elements.

Rautavaara also experimented with meter in the last movement, as it is clearly presented by the uneven barlines between the hands. Each of the fragments quoted in the countersubject retained the same order of weak and strong beats as the subject itself. The bar lines remain separated until bar 19, when both hands come back together for the coda.

*Example 4.25*: Rautavaara: *Sonata No. 1*, third movement, bar 19 – 20

**Coda:**

14 Bar numbers based on the right hand part.
The seven-bar coda at the end consists of chords that are made up of stacked fifths as well as quotes from the opening movement’s rhythmic motive in TT1. The intervallically symmetrical chords in the right hand remain until three bars from the end, where they are first reduced to just the outer notes of open ninths, then shrunk to sevenths in bar 24. Since the beginning of the sonata, the bass has repeatedly emphasized B♭ through either repetition or a long pedal with only brief interruptions. Though the first movement finishes in E♭, B♭ returns in theme A of the second movement, which continues well into the finale. However, the bass changes to a G minor chord in the coda, which functions as the new tonic as the music draws to an end. Since the entire sonata is in a tonally ambiguous setting, the clear-cut nature of the G minor ending is significant, as the listener finally hears the true harmonic function of the heavily emphasized B♭ since the beginning.

4.3 Summary of Symmetry in Neo-Romantic Works

As mentioned in Chapter 2, the relationship between serial pitch organization and symmetry is evident in the nature of the matrix itself. In regard to Rautavaara’s ten-year serial experiment, Brandon Paul identified pitch symmetry to be the “primary source of generation for material through his first serial period of composition.” As the composer grew disillusioned with the dry and laborious calculations required in dodecaphonic writing, he went back to some of his earlier styles of composition in search for new solutions to the cause of his first compositional crisis he had in the first place – the lack of a reliable and convincing technique to develop musical materials. The outcome of this new compositional direction showed that not only did Rautavaara hold on to the constructivist element of symmetry itself, he relied on it even more than before. As demonstrated in all of the solo piano works during the neo-romantic period, symmetry plays an integral role in thematic and motivic developments. Even during this period, Rautavaara made attempts to create synthesis between the various compositional techniques he acquired through the years. Much of the symmetrical writings in this period are continuations from the traits found in the early works (see Chapter 3.4). Some of the newer characteristics of symmetrical writing in this period include:

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15 Paul, p. 93.
1. Free use of simultaneous and delayed symmetry that best fit with the music
2. Independent symmetrical movements between hands (varied texture)
3. Clusters divided between black and white keys (keyboard symmetry with chromaticism)
4. Use of symmetry-inspired techniques without symmetry itself
   a. Bitonality
   b. Stacked chords in either major or minor sevenths or ninths
5. Continuous reliance on $3 + 2 + 3$ rhythmic patterns

In the final section in Paul’s article, he identified the pitch collections found in Rautavaara’s 
*Cello Sonata No. 1* (1972-73) and *Ballade for Harp and Strings* (1973) to be that of keyboard symmetry. This demonstrates that the maturing composer was interested in cultivating the specific combinations of harmonies derived from keyboard symmetry outside of the keyboard instrument as he searched for his own unique sound, and a true synthesis between the visual and auditory aesthetics.
Chapter 5
Late Works

5.1 Narcissus (2001)

In February of 2015, Ville Komppa from the Finnish Broadcasting Company (Yle) interviewed Rautavaara in his home, where they discussed the composer’s various projects at the time as well as recurring themes in his compositions. Rautavaara disagreed with the popular viewpoint that he jumps back and forth between different styles throughout his composition career. He insisted that there are repeating features in his music that have been present even in his early works. The interview continued with the discussion of the composer’s fascination with angels, which appeared in the titles of many of his works. As observed in the earlier chapters, symmetry is yet another characteristic that lasted even longer than the inspiration of angels. This has support from the composer himself in various accounts, that one can only imagine what the composer would have said had the interviewer presented this question.

Rautavaara was commissioned to write a test piece for the 2002 Maj Lind Piano Competition. The resulting piece would be the first piano work in twenty-five years, and it celebrates the composer’s lifelong love for symmetry. The name, Narcissus, may seem to be a reference to the Greek mythology. It is, in fact, a self-ironic label, in that it proclaims the composer’s own love for symmetry:

The set piece for the Maj Lind Piano Competition was the outcome of my love for symmetry. Since the year, 2002, was so beautifully symmetrical, I just had to agree to do it. (The ideal would, of course, have been 20.02.2002, but that would have been too much to ask.) Symmetrical scales, inversions of melodies and mirror harmonies have in fact always been typical of my music.

Nevertheless, Matambo still speculated about a possible story-telling element in the music related to the original myth itself at a subconscious level. She argues that parts of the music that

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1 Rautavaara on ihmetyttänyt se, että hänen musiikkinsa pidetään monenkirjanava–että hän hyppisi tyylistä ja tekniikasta toiseen. Hänen mielestään se ei pidä paikkaansa. Tietystyypilliset píirteet toistuvat hänen musiikissaan, ja monet niistä ovat olleet länää jo hänen ensimmäisissä teoksissaan. (Komppa 2015)

2 Rautavaara (2002).
hint of whole-tone scales, ambiguous tonality, and fluid changing meters pay homage to Debussy and possibly depict the image of the water in the myth that Narcissus gazed upon at his own reflection. Performer’s interpretations aside, this piece mainly demonstrates the constructivist side of the composer with its attempts of reintroducing serialism in the form of synthesis with neo-romantic sentiments.

5.1.1 Formal structure

Table 5.1: Scott’s structural analysis of Narcissus

<table>
<thead>
<tr>
<th>Section</th>
<th>Introduction</th>
<th>Exposition</th>
<th>Development</th>
<th>Recapitulation</th>
<th>Coda</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Theme A</td>
<td>Theme B</td>
<td>1</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Bars</td>
<td>1-16</td>
<td>17-19</td>
<td>21-26</td>
<td>47-89</td>
<td>90-99</td>
</tr>
</tbody>
</table>

Kimberly Scott argued that Narcissus could be analyzed as a slightly altered sonata form. This is certainly not a new trait for Rautavaara, as his two piano sonatas also structurally deviate from the traditional definition of the sonata form. However, this interpretation ignores some of the recurring thematic materials within each large section. It is thus more helpful to interpret the structure of Narcissus in terms of thematic groups, in which case the work comes closer to a rondo form than sonata form. The most significant theme group is theme B, which undergoes five different statements throughout the piece, and each of them after the initial statement (bar 17-20) can be considered a variation.

Table 5.2: Rautavaara: Narcissus thematic sections

<table>
<thead>
<tr>
<th>Theme</th>
<th>A</th>
<th>B</th>
<th>A1</th>
<th>B1</th>
<th>B2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bars</td>
<td>1 – 16</td>
<td>17 – 20</td>
<td>21 – 27</td>
<td>28 – 34</td>
<td>35 – 40</td>
</tr>
<tr>
<td>Characteristics</td>
<td>6-note motive in bilateral symmetry; B♭ pedal</td>
<td>Synthetic scales in 4-note groups under a new melody</td>
<td>“Melody” that accompanies above the 6-note motives</td>
<td>Mode 2 and 6 scales above theme B melody</td>
<td>Climax; theme B melody in full chords above symmetrical chords</td>
</tr>
</tbody>
</table>

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3 Matambo, p. 114.

4 Scott, p. 144.
5.1.2 Compositional process

In her research on *Narcissus*, Scott was able to gain access to unpublished fragments of Rautavaara’s compositional drafts and fragments. These sketches revealed the central element of the compositional process and detailed the tone row system that Rautavaara initially planned for this piece. Despite the composer’s efforts in realizing the tone row into a fully functioning matrix, the final published score is not in a strict dodecaphonic technique, but tonally ambiguous and closer to the modal writing that is along similar lines as his other piano works from the Neo-Romantic period all the way through his last work, *Mirroring*, in 2014. The main element of *Narcissus* consists of six pitches, which were chosen from the letters in “Scottish Chamber Orchestra” (SCHABE), or E♭-C-B-A-B♭-E. Rautavaara’s first effort at generating symmetry is by arranging six pitches in the second hexachord in the exact same intervallic order in almost a perfect inversion: D-F-F#-G♯-G-C#. Then he arranged the second hexachord in retrograde to form interval mirroring: C♯-G-A♯-G♭-F-D:

\[ 3 \rightarrow 1 \rightarrow 2 \rightarrow 1 \rightarrow 6 \rightarrow (3) \rightarrow 6 \rightarrow 1 \rightarrow 2 \rightarrow 1 \rightarrow 3 \]

**Example 5.1:** Rautavaara: *Narcissus* draft, SCHABE tone row

a) First version in almost perfect intervallic inversion

\[ \text{\includegraphics[width=10cm]{example5.1.png}} \]

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5 Ibid., pp. 138 – 141.

6 This tone row would be in perfect intervallic inversion if the last C# is in a lower octave. It is unknown why Rautavaara chose to write the last pitch in a higher octave in his sketch.
b) Second version in intervallic mirroring (second hexachord in retrograde)

Rautavaara then took the tone row one step further and developed what he called a “dominant” set with similar process of intervallic inversion and mirroring just like the SCHABE row: E♭-G♭-B-A-E-B♭-A♭-F-C-D-G-C#. The first hexachord in the subsequent versions are respelled as D♯-F♯-B-A-E-B♭ and reorganized in pitch registers.

**Example 5.2:** Rautavaara: *Narcissus* draft, “Dominant” set

a) First version with inversion

b) Second version with first hexachord respelled and reorganized; second hexachord in retrograde

c) Final version with some more respelling and reorganizing

The sketches also revealed the compositional evolution from the idea of the tone rows, as the composer also included a modified version of the SCHABE row to form a cyclical melody that contains both intervallic inversion and retrograde:

**Example 5.3:** Rautavaara: *Narcissus* draft, Modified SCHABE row

Scott pointed out the final version in the music is perhaps found in bar 12 to 13, but the row is once again changed, this time focusing on keyboard symmetry:

**Example 5.4:** Narcissus, bar 12-13

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Although Rautavaara initially sketched out the complete set of matrices from the two tone rows, the published score shows only faint resemblance to these drafts, as the nature of tone rows limits the possibilities of symmetry to just pitch-based intervallic mirroring. Concessions had to be made to involve bilateral keyboard symmetry, in which the result always leans toward modal writing. This specific example shows resemblance to the original SCHABE row, but the pitches F#/G♭, A#/B♭, and D were repeated for the keyboard symmetry to occur in complementary three-note groups. This changes the piece from the original intention of serialism to chromatically inspired mixed scales and polychords. The two sets of matrices from the sketch can thus be considered as two among the various other compositional tools that ultimately contributed to the final score of Narcissus.

5.1.3 Analysis

Example 5.5: Rautavaara: Narcissus, bar 1 – 2 and bar 8

Motive from A

a) Bar 1 – 2

b) Bar 8

The original tone rows are transformed into six-note motives in the final score, which itself grows from four notes from the opening. The principle behind this motive is to have both hands play in complementary keyboard reflections of each other. The continuous motive remained a significant motoric material throughout section A and gradually transforms into mixed scales in four-note groups starting in the sixteenth measure and into section B, where the recurring melody is first introduced. The scale pattern in the left hand in bar 17 and 18 is a mixed scale in keyboard symmetry with relatively free combinations of semitones and whole tones: D – E♭ – F
–F# - G# - A# - B – C# - D. Persichetti calls this treatment as synthetic scales, in which these intervals can be freely placed in any order. ⁷

**Example 5.6:** Rautavaara: *Narcissus*, bar 15 – 18

End of section A transitioning into B

a) Bar 15 – 18:

b) Synthetic scale in keyboard symmetry starting in bar 17:

While the entire section A mostly consists of bilateral symmetrical broken triads, the free flowing synthetic scales in section B can be interpreted as a transition into an octatonic and mode six scales in B₁. However, the transition is interrupted by a brief return of bilateral symmetry in A₁, though much less stable and consistent compared to the beginning. The long, sustained melody in the upper line in A₁ is a typical characteristic in Rautavaara’s music.

**Example 5.7:** Rautavaara: *Narcissus*, bar 21 – 27:

Section A₁

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The motoric pattern gradually turns into scalar patterns toward the last beat in bar 25. The ensuing pattern of three-note groups in semitones resembles the incomplete mode six scales used throughout Mirroring (to be discussed later in this chapter), where certain notes from the mode are specifically omitted to retain only semitones and exclude whole-tone relationships (see Examples 5.14 and 5.15).

Example 5.8: Rautavaara: Narcissus, bar 29 – 30:

Section B1
The synthetic scales finally settle to a stable pattern of octatonic scales in section B1, where the main melody is stated in the middle voice, accompanied by bass pedals in the form of symmetrical major seventh chords. The upper scale gradually turns into mode six in bar 32. Meanwhile, instead of repeating the original melody, the middle voice lengthens and transforms it into a buildup towards the climactic peak of the piece in bar 35.

**Example 5.9:** Rautavaara: *Narcissus*, bar 35 – 36:

Section B2

The grandiose climax consists of the section B melody in full chords with occasional added sixths for a cluster-like effect that is common in his Neo-Romantic works such as the first concerto and the two sonatas. Rautavaara utilized similar symmetrical chords in earlier works to accompany the melody, namely chords with intervallically symmetrical halves and major seventh chords. The melody in the second statement of section B in bar 41 is reduced to single notes, while the motoric pattern continues in an octatonic scale before transitioning into the calmer section C in symmetrical dyads.

**Example 5.10:** Rautavaara: *Narcissus*, bar 45 – 49:

Transition and Section C
The continuous motoric drive of broken chords and running scales comes to a grinding halt in section C, the largest thematic section in the piece. The function of section C is similar to that of a slow, contrasting movement in a sonata, with a polyphonic texture in three voices split into three staves for most of the section. Keyboard symmetry here is presented in alternating dyads in the middle staff, a technique that can be seen as early as the second prelude from the *Three Symmetrical Preludes* (see Example 3.6). The brand new melody here is more ornamental, and interweaves between the top two lines. The melody here shares a similar trait to the one in A1, in that the pitch material is less important compared to a more conventional melodic subject seen in B. Thus the rhythmic motive plays a more prominent role as the section develops. Symmetry gradually disappears as the texture thins in bar 61, in which the alternating eighth-note accompaniment is reduced to single notes. A new motive is introduced here, which quickly becomes fragmented towards the end of the section and combines with the irregular note groups from the first motive in bar 48.

**Example 5.11:** Rautavaara: *Narcissus*, bar 62 – 63:

The bars leading up to the fourth variation of B restarts the motoric scalar runs using a series of irregular note groups derived from bar 48. B4 sets the melody underneath a torrent of mode six scales. Towards the return of section A at the end, Rautavaara combines the two prominently featured symmetrical scales for the first time in a true “polymodal” fashion, where the left hand
in octatonic mode joins the right hand in mode six in rapid descending scales. The brief return of keyboard symmetry in the returning A does not last long, as mode six scales quickly interrupt the mirroring motive and trail off at the end, marked with *al niente*.

**Example 5.12:** Rautavaara: *Narcissus*, bar 99 – 102:

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5.2 *Mirroring* (2014)

Rautavaara’s final composition for solo piano was written in 2014 as a commissioned piece for the Fourth Hong Kong International Piano Competition, which was scheduled to take place later that year between October 10th and 27th. However, due to the political instability in the city during the “Umbrella Movement” throughout the fall, the competition was postponed to September of 2016. Nevertheless, this unforeseen circumstance did not postpone the premiere of this piece. As a gesture of gratitude to the supporters and sponsors, the host of the competition – The Chopin Society of Hong Kong Ltd. – presented three “Thank You Recitals” from October 24 to 26 given by the three First-Prize winners of the previous installments of the competition. *Mirroring* received its world premiere as an encore by an Italian pianist, Giuseppe Andaloro, at the Hong Kong City Hall on October 26, 2014.⁸

Relatively little information is currently available regarding either the compositional process or the composer’s own comments on *Mirroring* before his passing in the summer of 2016.

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⁸ Liang, October 2014.
According to the existing records from the printing department of Boosey & Hawkes, *Mirroring* was submitted for publication in July of 2014. Rautavaara’s latest biography by Samuli Tiikkaja, published in August of the same year, does not contain information on this piece due to the relatively close timing to the completion of this work. There was a passing comment on this piece as one of Rautavaara’s numerous new compositions in Komppa’s interview in 2015, when he summarized the importance of symmetry in Rautavaara’s compositions throughout his life.9

The small size of this ninety-five bar work is in line with his other three late piano miniatures, *Narcissus* (2001), *Passionale* (2003), and *Fuoco* (2007). The title, *Mirroring*, is a more descriptive title of the actual structure and compositional focus of the piece rather than an interpretation of character and mood like the previous three pieces. As with his other works for solo piano, symmetry is an integral part of this composition. There are also other types of “mirroring devices” used, such as inversion without strict bilateral or intervallic symmetry, as well as inversions between white and black keys. The latter kind is only found in the form of cluster chords played with the palm or forearm in Rautavaara’s earlier piano pieces, and is treated more or less as an effect. As will be discussed later in the chapter, the black/white key inversion is utilized as an important structural device that displays one of the many types of “mirroring”. Through Kimberly Scott’s discussion on the work *Narcissus*, she demonstrated Rautavaara’s desire for a multi-layered and complex method of composition by reintroducing the constructivist elements from his earlier periods.10 This tendency continues in *Mirroring*, and Rautavaara was able to achieve a more fluid and natural synthesis between the Neo-Romantic gestures with controlled constructivism through clever manipulations of the otherwise very rigid nature of symmetry.

5.2.1 Formal structure

<table>
<thead>
<tr>
<th>Section</th>
<th>A</th>
<th>Transition</th>
<th>B</th>
<th>A1</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bars</td>
<td>1-6</td>
<td>7-9</td>
<td>10-21</td>
<td>22-32</td>
<td>33-41</td>
</tr>
<tr>
<td>Tempo (M.M. in quarter notes)</td>
<td>Animato (80)</td>
<td>-</td>
<td>Pesante (88)</td>
<td>Capriccioso (120)</td>
<td>Scherzando (52)</td>
</tr>
</tbody>
</table>

9 Komppa, 2015.

10 Scott, pp. 137-143.
The structure of *Mirroring* once again demonstrates Rautavaara’s innate creative ability to combine different traditional forms. It contains traits of a sonata, theme and variation, as well as rondo. Similar to earlier discussions of his other works, it is best to divide the piece into separate thematic groups and observe their connections for various possible interpretations rather than forcefully fitting them into a single pre-existing mold. The sonata form interpretation would group section A, transition, and B together as the exposition; A1 through E for development; and A3 to B2 for recapitulation. However, the only identifiable motivic material that goes through any sort of development is the fast triplet figures in the various reiterations of theme A, though none of them are exactly alike and they can also be interpreted as different variations of one another.

It is also possible to perceive the piece as a small-scale theme and variation set, as each variation has its own tempo and metronome marking. However, it would not take long to notice that there are no traceable melodic materials that can be identified as a “theme” in the traditional sense. The only way for theme and variation to work in this piece is to consider the entire concept of bilateral keyboard symmetry itself as the main theme, and each section of the piece functions as connected variations of “mirroring”. As the fast triplet runs occur between each subsequent new theme (except between C and D), they serve as the only common rhythmic material that holds the piece together. Despite these triplet sections being all somewhat different from one another, the *perpetuum mobile* texture itself is striking enough to be an identifiable trait to the listener, thus allowing the piece to be interpreted as a rondo form.
5.2.2 Thematic materials

Example 5.13: Rautavaara: Mirroring, bar 1 – 2:

Section A

The opening figures consist of a collage of symmetrical relationships and mirroring devices. Whether it is analyzed in smaller groups by looking at each set of triplets as reflective dualities, or by grouping them together into scales, symmetry is present in both levels. Each of the small groups contains two related sets of triplet sixteenth notes that alternate between two aspects of mirror reflections. The first and third groups of each bar are inversions between black (B) and white (W) keys. Similar to positive and negative images in film, the first set of triplets – BWB – is answered with WBW in the second set. The second and last beat of each bar is the familiar bilateral keyboard symmetry between the two sets of triplets. The reflective axes of D and G# are less rigid compared to earlier works and switch back and forth from one group to another. As will be seen later in the analysis of this piece, the axis can change within the same harmonies between hands by simply displacing one hand by an octave. The two alternating devices – inverting black/white keys and bilateral keyboard symmetry – create a three-dimensional mirroring image of the keyboard.

Example 5.14: Types of keyboard symmetry in opening bars of Mirroring

a) Black/White key inversion (first and third beats of bar 1)
b) Keyboard symmetry (second and last beats of bar 1)

In Scott’s discussion of Rautavaara’s *Three Symmetrical Preludes*, she suggested that Rautavaara might have been aware of Messiaen’s sixth mode already in his student years based on the incomplete mode in the third bar in the first prelude (see *Example 3.1*). The chromatic triplets in *Mirroring* resemble the incomplete scale from the earlier work, and it is also manipulated to make the triplets appear as freely chromatic. The beginning of this piece can also be interpreted as the composer taking the mode – C#-D-D#F-G-G#-A-B – and dividing it into four overlapping semitone and whole-tone groups:

1. C#-D-D# (semitone)
2. D#-F-G (whole tone)
3. G-G#-A (semitone)
4. A-B-C# (whole tone)

*Example 5.15: Intervallic symmetry in mode 6 scale*

In order to maintain a consistent chromatic triplet pattern throughout section A, Rautavaara chose to omit the notes F and B to avoid any whole-tone relationships. The subsequent pairs of triplets work in similar fashion, where six out of eight notes from the mode are chosen to form two sets of chromatic triplets.
**Example 5.16:** Rautavaara: *Mirroring*, section B chordal reduction, bar 10 – 21

Left hand part in blocked chords; right hand part unchanged

Downbeat of every bar is a symmetrical chord to the left hand accompaniment

Section B consists of the familiar neo-romantic texture of rapid arpeggio ostinato figures in a slow harmonic rhythm accompanying a drawn-out melody in solid chords in the right hand. Symmetry occurs in two levels in this section. Keyboard mirroring takes place on the downbeat of every bar, where each chord in the right hand reflects the chords in the left hand. Rautavaara treated the symmetry with a lot more freedom by using passing chords in the melody, which in turn creates a horizontal line. With the exception of the passing chords in the right hand on the weaker beats, each of the downbeat chords in each hand is made up of a pair of symmetrical dyads: two pairs of perfect fourth intervals within the span of an octave, making them intervallically symmetrical by themselves. The first two harmonies, D-G-A-D in bar 10 and G#-C#-D#-G# in bar 12 are even bilaterally symmetrical by itself, which subsequently makes the right-hand reflection to be the exact same chord. The downbeats of these two bars thus have a three-fold mirror reflection of the keyboard on top of intervallic symmetry. As the harmonies in each hand move away from the D and G# axis starting in bar 13, bitonality starts to be audible with each corresponding right hand reflection.

The fast triplet pattern returns in bar 22 with symmetrical responses alternating between hands similar to the opening. Both A1 and A2 sections are built on an uneven rhythm. Rautavaara highlighted this by means of beaming his notes to show the third rhythmic group of each bar as the asymmetrical one. Rautavaara was known for using uneven rhythmic groupings in his earlier works from *The Baptism of Christ* in *Icons* all the way to *Fuoco*, but they are almost exclusively
set in a symmetrical 3+2+3 or the expanded 3+2+3+2+3 pattern. The uneven rhythmic patterns in *Mirroring*, however, are decidedly asymmetrical with 2+2+1+2 (or 4+4+2+4 in sixteenth notes) in A1 and 3+3+2+3 in A2. Unlike the other examples of uneven ostinato rhythmic motives, the example in A1 is deliberately obscured by triplets, thus making this pattern more of a rhythmic variation of section A.

**Example 5.17**: Rautavaara: *Mirroring*, bar 22, 42 – 43, 53 – 54, and 76

Symmetrical cluster chords
a) A1 (Bar 22):

![Example 5.17a](image1)

b) D (Bar 42 – 43):

![Example 5.17b](image2)

c) A2 (Bar 53 – 54):

![Example 5.17c](image3)

d) A3 (Bar 76)

![Example 5.17d](image4)
e) Reductions of symmetrical clusters from A1, D, A2, and A3

It is also worth noting the construction of the mirroring harmonies starting in A1, which continues through section D, A2, and A3 (see Example 5.17e). Each chord consists of a fifth with an added second in the middle. In the specific examples found in Mirroring, this creates a cluster in the middle of the larger chord when paired with its reflective counterpart. This cluster can be traced back as early as the second prelude from Three Symmetrical Preludes (see Example 3.10), of which the chromatic seconds are placed on the outer part of the larger chord. Another variation of the similar chord is found in the first movement of Sonata No. 1, where the open interval is a fourth instead (see Example 4.13). The individual clusters in each hand also resemble the chords found in section B, only without the octave doubling. Open dyad with added second has already been mentioned in Example 2.14 as one of the common symmetrically constructed harmonies by Rautavaara, and all of these chords can be interpreted as an inversion of either an open quintal or quartal chord. Another unifying factor between sections A1, A2, and A3 is the fact that they all start with the exact symmetrical harmony between the hands.

Example 5.18: Rautavaara: Mirroring, bar 33 – 34, 38 – 39

Section C and its symmetrical reflection
a) Bar 33 – 34:
Like section B, section C is in a melody and accompaniment texture, although the melodic line in the latter section is ornamented and the accompaniment consists only of repeating solid chords. The harmonic rhythm is exactly one bar long regardless of the time signature. Each of the harmonies has its mirror reflection in the melody, which consists of only chord tones from the reflective chord. In bar 33, the left-hand harmony: D-F-G♭-A is reflected across the G#/A♭ axis in the right hand (overlapping the thumb note in each hand) as G-B♭-B-D. Bar 34 is likewise reflected between C#-E-F-A♭ in the left and A♭-B-C-E♭ in the right. The fluid change of mirroring axis between D and G# can be observed here when the ornaments travel from one octave to the next. Starting in bar 38 until section D, the hands switch roles, where the melody, now in the left hand, travels downwards. The second half of section C is also an exact mirror inversion of the first half, as the harmonies between the hands are kept, albeit somewhat disguised as certain notes are spelled differently – G♭ in bar 33 is changed to F# in bar 38, and G# alternates with A♭ in bar 38.

**Example 5.19:** Rautavaara: *Mirroring*, bar 46 – 47

Section D inversional symmetry

The immediate symmetry in section D has the closest resemblance to the *Three Symmetrical Preludes*. Apart from occasional flourishes that temporarily interrupt the continuous flow of mirroring harmonies and their inner voices, the section is mostly homorhythmic with both hands
moving simultaneously in contrary motion. In bar 42, Rautavaara was clearly thinking of a larger ensemble in this section, as the symmetrical dyads could have continued during the ornamental passages, but has to compromise due to the limitations of the average pianist’s hand spans. The delayed inversionsal response in the bass in bar 47 is the same technique used in bars 10 – 11 and 20 – 21 of Sekunnit (Example 4.8). This technique can be traced back to the inversionsal symmetry in Bartók’s music, where the initial motive and its inversion is set up as call and response:

**Example 5.20:** Bartók: *Sonata for Two Pianos and Percussion*, second movement, bar 5 – 6, 9 – 10

\[\text{a) Bar 5 – 6 (Piano I):}\]

\[\text{b) Bar 9 – 10 (Piano II):}\]

Apart from the Bulgarian rhythm mentioned earlier, A2 incorporates a new mirror symmetry texture previously unseen in the composer’s piano works: similar motion between hands. Since the *Three Symmetrical Preludes*, Rautavaara introduced new textures that incorporate mirror symmetry in his work, but *Mirroring* is the first and the only time that the composer used similar motion within the confines of mirror symmetry. Each hand is confined to the same type of chord mentioned in A1. The left hand is in a regular broken arpeggio, while the right hand reorders the pitches in the reflective chord to match the direction of the left hand. The only places where each left hand note is immediately reflected are the downbeat eighth note and the entire last group of three of each bar, for which contrary motion returns. The right hand also incorporates an independent upper voice that spells out a mode 2 scale starting on E.

**Example 5.21:** Rautavaara: *Mirroring*, bar: 63 – 67

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The last slow section of the piece is set in a loose canon, where the right hand imitates the left-hand chords in deferred symmetry. Section E consists of parallel triadic harmonies that move mostly in whole tones. Keyboard symmetry completely disappears for the first time in the piece in bar 69 and does not return until the middle of bar 73. The overall harmony between these bars transforms from bitonality to the familiar extended tertian harmonies of major sevenths and ninths, which, as discussed in earlier chapters, are intervally symmetrical.

Example 5.22: Rautavaara: *Mirroring*, section A3 reduction, bar 76 – 90

The return of keyboard symmetry in bar 73 transitions section E into sections A3 and B2, which can be interpreted as a coda of the piece. The fast triplet patterns in A3 returns to the regular even sets of triplet sixteenth notes. The piece reaches to its final climax in B2 (bar 91) through a

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11 In page 6 of the actual score, the right-hand harmony in the last beat of bar 77 is written with E as the top note. As the entire section is in strict mirror symmetry with no other exceptions, the author therefore believes that this is likely a mistake and should read D instead.
gradual build up throughout A3 by means of dynamic changes and acceleration of harmonic rhythm from static drone to a new harmony every quarter note beat. The movement of the three-note chords in each hand once again spells out the octatonic scale in bars 80 to 81 and 88 to 90.

**Example 5.23:** Rautavaara: *Mirroring*, bar 91 – 92

Section B2 from bar 91 has the same melody and accompaniment texture as B, though the melody itself bears no resemblance, and neither do any of the harmonies repeat. The melody here is a lot more agitated in comparison and the overall section is truncated to just five bars. The piece abruptly closes as the momentum stops on a D chord in each hand at the beginning of bar 95, followed by a barrage of broken chords toward the lower end of the keyboard, finishing on D and establishing the axis as the “tonic” of the entire piece.

**Example 5.24:** Rautavaara: *Mirroring*, bar 95
5.3 Summary of Symmetry in Late Works

*Mirror*ing is among Rautavaara’s last compositions, of which there is only a handful between 2014 and 2015. The composer himself admitted that he found synthesis in his music since the 1970s, yet there are already signs of this effort in his earlier works, as demonstrated through his creative manipulations of symmetry in his music and his ability to break free from its strict confines. Both *Narcissus* and *Mirror*ing show the maturity of the composer in forging the synthesis of constructivism and neo-romanticism in the form of short miniatures. Bilateral keyboard symmetry in Rautavaara’s music went so far beyond Persichetti’s experiments that he was able to transform an inherently visual aspect of the keyboard into a harmonic language that identifies his unique voice among other contemporary composers.
Chapter 6
Symbolism and Pianist’s Perspective

This final chapter includes discussions of the general significance and connection of symmetry to Rautavaara himself as well as his music. A discussion of what symmetry means to the composer in both philosophical and practical senses will be beneficial for the interpretation of his music in general. The chapter is divided into four sections. The aim for the first half of the chapter is to gain a better understanding to Rautavaara’s music by providing a general background of Rautavaara’s personal belief and the role of the piano in his life. Chapter 6.1 looks at the symbolism of symmetry to Rautavaara through his perspective on the role of being a composer, as well as through the recurring themes in his operas. Chapter 6.2 discusses the composer’s relationship with the piano from his student days all the way through to his last works. The last two sections of the chapter deal with the practical aspect of learning Rautavaara’s work. Chapter 6.3 considers the general pedagogical benefits of practicing keyboard symmetry. Finally, Chapter 6.4 concludes with technical suggestions to pianists when studying Rautavaara’s music as well as the interpretation of symmetry as expressive tools in performance.

6.1 Symbolism in Symmetry: Extra-musical Connections

One of the biggest traits in Rautavaara’s music is the intertextual connection between different compositions. While the composer’s works may quickly jump from one style to the next within a short span of time, they are all tied together via various common traits and recurring compositional techniques that makes them unmistakably Rautavaara’s own. Sivuoja-Gunaratnam and Scott even went as far as concluding that the best way to categorize the composer’s oeuvre is not through the traditional chronological perspective, but to observe all of his existing works simultaneously as a macrotext using a list of recurring compositional tools and habits including (but not limited to) self-quotations, reworking older works, programmatic titles, and, of course, symmetrical elements.¹

¹ Scott, pp. 38 – 80.
The extra-musical aspects in Rautavaara’s music are of special interest for Wojciech Stępień, the author of Sound of Finnish Angels (2011), an extensive study focusing on angelic references in Rautavaara’s compositions with titles like Angels and Visitations, Angel of Dusk, Angel of Light, and Playground for Angels. In it he also discussed the symbolic connotations on the intertextual aspect in Rautavaara’s works, as well as the composer’s own metaphysical philosophy on viewing himself not as a creator, but as a midwife that helps bring his music into existence. In Bruhn’s interpretation of keyboard symmetry in the frequently used F# major scale and chords in Messiaen’s music (see Chapter 2.3.4), there is a vertical relationship between the two halves of a symmetrical chord, of which the bottom half from the axis (representing mankind) is created from the top half (God’s image). This vertical reflection aligns with Rautavaara’s role as a composer, being situated in between the two planes of existence. The mystical belief of being a medium between the real world and a higher power sets the undertone of Rautavaara’s aesthetics. Stępień described this duality as the “aesthetic of the double”:

If music reflects another reality, and if a composer acts as a link between the two worlds as a messenger or midwife who helps music to come into existence, then he can be called an angel. Living in two realities he seems to be schizophrenic, having a dual personality, striving to be a kind of divine performer that aims to decipher an invisible musical text as perfectly as possible.2

There is also a more “horizontal” interpretation of this dual presence, and this aspect includes Rautavaara’s tendency of revisiting his past and the fascination with his own childhood dreams. It is well known that Rautavaara frequently reworked his older compositions. The early piano work Icons, for example, was orchestrated, expanded, rewritten, and reordered under a new yet unconcealed title, Before the Icons. In an interview recorded between 1999 and 2000 (when the composer was seventy-one), Rautavaara expressed his wish to take control and “chang[e] [his] past as it ought to have been.”3 Other than changing the past, Rautavaara also yearns to understand more and, perhaps, to relive some of his youthful experiences. His very own interest in the topic of angels comes from revisiting a recurring nightmare he had as a child, where a terrifying figure visits him and tries to embrace him. When the composer later discovered Rainer

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2 Stępień, p. 81.
3 Rautavaara (2016).
Maria Rilke’s quote, “ein jeder Engel ist schrecklich” (every angel is frightening) from Die Erster Elegie, he felt resonance to this sentiment, which gave him the spark and inspiration on his various angel-titled compositions.

Rautavaara’s operas also shed some light on the symbolic meaning behind the composer’s love for symmetry. Vincent (1987), for example, is not simply a chronological retelling of the life of Van Gogh. It starts from the end when the painter was already in the asylum and goes backwards to the beginning before coming back to the present reality again.\(^4\) In fact, Rautavaara’s 1989 autobiography begins with a line from Vincent, which Matambo views as the composer using the protagonist to reflect the narcissism within himself over self-quotations in his music:\(^5\)

> Speak to that! And yell at the mirror! You’re only interested in your own image, that’s all!\(^6\)

The sense of remembering or reliving the past is also found in The House of the Sun (1990), where the protagonists are the aging twin sisters Noora and Riina, who tried to maintain the lifestyle of their childhood in Tsarist Russia when they actually live in late 1980s Finland. Both of these operas contain the theme of parallelism and confusion between reality and dream-like states, as well as the sense of trying to escape the harsh reality in the present with flashbacks or hallucinations about the past.\(^7\)

The parallelism is also exhibited in the form of dual personality and schizophrenia of the main characters, such as Vincent van Gogh as well as the Finnish author Aleksis Kivi from the opera titled after his name (1996). Along with En dramatisk scen (A dramatic scene), an unpublished autobiographical opera portraying himself as a composer, Stępień pointed out a connection between the three protagonists in this operatic “triology” as a portrait of the composer’s artistic

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\(^4\) Sivuoja, p. 6.

\(^5\) Matambo, p. 122.


\(^7\) Sivuoja-Gunaratnam (1993), p. 42.
abilities, namely as composer, painter, and writer. These autobiographical tendencies also explain the recurring themes and imageries throughout different operas such as allusions to birds, angels, Jesus Christ, and Mother Mary, as they share counterparts in reality with Rautavaara’s titles in his own compositions.

Rautavaara had personally given many interviews throughout his life in both the Finnish and English language. He has stressed repeatedly on different occasions that he believes that the creative process of music must be organic, and that he always taught his composition students to allow music to speak on its own without forcing it. This attitude is only possible with the composer’s firm belief of a higher power, of which the composer had been rather ambiguous about, unlike the clear evangelist attitude from Messiaen on his Catholic faith. The parallelism between Rautavaara’s life and philosophy and the music and drama he created offers glimpses of the inner world of the composer. Symmetry is but one of the manifestations that are generated from this attribute, and warrants further studies in the future in this regard.

### 6.2 Rautavaara and the Piano

Rautavaara had an uneasy relationship with the piano until the premiere of his *Piano Concerto No. 1* in 1970, where the composer himself played as the soloist. His piano lessons during his teenage years had to be stopped due to the Second World War, and were not able to continue until much later. The composer described the impulse of writing the first piano concerto was to make up for this absence in his training:

> The First Concerto was a compensation for a trauma. When I came to the Sibelius Academy I was still at the basics of playing the piano. I compensated for these 10 years later by playing the First Concerto with great pleasure. Since then, I have not been interested in playing the piano in public.²

It is unknown whether this complex also affected Rautavaara’s earlier piano works, but they were under another problem that the composer faced. As mentioned in the biography section in

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² Stępień, pp. 81 – 82.

²² Taken from a personal email from the composer to Marjaana Virtanen on December 14, 2004. (Virtanen, pp. 75-76).
Chapter 1.1, Rautavaara struggled to find a reliable technique to develop his materials, which eventually turned into a crisis that led him to pursue serialism. It is therefore understandable that the composer’s entire output for the piano before the serial period had been short miniatures grouped in several collections. Each of the sets during this time is more focused on specific elements or techniques compared to his later works:

3. *Icons* (1955): Orthodox mysticism  
4. *Seven Preludes* (1956): experiment on chromaticism and atonality  

The division of elements between the different sets of works above is by no means absolute. As already discussed in Chapter 3.5, symmetrical writing can also be found in *Icons* and *Seven Preludes*. In addition, examples of expanded and obscured tonality are already present as early as *The Fiddlers*. Both the *Seven Preludes* and *Partita* were written during the threshold of the composer’s first significant stylistic change, with both pieces acting as a bridge: *Seven Preludes* looks forward to the upcoming serialism and *Partita* looks back at neo-classicism. It is not known why there is a lack of solo works during the composer’s serial period. This is also surprising for Sivuoja-Gunaratnam, who pointed out that the piano is particularly popular for other composers when they are experimenting with serial writing.

As the *Etudes* and the two piano sonatas were completed within one year around the first piano concerto, and the fact that these pieces share many similar traits of romantic virtuosic writings, it is therefore reasonable to assume that all these works were part of the same effort to compensate for the composer’s insecurities as a pianist. In an overview of the *Fire Sermon* sonata, pianist Juhani Lagerspetz wrote the following:

The second piano sonata is unusually “pianistic”: it falls right under the fingers, even more so than many a work by a pianist-composer. In fact it is rare these days to find new piano music that really brings out the orchestral

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10 Matambo, pp. 32, 49-50, 69.  
11 Ibid., pp. 35-39, 41-43.  
qualities of the piano, its vast range of dynamics and of tone. One reason for this [...] lie[s] in the very style of composition: the Romantics [...] Nowadays composers do not, quite understandably, go for this style much.¹³

Lagerspetz very aptly compared Rautavaara’s most popular neo-romantic work with the music of Franz Liszt. Marjaana Virtanen, who also shared the same sentiment, compared the opening of the composer’s first piano concerto with Liszt’s Piano Concerto No. 1, where in both works, the soloist starts in a grand gesture with a cadenza.¹⁴ Rautavaara’s three piano concertos are his only large-scale works that involve the piano as a solo instrument. The two piano sonatas last around ten minutes each, and the entire collection of Etudes in seven movements is around thirteen minutes.¹⁵ The shortness of these neo-romantic piano works may be attributed to the recent abandonment of the serial technique, where Rautavaara was once again without a reliable tool to support a larger structure, although this time around, it would not pose as a problem for long, as the romantic writing enabled the large structure of the first concerto. The virtuosic writings in the neo-romantic works may have also served the purpose for the composer to help train his keyboard techniques leading up to the premiere of Piano Concerto No. 1.

While symmetrical writing is consistent throughout all stylistic periods of Rautavaara’s life, its presence in the earlier works is not nearly as prevalent as in the neo-romantic period and especially in the later synthetic period, where every single piano piece contains multiple levels of symmetry in different settings. This suggests that after abandoning serialism, the composer relied on derived materials that come from symmetrical relationships. While Rautavaara already dabbled with incorporating symmetry in textures outside of simultaneous mirroring in some of the early works (see Chapter 3.5), it is in the neo-romantic works that he established the more mature integration of symmetry in traditional textures such as polyphony, melody and accompaniment, perpetuum mobile, and chorale-like passages. As observed through the examples in the late works, many symmetrical textures from the neo-romantic works are retained. Immediate keyboard symmetry can be awkward to play, since in homorhythmic writing, both hands need to be moving and jumping simultaneously. Rautavaara generally opts

¹³ Lagerspetz, p. 15.
¹⁴ Virtanen, p. 77, n. 84.
¹⁵ Timings of the two sonatas and Etudes are based on Laura Mikkola’s recording in 1999.
for a more natural technique to the instrument, and thus relied on chordal and rhythmic interpretations of symmetry by incorporating them in textures that are already familiar with pianists. Keyboard symmetry is arranged so that it best fits the shape of the hand, where long fingers are reserved for black keys and short fingers for white keys (details in Chapter 6.4). The composer’s love for symmetry and his desire to be recognized as a virtuoso pianist who continues the pianistic tradition from the nineteenth century led to this synthesis. The familiar writing style makes his neo-romantic works immediately more appealing to the audience and more approachable for performers, thus making *Fire Sermon* sonata and the first concerto his most successful and frequently performed piano works.

When Rautavaara finally moved pass his insecurities as a concert pianist, his desire to write for the piano dwindled, as it would be another six years before he composed anything for the piano again. The *Music for Upright Piano No. 1* and *No. 2* are modernist works in the similar experimental spirit of the early *Three Symmetrical Preludes*, only this time the main subjects are extended keyboard techniques that are only feasible on the upright piano. A year later in 1977, he expanded on this idea and wrote another work: *Music for Upright Piano and Amplified Cello*. These three works are the composer’s only existing modernist compositions involving the piano as a main instrument.

Rautavaara seemed to have left the piano for good after the experimental works in 1977, as there was yet again another lengthy period where nothing was written for the instrument, despite the years since 1977 were among the composer’s most productive times. Apart from the second and the third piano concertos, written in 1989 and 2008 respectively, no solo works for piano would emerge until *Narcissus* in 2001. By this time the composer was already comfortable with stylistic synthesis and had brought back some elements of serial technique in his compositions. As mentioned in *Chapter 1.2*, Sivuoja-Gunaratnam and Scott classified this reemergence of serialism officially as the second serial period. However, this time around, the composer no longer treated serial writing as a dogma, but merely a tool among many others to be combined freely with seemingly unrelated pitch resources including the diatonic scale, modes 2 and 6, and tertian harmonies. In an interview with Virtanen, pianist Laura Mikkola described the second concerto as “madly difficult” due to ensemble work as well as technical challenges. Virtanen observed that the complex rhythm and texture posed a great demand on both the soloist and the orchestra. The soloist does not have “interpretation liberties” in pulse and tempo, as precise
rhythm and tempo is needed for the ensemble to work. Nineteen years later, when Vladimir Ashkenazy approached Rautavaara for the commission of the third piano concerto, the composer was asked to write the piece in a way where the soloist can play and conduct from the keyboard. When Ashkenazy asked whether this request caused any unnecessary burdens, Rautavaara said:

> I like difficulties, and in fact [...] only difficult solutions are worthwhile in art [...] I understood from the very beginning that the concerto ought to be possible to play and conduct simultaneously, and of course this presents certain special requirements. Especially very frequent changes of time would be awkward or impossible to beat for the orchestra while playing the solo, so I had to think about that, but it only made it, the work, very interesting.

The second and third piano concerto demonstrate Rautavaara’s transformation from thinking and composing like a virtuoso pianist in the romantic tradition to utilizing the piano as a part of the “organism” of his music, of which he stated in numerous interviews and articles that music has a life of its own, its own will, and grows organically from chosen materials. They are no longer experiments of certain styles or techniques, but are matured works of stylistic synthesis with more subtle nuances and changes.

As Rautavaara’s popularity as a composer grew internationally, he received more and more commissions from music festivals and performers alike. Rautavaara’s late works for the piano, along with some of his large ensemble works and operas were the results of these requests. Both Narcissus and Mirroring were written for international piano competitions as required commission pieces.

Despite the fact that the piano occupies only a small portion of Rautavaara’s works, it was never far away, as the composer kept coming back to the instrument after several periods of lengthy departure from it. The instrument served a critical role during the periods when the composer was trying to find his voice and searching for a reliable compositional technique.

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17 Virtanen, pp. 97 – 100.
18 Rautavaara (2000).
19 Rautavaara repeatedly stated this in numerous interviews, including one with Bruce Duffie in 1996, with Andrew Ford around 1999, and with Ashkenazy, which was included in the album under Ondine with Piano Concerto No. 3 and Autumn Garden in 2000.
6.3 Keyboard Symmetry in Practice

Based on the various analyses of Rautavaara’s solo piano works in the previous chapters, it is clear that keyboard symmetry occurs throughout the composer’s works in various forms. Prospective performers of Rautavaara’s piano music therefore need to be comfortable with symmetrical movements between the hands. As classically trained pianists tend to focus more on parallel movements from extensive practice of scales, and to be more accustomed to tonal writings and independent hand movements from traditional repertoire, adjusting to contrary movements between the hands in strict keyboard symmetry can feel unfamiliar and somewhat awkward. It is immensely helpful to learn symmetrical patterns and chords from the geography of the keyboard itself, as memorizing the combinations of black and white keys would be more helpful than written notations, since enharmonic respellings of pitches can become rather arbitrary when they no longer serve diatonic harmonies.\(^2\)

It is also common problem for pianists to neglect the left hand, which is precisely the reason for Rudolph Ganz to create his set of exercises (see Chapter 2.2) that uses simultaneous symmetry to even out the technical facilities for each hand. These exercises include various symmetrical inversion studies that provide a great start for those who are unfamiliar with keyboard symmetry, as the exercises themselves are based on familiar tonal techniques found in other technical studies including single and double-note scales, broken chords, and arpeggios. Based on Ganz’s suggestion of simultaneous hand developments, any virtuosic passages from standard piano repertoire can be practiced in mirror symmetry, where difficult passages for the right hand can be inverted to benefit the left hand, and vice versa. He gave a number of examples that included

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\(^2\) Italian pianist-composer Ferruccio Busoni (1866-1924) criticized the traditional Western music notations as archaic and lifeless. He attempted to derive a solution of an organic method of keyboard notation in 1909 by the means of proposing a new type of musical staff along with changing the visual appearance of note heads. One aspect that is particularly interesting (and applicable to keyboard symmetry) is the visual representation of the black/white key layout of the keyboard in the new staff, where five lines of the traditional staff are split into a 2 + 3 group by the means of adding extra space between the second and middle line. The line notes now represent black keys and space notes for white keys (the extra space now shows the position of E and F). This new visual is further aided by new definitions of black and white note heads, now representing black and white keys instead of duration of the note. Busoni’s experiment was published along with a complete re-notated score of Bach’s Chromatic Fantasy and Fugue in D minor. However, many have criticized and rejected Busoni’s proposal, mainly due to the fact that it is overly complicated, as multiple staves are needed to display notes in different octaves. It is also too keyboard-centric for other instrumentalists, and thus not a practical alternative for the established notation system. (Knyt, pp. 44, 46.)
several of Chopin’s *Etudes*, excerpts from Beethoven’s “Appassionata” Sonata, and even Scriabin’s *Nocturne for Left Hand*, now inverted for right hand alone. The parallel bitonal scales towards the end of the book are particularly useful to train the ear for bitonal harmonies that can result from mirror writing. In fact, this is precisely what Ganz had in mind when he wrote these exercises. In reference to the countless technical studies already written for the piano from well-known pedagogues including Czerny, Cramer, Liszt, Leschetizky, and many others, Ganz wrote the following:

> These writers treated of almost every conceivable problem in the music of their time. Why am I presuming to add more to this great volume of technical literature? Because with new sound in twentieth-century music new problems have arisen. It is to train students’ ears as well as their hands for these new sounds that I have devised this book of exercises […] I have devoted considerable space to symmetrical inversion […] I have found this to be the most effective means for truly equal development of the hands.\(^2\)

Persichetti’s *Reflective Keyboard Studies* (1981) begins with the same approach as Ganz using the traditional technical demands, but he greatly expanded the possibilities of symmetry exercises by creating his own unique challenges by either mixing different modes into synthetic scales and arpeggios, awkward leaps and chordal jumps, and sudden directional or articulation changes. There are a total of 48 exercises divided evenly into three sets, with each set in increasing difficulty. Ultimately, Persichetti designed the set of exercises to prepare for his *Mirror Sonata*, with some of the studies as excerpts from the piece itself. Persichetti’s more specific studies are useful for general developments of one’s technical facilities, but they are not a necessary step to get into Rautavaara’s solo piano works, as he rarely writes in strict keyboard symmetry between the hands after the *Three Symmetrical Preludes*, or reaches the same level of near-atonal chromaticism as Persichetti’s works. Symmetrical writing in Rautavaara’s piano compositions is largely limited to the level of texture and harmonic structure. As mentioned earlier in the chapter, the neo-romantic style continued in Rautavaara’s piano works even through the late solo works. Grandiose romantic writings including rapid oscillating arpeggio textures, long melodic lines, fast unmeasured cadenza passages, and toccata-like motoric passages should be quite familiar to pianists well versed in Romantic and early twentieth-century

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\(^{21}\) Ganz, p. 1.
repertoire. There are a few recurring traits of pianism in Rautavaara’s works that deserve further study and will be explored in the next section.

6.4 Technical and Interpretive Suggestions of Rautavaara’s Piano Works

The synthesis of symmetry with traditional textures yields a unique blend of modal harmonies that sets Rautavaara’s music apart from that of other composers. Since self-allusion is a common theme across different stylistic periods in his music, the composer is prone to reuse similar textual materials across different pieces. Adopting certain strategies will help to accelerate the learning process for pianists. The technical suggestions that will be discussed below include the way Rautavaara uses chords both as ostinato figures and thickened melody line, symmetrical modal scales, and $3 + 2 + 3$ rhythm. Symmetry-related interpretative suggestions will also be provided towards the end of the chapter.

Scott has briefly discussed some of the technical challenges in Rautavaara’s music towards the end of her dissertation. She described his piano works as moderately difficult, but “artistically pleasing to the broader audience because of their accessibility.” The potential problems for performers that she identified including big chords that require a large hand span, as well as passages that demand very high velocity to play at required tempo.\(^{22}\) As mentioned in the second part of the current chapter, Rautavaara’s relatively limited skill at the piano also means that his piano music does not have the same level of virtuosic requirements compared to other contemporary composers. However, Rautavaara’s knowledge of the instrument, particularly the synthesis of keyboard symmetry and traditional texture, makes his piano works fit very comfortably under the hand.

It has been established in earlier chapters that one of the central elements in Rautavaara’s music are chords. Most of the ostinato passages across different works are in rapid oscillating arpeggios that can be reduced to chords or scalar motives in three or four notes. Grouping notes in either alternating hands or repeating finger groups within a single hand generally works well with these

\(^{22}\) Scott, p. 146.
passages. For example, the ostinato portion of bar 62–64 from *Piano Sonata No. 1 “Christus und die Fischer”* (Example 4.11c) can be reduced to three-note chords, and executed in alternating hands every three notes. The same method is also applicable for the major 7th and bitonal harmonies in *Terrsit* (Example 4.1b and 4.2) where the composer clearly grouped the figures in four notes with alternating stem directions for each hand. The opening of *Piano Concerto No. 2* contains rapid scalar runs involving both hands sharing a tetrachord from the symmetrical synthetic scale: C–E–F♯–G–A–B♭–C–E. Though a lot freer than the examples from the first Sonata and *Terrsit*, the same method of hand grouping is still applicable in this case. In some cases, there are stretched out melodies on top of these ostinato figures that will require the familiar three-handed technique that is common in nineteenth-century repertoire, where the top line needs to be clearly maintained through voice balancing and matching the tones for each melodic note. There are abundant examples of this three-hand texture. Some of the ones already discussed in this paper include *Terrsit* (Example 4.2), the first movement of “Christus” (Example 4.16), and *Narcissus* (Example 5.7).

Large solid chords and clusters are often used as textual “thickener” of a single-note melody. This is demonstrated in the opening of *Piano Concerto No. 1*, where the right hand melody is exclusively in white key clusters. In Example 3.17b, we can observe an earlier example from *Icons* that uses chords to thicken the melody line, as the opening melody returns in the form of large chords in mirror symmetry. When these series of solid chords are treated as a melodic line, voicing of the top line is recommended. Well-timed pedal changes on every chord need to be applied as well, as the top melody can be easily drowned out by the lower notes and clashing harmonies. There are also times when clusters are used purely as sound effects, such as the last two bars of the first movement and opening of the second movement of “Christus” (Example 4.17 and 4.18) and the middle section of the second movement in “Fire Sermon”. These clusters are often quite large and their notations vary. The ending of the first sonata uses real notes to mark the upper and lower boundary of the clusters, while the notes in between are marked by square brackets, indicating every note in between the boundary notes should be played. Rautavaara also indicates white key and black key clusters using the words “weiss” (white) and “schwartz” (black). However, the notation changes to rectangular note heads in *Fire Sermon* and the use of natural and sharp signs to indicate white and black key clusters. These discrepancies of notation do not change the way these clusters should be read. The boundaries of these clusters
often serve important harmonic functions in the music and should be followed as precisely as possible.

Lengthy cadenza-like passages in Narcissus (Example 5.8) and passages in the first movement of the “Fire Sermon” sonata contain scales in mode 2 and 6 that need to be executed in very high speed. As mentioned in Chapter 2.5, these two modes can be transposed to fit the symmetry between black and white keys. The combination between keyboard symmetry and modal symmetry is precisely what Rautavaara used in these two examples, and the choice of fingering should consider the ergonomic shape of the hand to the keyboard. Naturally, fingers 2, 3, and 4 are better suited for the black key groups while the shorter thumb and finger 5 should be reserved for white keys. Due to the high speed in these scale passages, it is generally advised to use a quick switch between hand positions with the thumb passing over the hand rather than under.

The ever-present 3 + 2 + 3 symmetrical rhythm is often used in a motoric setting, where the toccata-like rhythmic drive should be precise and consistent. In order for the character of the uneven groups to stand out, it is advisable that the motoric sections to not be played too fast and pedal changes need to be clean and frequent to avoid blurring of the rhythmic groups. Slightly pulsing the first notes of every rhythmic group in a slow and steady tempo is an effective way of internalizing the uneven groups for performers.

The different varieties of symmetry-based textures mentioned above enable the composer to propel the music forward without succumbing to Bernstein’s demonstration of the “perfect nightmare of symmetry” (see Chapter 2.2). Rautavaara can propel the music forward with the energy created by the fast ostinato of scales or broken chords. Often he starts a pattern in perfect symmetry and moves away from it with passing chords or transpositions, giving the linear direction typically of common-practice Western art music. Example 5.16 from Narcissus demonstrates this exact forward motion in the right-hand chords. The melodic arch of rising and falling lines can also be adapted to incorporate symmetry. Example 4.4 from Tritonutset shows the hands moving away from each other, but is to be interpreted as a rising line due to the crescendo symbol.
Example 6.1: Rautavaara: Sonata No. 2 “Fire Sermon”, first movement, bar 97 – 102

The example from “Fire Sermon” above shows the familiar ostinato pattern below a chordal melody. Both hands in the downbeat of bar 97 play the same pair of symmetrical dyads around a G# axis. The left hand can be seen moving away from keyboard symmetry while keeping the four-note chord pattern. While not in keyboard symmetry anymore, the subsequent harmonies – F# and E diminished triads – still contain interval symmetry. The right hand follows a completely different path from the same chord in bar 97 by forming the entire chordal melody based on mirroring dyads. The melodic line is in an arch, with the high point being the highest note on the downbeat of bar 100.

When Virtanen interviewed Mikkola on Rautavaara’s attitude to different interpretations of his works by performers, the pianist mentioned that she took some liberties from the score in her performance of the first concerto:

[Rautavaara] is sometimes surprised about something I do… but then he has thought about it and comes to feel that, as a matter of fact, do it just like that,
it works well […] he says generally about metronome markings that they are, in a way, circa, […] that you don’t really need to take them literally.\textsuperscript{23}

For the vast majority of Rautavaara’s piano works, including the three piano concertos, the composer left relatively few performance related markings on the score. Most of Rautavaara’s piano scores use conventional notations with only a handful of unusual spots, which are all related to clusters that the composer would specify on either white or black keys, and whether they should be played by the palm or the entire forearm. In fact, the only time extended techniques on the piano are experimented with was during 1976 in the two \textit{Music for Upright Piano} and \textit{Music for Upright Piano and Amplified Cello}. The open-mindedness that Rautavaara displayed to Mikkola’s interpretations is along the same vein as the composer’s own philosophy of his role as a composer as well as his teaching style at Sibelius Academy, where he repeatedly steered his students away from mainstream conformities and dogmas and encouraged them to listen to their own voices.\textsuperscript{24}

The true romantic spirit in the larger portion of Rautavaara’s works makes his music very accessible to performers and listeners alike. Through the discussions presented in this dissertation, we can observe the consistent element of symmetry that goes through the different stylistic changes and helps to constitute the distinctive sound of Rautavaara’s music. It is the intention of the author to enrich the discussion of Rautavaara’s music through the perspective of symmetry, and reflect especially on its role in musical structure.

\textsuperscript{23} Virtanen, p. 141.

\textsuperscript{24} Salonen (2013).
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Appendix
List of Piano Works and Piano Concertos by Einojuhani Rautavaara

**Neo-Classical Period (Up to 1957)**

Three Symmetrical Preludes (1949-50)

*Pelimannit* (The Fiddlers) (1952)

*Ikonit* (The Icons) (1955)

Seven Preludes (1956)

Partita (1956-58)

**Serial Period (1957 – 1965)**

*No piano works written*

**Neo-Romantic & Experimental Period (1967 – ca. 1980)**

*Etydit* (Études) (1969)

Piano Concerto No. 1 (1969)

Sonata No. 1: *Christus und die Fischer* (1969)

Sonata No. 2: *Fire Sermon* (1970)

Music for Upright Piano No. 1 & 2 (1976)

**Synthesis Period (ca. 1980 – 2016)**

Piano Concerto No. 2 (1989)


*Narcissus* (2001)


*Fuoco* (2007)

*Mirroring* (2014)
Copyright Acknowledgements

The author would like to personally thank Fennica Gehrman Oy, Boosey & Hawkes, Universal Edition AG, Edition Peters, and Breitkopf & Härtel for their permission in using parts of their copyrighted materials in this thesis. Below is a list of pieces appeared in this paper grouped under each publisher:

**Fennica Gehrman Oy:**

Einojuhani Rautavaara (1928 – 2016)

*Three Symmetrical Preludes*
*Icons*
*Sever Preludes for Piano, Op. 7*
*Etudyt*
*Piano Sonata No. 1 “Christus und die Fischer”*
*Piano Sonata No. 2 “Fire Sermon”*
*Narcissus*

**Boosey & Hawkes:**

Einojuhani Rautavaara (1928 – 2016)

*Fuoco*
*Mirroring*

Béla Bartók (1881 – 1945)

*Mikrokosmos, Book 6, No. 141, 149*
*Sonata for Two Pianos and Percussion*

**Universal Edition AG:**

Anton Webern (1883 – 1945)

*Variations for Piano, Op. 27*

**Edition Peters:**

J. S. Bach (1685 – 1750)

*The Well-Tempered Clavier, Book 1, No. 21 in B-flat major*
Joseph Haydn (1732 – 1809)

*Piano Sonata No. 33 in A major, Hob. XVI: 26*

**Breitkopf & Härtel:**

J. S. Bach (1685 – 1750)

*A Musical Offering*

Johannes Brahms (1833 – 1897)

*Sonata No. 1 in G major for Violin and Piano*