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GYÖRGY LIGETI'S PIANO ÉTUDES:

A POLYRHYTHMIC STUDY

By

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ABSTRACT

This treatise “György Ligeti’s Piano Études: A Polyrhythmic Study” focuses on polyrhythm in his Piano Études. The purpose of this study is to present the complex polyrhythmic sections that are influenced by African Music, Conlon Nancarrow’s player piano music, fractal theory, hemiola, and gamelan music.

For this project, the rhythmic sections of the Piano Études are reviewed from two different perspectives: the influence of Nancarrow’s player piano music which usually conveys polytemporal relationship, and African music which often provides a repeated rhythmic pattern like ostinato.

In addition, this document presents technical problems and solutions for Ligeti’s Piano Études, including score reading, fast tempo, perpetual pattern with accentuation, dynamics, and polyrhythmic sections.

CHAPTER 1
INTRODUCTION

Background and Purpose of the Project

One of the most significant composers of the last half of the twentieth century is the Hungarian György Sándor Ligeti (1923-2006). Ligeti is known for his experiments with new sounds, which continued throughout his life. His works are shaped by various influences not only from musical innovation but also from his huge interest in science. Ligeti always tried to find a new compositional style instead of remaining with the current trends of music.

In Ligeti's early period, before he left Hungary, he was impressed by the music of Béla Bartók (1881-1945). Until the death of Stalin in 1953, any new kind of music, for example the Second Viennese School, was prohibited by the government in Hungary.[1] However, as Bartók was a great national composer, some of his music was not banned. Therefore, Ligeti could be exposed to some of these works even though Bartók had already fled Hungary. Around 1955, Ligeti became familiar with new music by Schönberg and Berg, and came to know all of Bartok's later pieces which had been restricted by the political regime.

Through these pieces, such as Bartók's Piano Concerto No. 3 (1945) and Concerto for Orchestra (1943), Ligeti was introduced to a new compositional style. For example, Bartók's use of tonal ambiguity, irregular meter, offbeat accents, free contrapuntal techniques, folk melody, and polytonality became the foundation of Ligeti's experiments to find new sounds. Traces of Bartók's influence can even be found in Ligeti's later works. Ligeti's String Quartet No. 2 (1968) and Bartók's string quartets present similarities such as five-movement structure and abrupt staccato patterns with accents. Moreover, Ligeti's Piano Étude No. 4 (1985) utilizes Aksak rhythm (see Chapter 3), which was often used by Bartók.

After he fled Hungary, Ligeti experienced various styles of new music: serialism, aleatoric music, fluxus, and electronic music. Above all, he developed a new compositional technique that he called "micropolyphony," the slow-moving sound of which is created when many lines move at different rates of speed to produce a canon of massive sound. The artificial

[1] Paul Griffiths, *György Ligeti: Contemporary Composer*, 2nd ed. (London: Robinson Books, 1997), 12.

language he created in his mini operatic works showed his sense of humor. As one of the leaders of the European avant-garde along with Stockhausen and Boulez during the late 1950s and 1960s, Ligeti had been more skeptical in outlook than others. In his *Requiem,* he expressed death as a survivor of the Holocaust. In the late 1960s, Ligeti brought out the melody in his works which was not in the micropolyphonic music. He gradually elaborated a new harmonic-melodic language that was, as he liked to say, neither tonal nor atonal.[2]

After Ligeti's ambitious opera *Le Grand Macabre*, he had difficulty finding a new creative direction. However, the Piano Études Book 1 (1985) demonstrated a new compositional style including rhythmic experimentation, which was one of the tools he used to reach his new musical style in the 1980s. The Piano Études were mainly inspired by polyrhythmic Central African music, Conlon Nancarrow's player piano works, and fractal theory. The polyrhythms and extremely fast tempi in these études present extensive technical difficulties for a performer. Meanwhile, he applied his new compositional style on a broader scale to concertos for the piano, violin, and horn.

Later, in the 1990s and 2000s, Ligeti composed in a new style of music unlike the previous period. It was not too far from the compositions he had created as a young man in Hungary. He returned to using Central European folk tunes in his last song cycle *Sippal, Dobbal, Nádihegedüval*. In addition, Ligeti's Piano Études Book 3 is gentler and less dramatic than Books 1 and 2. All four Études from Book 3 concentrate on white keys and a gently inflected modality, which were a part of the composer's plan to move away from the style of the previous Piano Études.

As a man who grew up during an upheaval in society (World War II and the Soviet tyranny), Ligeti encountered diverse cultures throughout his life. Like his life, Ligeti's musical style never completely settled into any of the common musical trends as he sought new musical styles until the last stage of his life.

[2] Paul Griffiths, "György Ligeti, Central-European Composer of Bleakness and Humor, Dies at 83," *New York Times*, June 13, 2006, Arts section, Late edition.

Method and Approach

This project focuses on György Ligeti's polyrhythmic Piano Études, which are representative works of the 1980s and 1990s. Chapters 2 and 3 provide knowledge of his life and compositional influences as a background to understanding Chapters 4 and 5 which are regarded as the main body of this project.

Chapter 2 presents a short biography of Ligeti, focusing on his major works and the important events of his life, which are mentioned chronologically. Knowing about his tragic early life during World War II helps in understanding his music. By representing Ligeti's major works in this Chapter, his kaleidoscopic compositional methods will be introduced.

In Chapter 3, various influences on his compositional style in the 1980s and 1990s are addressed. As a composer interested in various fields, his music of this time was influenced by various styles of music and even by science. Central African music, Nancarrow's music, and fractal theory all became major triggers for Ligeti's experiments in polyrhythm. Also the traces of hemiola, Ockeghem, Bartók, and gamelan music in his Études are mentioned. Investigation of these influences is crucial in understanding Ligeti's polyrhythms in the Piano Études.

Chapter 4 offers analyses of polyrhythm in Ligeti's Piano Études, which will help a pianist understand the complicated polyrhythms. Through these short excerpts, a reader can observe how Ligeti applied various aspects mentioned in Chapter 3 to his Piano Études.

The last Chapter addresses performance issues, including technical problems and suggested solutions for complicated sections in the Piano Études, reflecting the author's personal experiences and opinions.

Literature Review

György Ligeti left a large number of primary sources, which have served as important reference materials for the study of his life and works. Ligeti's first biographer, Ove Nordwell, retrieved several manuscripts of Ligeti's works in order to study his music.[3] In the late 1980s these manuscripts were transferred to the Paul Sacher Foundation in Basel, Switzerland. At the

[3] Richard Steinitz, *György Ligeti: Music of the Imagination* (Boston: Northwestern University Press, 2003), 74.

end of 2000, large quantities of Ligeti's manuscripts, preliminary working notes, documents and memorabilia were relocated to Basel. Therefore most of his primary sources are carefully preserved.

Ligeti's works were published by three different companies. In the 1960s, Ligeti published *Apparitions* and *Atmosphères* with Universal Edition.[4] However, their incompetence (they lost Ligeti's manuscript of *Atmospheres*) and limited interest in Ligeti's work caused him to change to C. F. Peters Musikverlag.[5] Thereafter, Ligeti's *Volumina, Aventures, Nouvelles Aventures, Requiem, Lux aeterna* and *Cello Concerto* were published by Peters. From 1967, his publisher was Schott Music Company, one of the premiere publishers of twentieth-century music.[6]

The most important primary source is his personal writing. After Ligeti left Hungary, he published about thirty-two articles and interviews to explain his musical ideas and techniques. Among these documents, twenty articles were completed after the 1980s, most of them written in German and French. Relating to this project, Ligeti's article "On My Étude for Piano" (1988) provides fundamental ideas about his Piano Études. Ligeti states that the main idea of the Piano Études is a new concept of rhythmic articulation, called polyrhythm.[7] In reference to polyrhythm, Ligeti clearly details his influences, including the hemiola from Baroque practice, polyrhythmic African music, Conlon Nancarrow's player piano studies, and fractal theory.[8]

Another article by Ligeti, entitled "On My Piano Concerto" (1988) explains that each movement represents his compositional methods often used in the 1980s, including polymeter, polyrhythm, and fractal theory.[9] Careful review of this article aids in understanding the Piano Études, since the concerto was composed at nearly the same time in his life.

When considering Ligeti's works before the 1980s, four personal interviews with the composer provide important insight. Originally these interviews were published separately, until

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[4] Ibid., 123.

[5] Hyi-gyeong I, *Ligeti: Music of the Transversal* (Korea:Yesol Seoul, 2004). 55-56.

[6] Ibid.

[7] György Ligeti, "On My Étude for Piano," translated by Sid McLauchlan, *Sonus* 9/1 (1988), 3.

[8] Ibid.

[9] György Ligeti, "On My Piano Concerto," translated by Robert Cogan, *Sonus* 9/1 (1988), 11.

Eulenberg Books collected and published them in 1983 under the title *György Ligeti in Conversation*.[10] An interview with Péter Várnai (1978) provides valuable information on the different stages of Ligeti's musical development until the 1970s. In addition, Ligeti discusses his teaching ideas and his opinions about previous composers and their music, including Mahler, Schubert, Wagner, Schoenberg, Berlioz and Mozart.[11]

In his interview of himself, "Fragen und Antworten von mir selbst" (1971), Ligeti explains his micropolyphonic idea that began in the 1950s.[12] An interview with Paul Griffiths, published in 1983, includes questions about Ligeti's childhood and political circumstances before he fled Hungary, providing information about his early compositional influences.[13] Throughout these interviews, the composer's own opinions are revealed clearly without editing by others. Approximately twenty-nine interviews between the 1980s and 2000s, originally written in German and French have been translated into English, however some have not yet been translated.

As for secondary sources, much information is found in the biographies of György Ligeti. After the first biography, *György Ligeti: Eine Monographie* (1971) by Swedish musicologist Ove Nordwall, numerous other biographies were published.[14] The most recent book, *György Ligeti: Music of the Imagination* (2003), was written by Richard Steinitz. This work portrays his life, works and important events chronologically.[15] Steinitz describes Ligeti's early years and family background in depth. In addition, since it is the only biography published in the 2000s, it contains some rare information about Ligeti's life and works, including his later period (2000-

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[10] György Ligeti, *Ligeti in Conversation: with Péter Várnai, Josef Häusler, Claude Samuel, and Himself* (London:Eulenburg Books, 1983).

[11] Péter Várnai,. *Bezélgetések Ligeti Györgyel* (Budapest: Zenemükiadó Vállalat, 1979) reprinted in *Ligeti in Conversation: with Péter Várnai, Josef Häusler; Claude Samuel, and Himself*, English translated by Gabor J. Schabert (London: Eulenburg Books, 1983), 13-82.

[12] György Ligeti, "Fragen und Antworten von mir selbst," *Melos* 38 (1971), 509-16 reprinted in *Ligeti in Conversation: with Péter Várnai, Josef Häusler; Claude Samuel, and Himself*, English trans. by Geoffrey Skeleton (London: Eulenburg Books, 1983), 124-137.

[13] Griffiths, *György Ligeti*, 6-15.

[14] Ove Nordwell, *György Ligeti: Eine Monographie.* translated by Hans Eppstein (Mainz: B. Schott's Sohne, 1971).

[15] See the Contents, Steinitz, *György Ligeti: Music of the Imagination.*

2006), and musical descriptions of all eighteen Piano Études.[16] This is the only book to contain a list of Ligeti's complete works.[17]

Another important biographer, Richard Toop, focuses more on Ligeti's life and influences such as political issues and musical trends. Toop's book, *György Ligeti* (1999), discusses Ligeti's musical experience in his college years, the Hungarian revolution, and the escape from Hungary.[18] These events are described in detail with several illustrations. Also Toop provides several pages to explain the composer's relationship with Bartók, Kodaly and Kurtag.[19]

Most of the earlier studies, including dissertations and articles about Ligeti, focused on his micropolyphonic works from the 1950s to the 1970s. The articles "Inaudible Structures, Audible Music: Ligeti's Problem, and His Solution" (1987) and "Voice Leading as a Spatial Function in the Music of Ligeti" (1994) by Jonathan W. Bernard investigate Ligeti's micropolyphonic techniques by using diagrammatic charts.[20] A similar study was performed by Jane Piper Clendinning in her dissertation entitled "Contrapuntal Techniques in the Music of György Ligeti" (1989).[21]

Compared to the earlier studies, recent writings have focused mostly on Ligeti's late works. About twelve dissertations[22] relating to Ligeti's Piano Études or his compositional style

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[16] Ibid., 277-364.

[17] Ibid., 387.

[18] Richard Toop, *György Ligeti* (London: Phaidon Press, 1999), 24-72.

[19] Ibid., 24-44.

[20] Jonathan W. Bernard, " Inaudible Structures, Audible Music: Ligeti's Problem, and His Solution," *Music Analysis* 6 (1987): 207-36; idem, "Voice Leading as a Spatial Function in the Music of Ligeti," *Music Analysis* 13 (1994): 227-53.

[21] Jane Piper Clendinning, "Contrapuntal Techniques in the Music of György Ligeti" (Ph.D. diss., Yale University, 1989).

[22]This list contains those that will not come up later in this chapter.
Brian Lefresne, "Applications of Chaos Theory and Fractal Geometry in the Music of György Ligeti" (M.A. thesis, University of Ottawa, 2005).
Leiling Chang, "Lorsque le temps deviant espace: Analyse du *Deuxieme Livre d'Études Pour Piano*" de György Ligeti," (Ph.D. diss., Universite de Montreal, 2004).
David Stephen Isgitt, "An Analysis of Periodic Rhythmic Structure in the Music of Steve Reich and György Ligeti" (M.M. thesis, University of North Texas, 2001).
Mayron Kacy Tsong, "*Études Pour Piano, Premier Livre* of György Ligeti: Studies in Composition and Pianism," (M.M. thesis, Rice University, 2001).

during the 1980s were completed between 1991 and 2007. One of the earliest studies on the Piano Études was Lois Svard's dissertation (1991) entitled "Illusion in Selected Keyboard Works of György Ligeti." Svard's dissertation contains analyses of four keyboard works *Continuum, Monument-Selbsportrait-bewegung, Piano Étude book 1,* and the *Piano Concerto* in which she investigates illusory patterns.[23] Among these analyses, the author focused the most attention on Piano Étude No. 1 *Désordre*. She analyses the structure and several compositional influences in Ligeti's *Désordre*.

The document "The Lamento Motif: Metamorphosis in Ligeti's Late Style" by Stephen Taylor (1994) examines the lament motif in the Horn trio, the sixth Piano Étude, and the second and third movements of the Piano Concerto.[24] Taylor shows how Ligeti applied his lament motif to various works during late period. Moreover, the last chapter discusses the impact of Bartók's influences on these works.

John Cuciurean explores several of Ligeti's late works in his dissertation "A Theory of Pitch, Rhythm, and Intertextual Allusion for the Late Music of György Ligeti" (2000).[25] Cuciurean provides the analyses of selected excerpts and discusses Ligeti's use of specific compositional techniques and how these techniques may be modeled abstractly. To explain Ligeti's techniques, the document investigates fourteenth century Ars Nova composers and aspects of rhythmic complexity. The author also mentions the harmony and voice-leading in Ligeti's middle period works. The bibliography and discography sections cover an extensive amount of research.

In general, these recent studies present Ligeti's 1980s compositional methods and influences. While they all provide analyses of selected works by Ligeti, few have analyzed his works from a performer's point of view. Two dissertations from the performer's standpoint are Yung-jen Chen's "Analysis and Performance Aspects of György Ligeti's Études Pour Piano:

Amy Marie Bauer, "Compositional Process and Parody in the Music of György Ligeti" (Ph.D. diss., Yale University, 1997).

[23] Lois Svard, "Illusion in Selected Keyboard Works of György Ligeti," (D.M.A. thesis, Peabody Institute of the Johns Hopkins University, 1991).

[24] Stephen Andrew Taylor, "The Lamento Motif: Metamorphosis in Ligeti's Late Style" (D.M.A. thesis, Cornell University, 1994).

[25] John Daniel Cuciurean, "A Theory of Pitch, Rhythm, and Intertextual Allusion for the Late Music of György Ligeti" (Ph.D. diss., State University of New York at Buffalo, 2000).

Fanfares and *Arcen-ciel*"[26] and Mark Uranker's "Ligeti's *Désordre* from *Études Pour Piano Premier Livre*: An Analysis and Performance Guide."[27] Both researches identify technical difficulties and provide practice suggestions based on the authors' personal experiences.

Mayron Kacy Tsong,[28] Stephen Andrew,[29] and Alexandra Townsend[30] studied Ligeti's Étude No. 6 *Automme à Varsovie,* which provids the most complex polyrhythms of Ligeti's Piano Études. Their documents provides theoretical analyses and show Ligeti's use of polyrhythm. In addition, Leiling Chang's dissertation focused on Ligeti's Piano Études from book II.[31]

Further research is needed for Ligeti's Piano Études *Deuxième Livre* (second book) and *Troisième Livre* (third book). Through studying the *Troisième Livre*, the composer's musical style in the last period could be traced. Moreover, a performance guide for pianists would encourage more performances of these works, especially technical suggestions which might be helpful for performers, since these Études present extremely difficult technical challenges that include polyrhythms.

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[26] Yung-jen Chen, "Analysis and Performance Aspects of György Ligeti's Études Pour Piano: *Fanfares* and *Arcen-ciel*" (D.M.A. thesis, The Ohio State University, 2007).

[27] Mark Uranker, "Ligeti's *Désordre* from *Études Pour Piano-Premier Livre*: An Analysis and Performance guide" (M.M. thesis, California State University, Long Beach, 1998).

[28] Mayron Kacy Tsong. "Analysis or Inspiration? A study of György Ligeti's *Automme a Varsovie*" (D.M.A. thesis, Rice University, 2003).

[29] Stephen Andrew Taylor, "The Lamento Motif: Metamorphosis in Ligeti's Late Style" (D.M.A. thesis, Cornell University, 1994).

[30] Alexandra Townsend, "The Problem of Form in György Ligeti's *Automne a Varsovie* from *Études Pour Piano, Premier Livre*" (D.M.A. thesis, The University of British Columbia, 1997).

[31] Leiling Chang, "Lorsque le temps deviant espace: Analyse du *Deuxieme Livre d'Études Pour Piano*" de György Ligeti," (Ph.D. diss., Universite de Montreal, 2004).

CHAPTER 2
BIOGRAPHY OF GYÖRGY LIGETI

György Ligeti was born on May 28, 1923, in Dicsöszentmárton in Transylvania, a small town retroceded to Rumania from Hungary after World War I.[32] His father Sándor Ligeti, who wanted to be a scientist, became a banker instead to make a living. Like Sándor, the young Ligeti was interested in science and math although there was some musical background in the family. His grandfather was a professional artist and his uncle was the famous violinist, Leopold Auer.[33] During his childhood, the young Ligeti was constantly surrounded by music.

When he was six, the family moved to Cluj, one of the biggest cities in Transylvania. In Cluj, Ligeti was introduced not only to a variety of musical experiences, but also to Rumanian culture and language. The traditional Rumanian funeral lament "Bocet", which Ligeti heard at this time, was often found in his music of the 1980s and 1990s.[34] Above all, listening to live radio broadcasts of operas and symphonies from Budapest, a musical epicenter of Eastern Europe, built the basic foundation for his musical life.[35]

In his childhood, Ligeti had a vigorous imagination. He liked to express his own imaginary world by naming objects in nature or habitually composing short melodies and crooning songs.[36] Ligeti made an imaginary world, Kylwiria, to express his creative talent. In this imaginary world, he created a detailed city map, a legal system, and even a perfectly logical language.[37] Throughout his life, Kylwiria was to be a perfect utopia in his mind, and it nearly made an appearance in his opera in 1974.

Despite Ligeti's apparent imagination and talent for music, his father, Sándor, resisted giving him a formal musical education until he was fourteen, at which time he began piano lessons. Although he started his musical training relatively late, he showed impressive progress

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[32] Toop, 10.

[33] Steinitz, *Music of the Imagination,* 3.

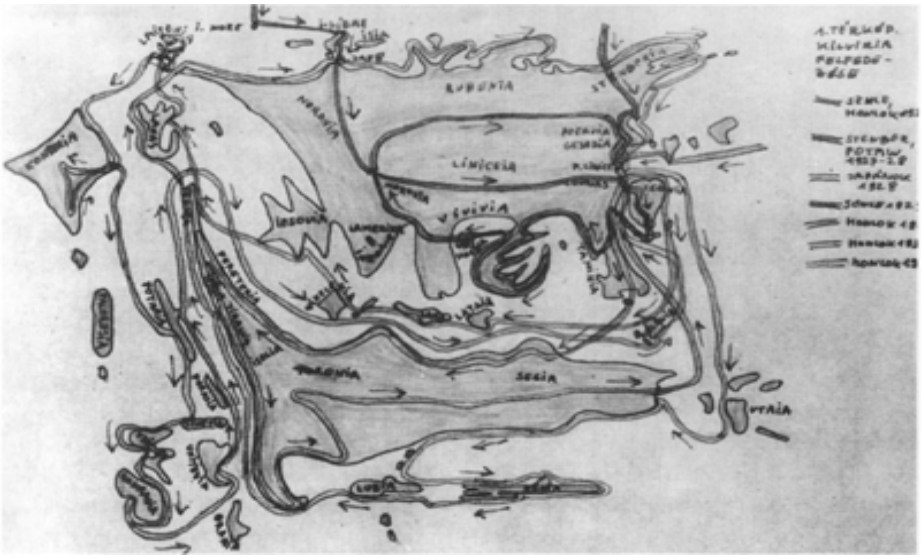
[34] Ibid., 9.

[35] Ibid.

[36] Toop, 12.

[37] Steinitz, *Music of the Imagination* , 10.

in his piano playing and soon began to compose. At sixteen he composed an orchestral piece inspired by Strauss and Wagner. By extensively studying their scores and participating as a timpanist in an amateur orchestra, he gained firsthand knowledge of the orchestral sound. In 1941, at eighteen years of age, he was awarded first prize in a music competition for his song *Galillee*, which was also his first published work.



Example 2.1. Kylwiria[38]

World War II was to have a great effect on the rest of Ligeti's life. Anti-Semitism began to spread all over Eastern Europe. In 1941, Ligeti decided to enter the University of Kolozsvár as a science student, but the government allowed only one Jewish student to enter the University each semester. As a Jew, Ligeti could not get that place even though he passed the entrance examination. After a year, Ligeti entered the Cluj Conservatory as a composition student.[39] He studied composition and theory with Ference Farkas and Pál Kádosa. An analysis class with Kádosa that covered a huge amount of classical repertory was especially influential and helped

[38] Toop, 13.

[39] Steinitz, *Music of the Imagination*, 17.

Ligeti to understand the masterpieces.[40] During this period, Ligeti was exposed to Stravinsky, Hindemith, and Bartók's later works. (Ligeti already knew Bartók's early works, but was now introduced to Bartók's later pieces: *Divertimento* and the Second Violin Concerto).

A set of two piano pieces composed in 1943, *Polyphonic Study*, shows Ligeti's basic idea of polyphony. Four folk melodies in each hand are repeated continuously without variants in order to make multiple layers, and the polyphony occurs naturally because of their different length, pitches, and tonality. Richard Steinitz commented, "it is early evidence of Ligeti's exploratory bent and propensity for devising automatic mechanism."[41]

In 1944 Ligeti was sent into forced labor and the rest of his family was sent to Auschwitz. Luckily, in October of the same year, he escaped Russian forces and walked two weeks back to his home. Unfortunately, his mother was the only survivor among his family in Auschwitz. Despite these painful circumstances, he entered the Budapest Academy to finish his studies.

As a pupil of Sándor Veress, who was a student of Bartók, Ligeti was able to learn important compositional techniques including advanced harmony, counterpoint, and orchestration. At that time, it was a rare opportunity to listen to music from outside of Hungary due to the political situation. Most Hungarian composers were able to access only a few works by Stravinsky and Bartók. Therefore, like most of his friends and colleagues, his creative activity and access to western music was restricted by the communist government. For this reason, he was limited to studying Bartók and Rumanian folk melodies. The inherent polyphony and heterophony in Eastern folk melodies was attractive to Ligeti at that time. The political situation explains why his early works are primarily folksong arrangements. Ligeti commented:

> From 1948 to 1949 everyday life changed radically: the totalitarian Stalinist dictatorship began. It was horrible…So any new kind of music was prohibited, which made things difficult in Hungary because Bartók was the great national composer. They didn't want to prohibit Bartók, and so his name was kept, but at concerts or on the radio you heard only the first string quartet or the sixth string quartet. They were tolerated, but the second quartet to the fifth not, the Music for Strings was not….And I had a very strong feeling that I had to write radically new music, not this

[40] Toop, 18.

[41] Steinitz, *Music of the Imagination*, 43-44.

> kind of pseudo-popular music, though all the time I was writing Hungarian folksong arrangements and choruses that were even performed and published.[42]

After graduation, he taught music theory at the Budapest Academy until 1956. During this period, he started to seek a new musical style:

> I started to experiment with simple structure of rhythm and sounds, in order to evolve a new music from nothing, so to speak. I regarded all the music I had known and loved up to then as something I couldn't use. I asked myself: what can I do with a single note: what can I do with the octave, or with interval, or two intervals, or a specific rhythmic situation.[43]

The solo piano work *Musica ricercata* (1951-53) proves this point well. Ligeti applied a new compositional method cycling through all twelve notes continually. For example, the first piece consists of only an A. The second piece conveys E, F#, and G. In this way, he extends the number of pitch classes until the last piece consists of all twelve pitches. Moreover, each piece represents a characteristic idea: the first five pieces emphasize rhythm and accents, No. 6 uses the mixolydian mode, No. 7 indicates the Ostinato technique, the title of No. 8 is *Homage to Béla Bartók*, and the No. 11 fugue is derived from Girolamo Frescobaldi's *Messa degli Apostoli*.[44] Overall, the musical texture becomes thicker and more complex as notes are added.

From 1954 to 1956, thanks to a gradual release of political tension, Ligeti began to encounter the works of Schönberg and Stockhausen. During this period, his compositional technique using chromatic clusters in the orchestral piece *Vízíok* (1956) anticipated his micro-polyphonic style of the next decade.[45] Unfortunately he had to hide many works during this time because of the Communist regime. Most of these works were published much later after he fled Hungary in December 1956.

After he escaped from Hungary with his wife, they settled temporarily in Cologne, Germany. His experience working in the Studio for Electronic Music of the Western German

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[42] Griffiths, *György Ligeti*, 10.

[43] Toop, 38.

[44] Steinitz, *Music of the Imagination*, 57.

[45] Griffiths, *György Ligeti*, 13-15.

Radio bore three electronic works: *Glissandi* (1957), *Artikulation* (1958) and *Piece électronique* No. 3 (1957-58). The Darmstadt New Music Festival also gave him the opportunity to catch up on new western styles and extend his own musical language he created in Hungary.

In Ligeti's analysis of *Structure Ia* by Pierre Boulez, published in 1958, Ligeti pointed out the inconsistency of serialism: duplication of twelve pitch classes, and the occurrence of tritones.[46] Ligeti aspired to find a new way to compose other than serialism. He created textural compositions, including the micropolyphonic technique that is characteristic of his work during the 1960s and 1970s, and he developed this technique in his orchestral and vocal pieces. Richard Toop defines micropolyphony as a dense counterpoint in which one can no longer hear the individual voices, but is simply aware of changing degrees of activity, and perhaps of broad movements in register from low and high, or vice versa.[47] Micropolyphony also exhibits an internally animated dense texture in which large numbers of instruments or voices play slightly different versions of the same line.[48]

The orchestral work *Apparitions* (1958-59), rearranged from his previous piece *Vízíok*, garnered him recognition in Europe, later winning first prize in the ISCM (International Society for Contemporary Music) competition. In this piece, he used several new techniques for coloration such as dense chromatic clusters, large contrasts in dynamics, new sounds with string instruments (stroking of the wood and bow), and long sustained notes. Another orchestral work *Atmosphères* (1961), one of his best-known works, brought international acclaim. In this piece, Ligeti achieved the static micropolyphonic sound, created by carefully planning each part. *Atmosphères* was featured in Stanley Kubrick's movie *2001: Space Odyssey*. Ligeti's one movement composition *Lontano* (1967) is more colorful in harmony and tone-color than his previous works.

From the late 1960s Ligeti continued to use micropolyphony, which emphasized melody, combining several layers of different voices. *Melodien* (1971) includes three basic layers: melody, ostinato-like figuration, and long sustained notes.[49] Similar melodic polyphony can be

[46] Steinitz, *Music of the Imagination*, 88-89.

[47] Toop, 70.

[48] Steinitz, *Music of the Imagination*, 103.

[49] Toop, 138.

found in *San Francisco Polyphony*, a work commissioned in celebration of the San Francisco Symphony Orchestra's sixtieth anniversary.

One of his compositional methods in vocal works through the 1960s and 1970s was the use of artificial language produced by phonemes and instrumental articulations. In his musical pieces for the stage, *Aventures* (1962) and *Nouvelles Aventures* (1962-65), text does not provide logical meaning but serves only as phonemic sound. Ligeti did not provide a plot, but the musical marking of each section indicated specific emotions. These artificial voices are sometimes overlapped like polyphony.

Published in 1963-65, *Requiem* synthesizes all the micropolyphonic techniques up to that time. In the first part, *Introitus*, Ligeti used micropolyphony to manifest transformation from darkness to light. Compared to the static micropolyphonic first part, the second part, *Kyrie,* includes active and complicated fugues reminiscent of Johannes Ockeghem's music in the sixteenth century. The last part, *Dies irae,* sounds dramatic and fearful and contains large contrasts in dynamics, intervals and tempi. Ligeti also offered a pictorial text for this part.

After he composed *Requiem*, he planned to make an "anti-opera" by exclusion of a plot. For this concept, he nearly inserted his imaginary world Kylwiria as a background with its artificial language also.[50] However, the idea of "anti-opera" was too abstract to be convincing, and Ligeti recognized the necessity of having a plot. In 1972 he decided to base his opera on the play *La Balade du Grand Macabre* written by Michel de Ghelderode. Finally, his opera *Le Grand Macabre* was performed on April 12, 1978, in Stockholm. In general, the content was very similar to the *Requiem*; for example, both works reflected the composer's own fear of death and the end of the world.[51] Another similarity between the two works is the use of a four part structure. A doorbell, alarm clock, a kettle, and other unusual instruments add special effects to a massive and grotesque orchestral sound.

Until the 1980s his major compositions were orchestral and vocal pieces. Even though Ligeti wrote a few keyboard works during this time, each of these represented his musical ideas. The first keyboard work after he left Hungary, *Volumina for Organ* (1961-62), opened new possibilities in sound and technique for the organ. Example 2.2 shows the unique graphic notations in this piece.

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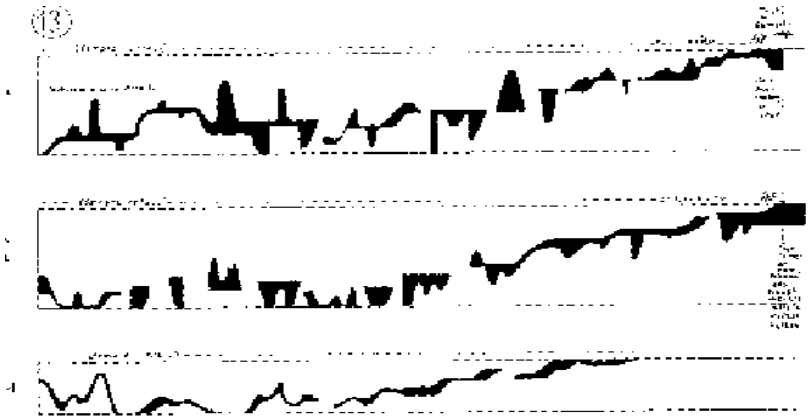
[50] Ibid., 153.

[51] Steinitz, *Music of the Imagination*, 220.



Example 2.2. *Volumina* for Organ, m. 13.[52]

In the *Two Etudes for Organ* (1967-69) he also experiments with new organ techniques: a new pedal, keyboard skill, and a new method for controlling air pressure. Ligeti achieved sound continuation by using extremely fast notes in the harpsichord work *Continuum* (1968). According to the tempo marking, he required the performer to play 14 to 16 notes in one second.

After *Le Grand Macabre*, Ligeti's health problems and the desire to find a new musical style resulted in a four year creative vacuum in his composition. During these years, he extended his curiosity to science and non-western music in order to find new methods of composition that did not follow the trend of many avant-garde and post-modern composers. In particular, fractal theory, chaos theory, African music and Conlon Nancarrow's complicated rhythmic works were important sources for his inspiration. These became the main influences for his use of polyrhythm and polymeter in the 1980s and 1990s. The first major piece of this period, *Trio for violin, horn and piano* (1982), shows his new enthusiasm for rhythmic experimentation.

According to Ligeti, he treated this piece as a detour to achieve the new compositional way without regurgitating the same old thing.[53] In this piece, he used a repeated rhythmic pattern called talea, a famous compositional device in the fourteenth and fifteenth centuries, and also the Rumanian traditional Aksak rhythm (see Chapter 3).[54]

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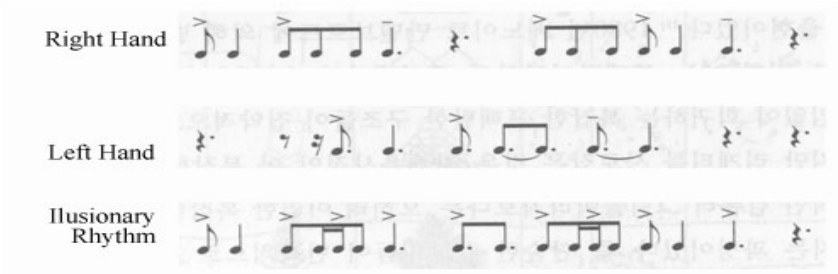
[52] György Ligeti, *Volumina, Musik für Orgel*. Henry Litolff's Verlag/C. F. Peters, N.5983, Frankfurt, 1973, 5.

[53] Toop, 189.

[54] Steinitz, *Music of the Imagination*, 258.

Piano Étude book 1, finished in 1985, won great admiration from both audiences and performers. His achievement was internationally recognized and Ligeti was awarded the prestigious Grawemeyer Award for *Étude* book 1. He originally planned to compose two books of études, but the second and third books were published successively by the end of 2001.[55] In his Piano Étude, Ligeti represented his wider stylistic changes of the 1980s. In general, the use of polyrhythm and polymeter, influenced by Central Africa and Nancarrow's music, is a main feature of these works. Moreover Ligeti reflected an image of mathematics inspired by fractal theory. These influences will be discussed in detail in Chapter 3.

Another major work from the 1980s is the *Piano Concerto* (1985). Dedicated to American conductor Mario di Bonaventura, the concerto was extended from the typical three movements to a total of five movements. Ligeti put his various compositional ideas of the 1980s into this work. For example, the first movement utilizes polymeter with two different meters in the right and left hands. Moreover, asymmetrical accents and groupings add complexity to the sound. The fourth movement, which Ligeti mentioned as "the central movement," presents fractal images.[56] A simple motive at the beginning gradually mutates and finally becomes dense in rhythm and texture. Through the recursive structure, this work has self-similarity which Ligeti describes as "always different yet similar."[57] The main idea for the third and the fifth movements comes from sub-Saharan African music. Above the fast regular pulsation, irregular accents between different voices create a new rhythmic pattern which was described as "illusionary rhythm" by Ligeti. Example 2.3 explains how the illusionary rhythm occurs.



Example 2.3. Rhythm of the Piano Concerto, Movement 5, mm. 3- 4

[55] Toop, 199

[56] Ligeti, "On My Piano Concerto," 11.

[57] Ibid., 12.

His *Violin Concerto* is a representative work of the 1990s. According to Ligeti, virtuosic violin pieces by Paganini, Bach, Ysaye, Wieniawski and Symanowski were models for this piece.[58] In it, he experiments with different kinds of intonation. To do this, Ligeti utilizes differently tuned instruments including traditionally tuned instruments, scordatura string instruments, and wind instruments that inflect notes microtonally. Some of the wind instruments included were ocarinas, slidewhistles and recorders for various colors and overtones. Through these instruments he attempted to bring out "wonderful new harmonics built on combinations of these overtones."[59] After the first performance in 1990, Ligeti revised the first movement and added the fourth and fifth movements. The piece was finally completed in 1993.

In the *Hamburg Concerto for Solo Horn and Chamber Orchestra*, composed from 1999 to 2002, Ligeti continued the harmonic experimentation which was used in the violin concerto. Overtones of four natural horns and two basset horns in the orchestra create unstable and dissonant harmonies. Furthermore, the soloist alternates between the natural horn and the modern valve horn above the continually dissonant orchestral sound. After the premier performance in 2001, Ligeti expanded the concerto by adding the seventh movement in 2002.

The last complete work of Ligeti's life time *Sippal, dobbal, nadihegeuvel* is a song cycle including seven poems by Sandor Weöres: *Fabula, Táncdal, Kínai templom, Kuli, Alma,álma, Keserédes* and *Szajkó*. The title of the collection came from a children's song in Hungary. Like Weöres poem, this piece contains simultaneous Hungarian rhymes. Ligeti used only percussion for the accompaniment. Between voice and percussion sounds, the music achieves a strong climax. In order to produce a non-western sound, Ligeti uses a gong, glockenspiel, marimba, and bells.

In 1996 the plan to record Ligeti's complete works, including all of the early Hungarian works, began under Sony Classical. Vincent Meyer, a French bank heir, financially supported this project. However, it came to a halt after eight CDs were completed due to several issues: lack of rehearsal, miscommunication between performers and composer, financial difficulty, hectic orchestra schedules, and Ligeti's desire for perfection. Fortunately the Teldec CD company took over the project in 2001, and it was completed in 2003.

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[58] Steinitz, *Music of the Imagination*, 331.

[59] Ibid., 333.

In the early 1980s, after the success of his opera *Le Grand Macabre*, Ligeti planned to compose a new operatic work which would be based on Shakespeare's *The Tempest*. However, he changed the scenario to Lewis Carroll's *Alice's Adventures in Wonderland* and decided it would be a theatrical fantasy or a revue around 1990.[60] Unfortunately, this work did not materialize prior to his death in 2006.

[60] Ibid., 343.

CHAPTER 3
COMPOSITIONAL INFLUENCES ON THE PIANO ÉTUDES OF GYÖRGY LIGETI

Ligeti's Piano Études may well be the most performed and talked about piano music written in the past three decades. They are brilliantly composed and contain much virtuosity, humor, and intelligence. Ligeti originally planned to compose two sets of Piano Etudes similar to Debussy's *Preludes* or *Images* when he published the first book in 1985.[61] However, he composed the second and third books successively through 2001. Unfortunately, the composer's hope to create the fourth book could not be realized because of his death in 2006.[62] The following chart shows the contents of the Piano Études by Ligeti.

Table 3.1. Titles of Ligeti's Piano Études

Book I

Title of Piece	English translation
1. Désordre	Disorder
2. Cordes á vide	Open strings
3. Touches bloquées	Blocked keys
4. Fanfares	Fanfares
5. Arc-en-ciel	Rainbow
6. Automne á varsovie	Autumn in Warsaw

Book.II

7. Galamb Borong	
8. Fém	Metal
9. Vertige	Dizziness
10. Der Zauberlehrling	The Apprentice Magician

[61]Toop, 199.

[62]Ibid.

11. En suspens	In suspense
12. Entrelacs	Interlacing
13. L'escalier du diable	The Devil's Staircase
14. Coloana infinită	The infinite Column
14.a.Coloana fără sfârşit	Same as the 14, but for player piano

Book.III

15. White on White	
16. Pour Irina	For Irina
17. À Bout de Souffle	Out of Breath
18. Canon	

In the 1980s, Ligeti's intellectual curiosity about a variety of fields (science, math and African music) opened the way to new compositional devices. These Études display his compositional style during the period. As Ligeti mentioned in his article "On My Études for Piano," the center of his compositional intention in the Études was new concepts of rhythmic articulation including polyrhythm and polymeter.[63] Polyrhythm means the simultaneous use of strikingly contrasted rhythm in different parts of the musical fabric, and similarly polymeter is created from the simultaneous use of two or more meters. [64] His first attempt to employ polyrhythm was made earlier in his *Poeme Symphonique* with 100 metronomes that create the effects of superimposing rhythmic grids in various layers. Later, in his works *Continuum for Harpsichord* and *Monument for Two Pianos,* he experimented with the concept of illusionary rhythm, in which the individual parts are composed in such a way that when heard together they lead the listener to perceive "virtual" rhythm that is not actually present.[65]

In order to achieve polyrhythm and polymeter in the Piano Études, Ligeti synthesized several formal techniques. For example, he applied hemiola. In terms of rhythm, it refers to the

[63] Ligeti, "On My Étude for Piano," 3.

[64] *The Harvard Concise Dictionary of Music and Musicians*, 1999, edited by Don Michael Randel, s.v. "Polyrhythm" and "Polymeter."

[65] Toop, 195.

use of three notes of equal value in the time normally occupied by two notes of equal value. The resulting rhythms can be expressed in modern terms as a substitution of 3/2 for 6/4 or as two measures of 3/4 in which quarter notes are tied across the barline.[66] Also the highly complicated rhythmic figures in Conlon Nancarrow's player piano music inspired Ligeti to achieve very complex polyrhythm performed by a live performer. Furthermore, his interest in African music encouraged Ligeti's rhythmic experimentation and he tried to imitate the sound of Gamelan music in his Piano Études. Outside of music, the fractal and chaos theory in mathematics made an impact on his compositions, even though Ligeti rejected the assumption that these theories influenced his music directly. The composer commented:

> It would however be inappropriate to assume that my Piano Études are a direct result of these musical and extra musical influences. By revealing my interests and inclination I am merely indicating the intellectual environment in which I work as a composer. Moreover, in my music one finds neither that which one might call the "scientific" nor the "mathematical" but rather a unification of constructions with poetic, emotional imagination.[67]

Conlon Nancarrow (1912-1997)

Nancarrow was regarded as one of the most unusual composers of the twentieth century because he was one of the first to use the piano as a mechanical device. Born in Arkansas, he went to study in Ohio and in Boston, where he chose to join the Communist Party. For this reason, Nancarrow was forced to move to Mexico, where he had a solitary life and composed most of his major works. Before the mid-1980s, only a few composers recognized his music.[68]

In the 1930s, Henry Cowell (1897-1965) published a treatise entitled *New Musical Resources.* In this document, he introduces a new rhythmic notation that superimposes rhythms from equal divisions of a common beat.[69] Cowell suggested using a player piano to create very

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[66] *The Harvard Concise Dictionary of Music and Musicians*, 1999, edited by Don Michael Randel, s.v. "Hemiola."

[67] Ligeti, "On My Étude for Piano," 5.

[68] Steinitz, *Music of the Imagination*, 268.

[69] Kyle Gann, *The Music of Conlon Nancarrow* (New York: Cambridge University Press, 1995), 1.

complicated rhythmic performances, but he never experimented with this idea. Several years later, Conlon Nancarrow took over the idea and applied it to his works.

Before Nancarrow read Henry Cowell's treatise in 1939, he was not engaged in rhythmic experimentation. His *Sarabande and Scherzo for Oboe, Bassoon and Piano* (1930) contains traditional rhythmic progressions and resembles the disjunct intervallic style used by Bartók and Messiaen.[70] Beginning in 1941, Nancarrow's rhythmic experimentations became more evident. In his *Sonatina for Piano* (1941), the first work recomposed in Mexico, he tried to achieve rhythmic and contrapuntal variety including polyrhythm. However, performers were not able to play his complex polyrhythmic works.

After several years of trial and error, he began to use a player piano (1947) as suggested by Henry Cowell. By using this instrument, he achieved the complex polyrhythm which he desired, however he spent a huge amount of time punching the holes.[71] Nancarrow began to compose his major works, *Studies for Player Piano,* consisting of fifty-one short pieces from 1951. At that time, he rebuilt the key mechanism of the player piano in order to produce a greater dynamic range.

Between 1950 and 1968 he developed his main compositional style that synthesizes several kinds of music into complex polyrhythmic contrapuntal canons. The most significant character of his player piano compositions is that the complex polyrhythm may be executed at amazingly fast tempo without any mistakes. However, an early review pointed out the result is a mechanical sound that lacks expression.[72] During the 1970s Nancarrow's recordings and scores were released to the public.

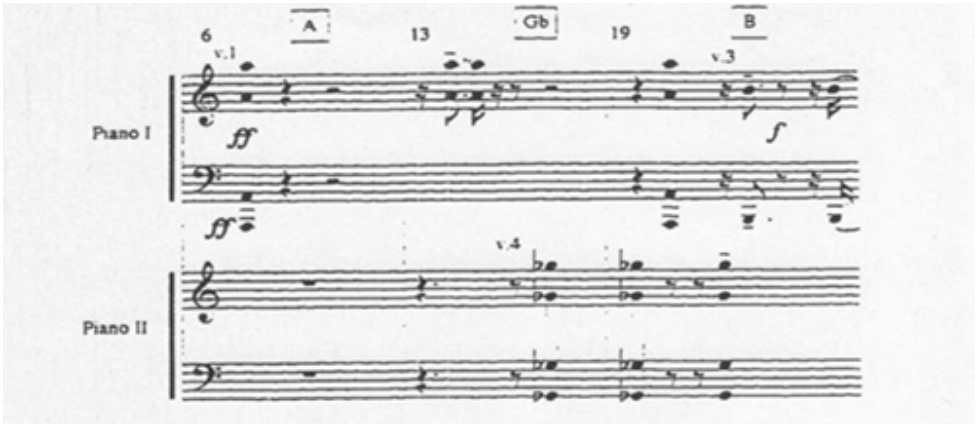
In 1980 Ligeti happened to purchase Nancarrow's recordings from a record shop in Paris, and he marveled at them. The complicated polyrhythmic layers produced by the player piano were fascinating to Ligeti and gave him a new compositional direction. In general, Nancarrow used abnormal time signatures such as 18/8, 24/8 and 5/16. His dense polyrhythm is made by using several different tempos among multiple voices. For example, his *Study #37* consists of twelve different tempo markings and voices. Ligeti mentioned some similarities between his

[70] Ibid., 52.

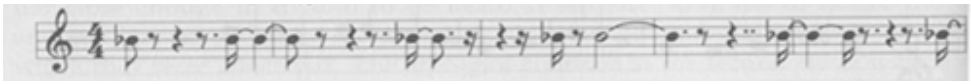
[71] Nancarrow wrote initially on manuscript paper, then punched holes himself in the long piano rolls, a hugely laborious task since even a single mistake required one to start all over again. Steinitz, 268.

[72] Ibid.

work *Monument-Selbstportrait-Bewegung* (1976) and Nancarrow's *Study #20* (1948-1960).[73] The coincidental similarities, asymmetrical rhythmic patterns, and effective use of the octave in both pieces represented a surprising and "astonishing analogy" for Ligeti.[74] Examples 3.1 and 3.2 show the similar openings of these works.



Example 3.1. Ligeti *Monument* for Two Pianos, m. 1



Example 3.2. Nancarrow Study # 20, mm. 1-4

After he was inspired by Nancarrow, Ligeti decided that rhythmic experiments would be the focus of his new Piano Études. Furthermore, he wanted to pursue the possibility of a single soloist playing the complex polyrhythms in his Piano Études. Ligeti commented that "the music of Nancarrow is so utterly original, enjoyable, constructive and at the same time emotional. And it is the best music by any living composer of today." [75]

[73] Griffith, *György Ligeti*, 96.

[74] Ibid.

[75] Larry Rohter, "Conlon Nancarrow: On a Roll" New York Times, 13 October 1987, 27.

In 1982, Nancarrow finally received recognition through the prestigious MacArthur Award. In the early 1990s he suffered a stroke and pneumonia; he died in 1997.

Fractal Theory

The concept of fractal theory, a branch of chaos theory, was created by mathematician Benoit B. Mandelbrot in 1982. This theory was developed to explain in detail the immense complexity of nature. The word "fractal" literally means "broken" and originally referred to fractional dimensions and irregular surfaces.[76] A fractal is a geometric figure in which a single motif is repeated in a continuously decreasing scale. When examining just a small part of a fractal, the smaller part looks similar to or exactly like the whole fractal. Therefore, almost all fractals are at least partially "self-similar."[77] In other words, a part of the fractal is identical to the entire fractal itself but on a smaller scale. Examples 3.3 and 3.4 show fractal images.

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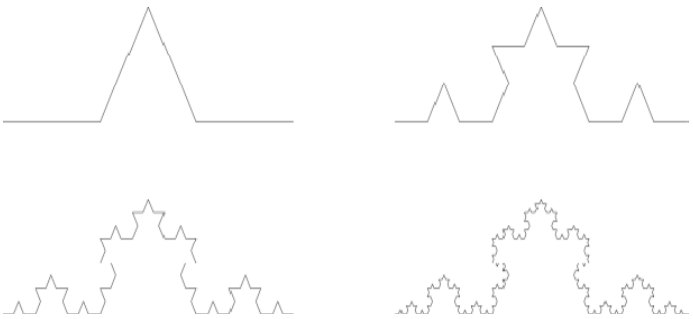
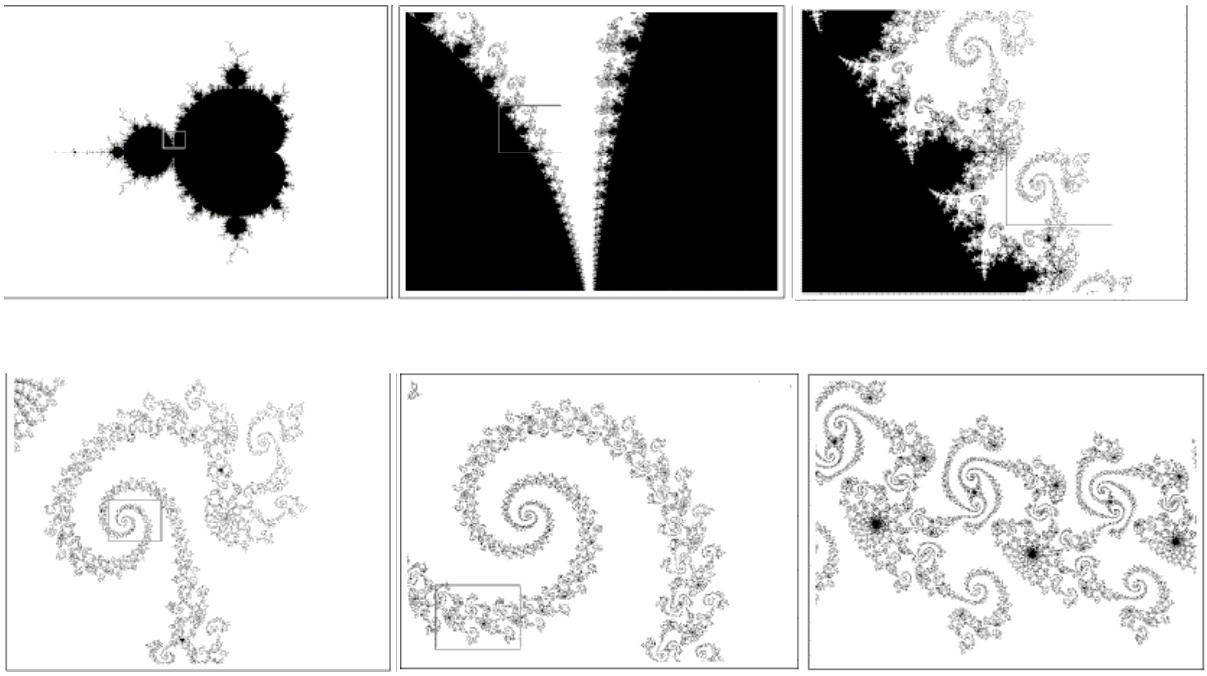


Example 3.3. *Curve* by Helge von Koch[78]

[76] http://dictionary.references.com/browse/fractal; accessed 9 September 2008.

[77] Richard Steinitz, "Music, Maths & Chaos," *The Musical Times* 137 (March 1996), 16.

[78] http://abyss.uoregon.edu/js/image/koch_curve.gif: accessed 3 September 2008.



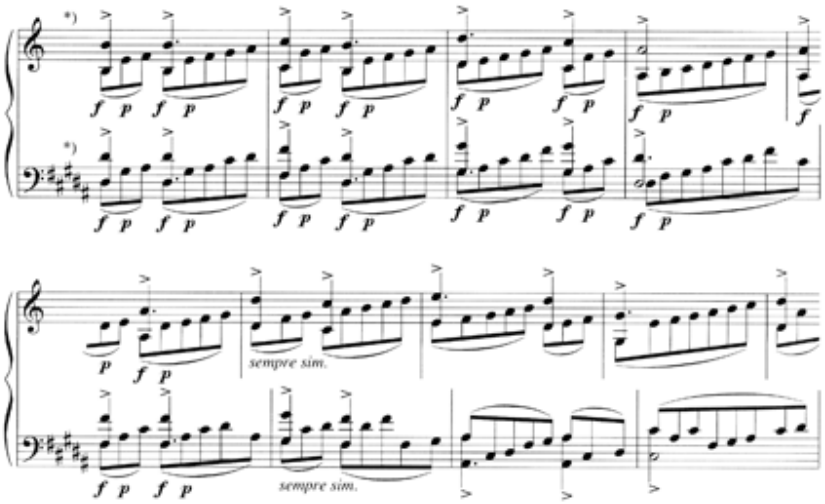
Example 3.4. Fractal Set by Benoit Mandelbrot[79]

In 1984, Ligeti saw several fractal graphics from the *The Beauty of Fractals* created by Heinz-Otto Peitgen.[80] As a composer who had as a young man intended to be a scientist, it is not surprising that fractal geometry theory would intrigue him. In particular, the fractal images convey huge complexity with well-organized self-similarity in the small divisions, which gave Ligeti a new compositional approach. He was also interested in chaos theory, which states that a small distortion during a regular cycle produces unpredictable complexity. Though Ligeti denied that his music was directly influenced by science or math, he is one of the first composers to have attempted a musical representation of fractal and chaos theories in his Piano Études and Piano Concerto. He attempts to create music that is self-similar and recursive without being repetitive, resulting in a complex fabric of recurring motives that are subtly different each time.

[79] http://wynchar.com/.../overviewof complexity.html: accessed 3 September 2008.

[80] Steinitz, *György Ligeti: Music of the Imagination*, 273.

His Étude No. 1, *Désordre,* represents fractal and chaos theories. These theories try to find some order in disorder, but instead, Ligeti creates a complicated disorder from the order. At the beginning of *Désordre*, the rhythmic patterns are synchronized; but at the end of the fourth measure, the composer begins to distort the rhythm of the right hand. He accomplishes this by moving one eighth note ahead gradually until the end of the music. This causes an alteration of the accent, resulting in chaotic complexity of rhythm. Example 3.5 shows the chaotic variations of the rhythm.



Example 3.5. Ligeti Piano Étude No. 1, mm. 1-8

African Music

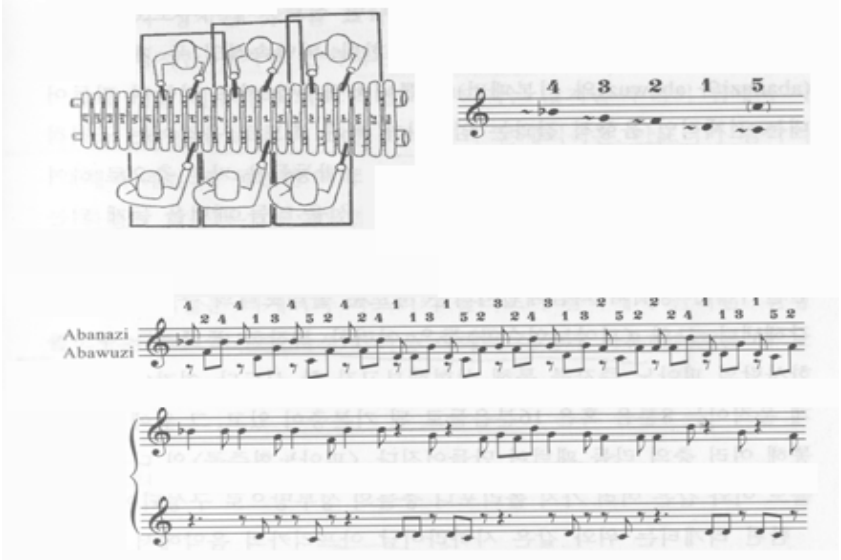
Ligeti's interest in various rhythmic patterns of non-western music, including those of Latin America, the Caribbean, Brazil, and Southeast Asia became evident in the 1970s. After listening to a recording of Central African Music from one of his students Roberto Sierra, his interest in African music grew rapidly.[81] This recording was made by the Israeli ethnomusicologist, Simha Arom, who had investigated African music since the 1960s and had written many transcriptions. In 1984 Ligeti met him and saw the transcriptions. Later Ligeti

[81] Toop, 185.

wrote the preface for Arom's book, *African Polyphony and Polyrhythm,* where he explained the attractiveness of African music.

> Gradually, through repeated listening, I became aware of this music's paradoxical nature: the patterns performed by the individual musicians are quite different from those which result from their combinations. In fact, the ensemble's super pattern is in itself not played and exists only as an illusionary outline. I also began to sense a strong inner tension between the relentlessness of constant, never-changing pulse coupled with the absolute symmetry of the formal architecture on the one hand and the asymmetrical internal divisions of the patterns on the other. What we can witness in this music is a wonderful combination of order and disorder which in turn merges together producing a sense of order on a higher level.[82]

As can be seen in Example 3.6, complicated polyrhythmic patterns are created in sub-Saharan African music. Two groups of performers sit opposite one another and play different patterns at a quick pace. As a result, two different patterns combine to create a new illusionary rhythmic and melodic pattern simultaneously.



Example 3.6. Akadinda sub-Saharan Ensemble.[83]

[82] Simha Arom, *African polyphony and polyrhythm*, translated by Martin Thom, Barbara Tuckett and Raymond Boyd (New York: Cambridge University Press, 1991), xvii.

[83] Gehard Kubik, "Kognitive Grundlagen afrikanischer Musik," in *Musik in Africa*, ed. Artur Simon (Berlin: Museum für Völkerkunde, 1983), 384.

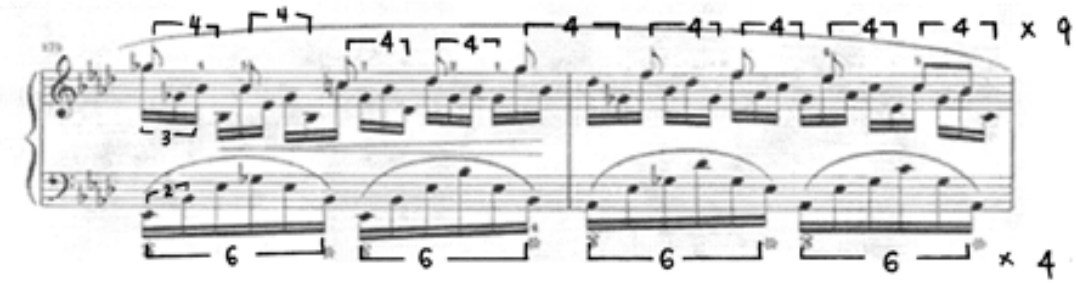
From sub-Saharan music, Ligeti applied patterns of motion and illusionary sound to his Piano Études. Ligeti writes:

> In Africa, cycles or periods of constantly equal length are supported by a regular beat (which is usually danced, not played). The individual beat can be divided into two, three, sometimes even four or five "elementary units" or fast pulses. I employ neither the cyclic form nor the beats, but use rather the elementary pulse as an underlying gridwork. [84]

Études No. 1, 3 and 6 represent characteristics of African music including polyrhythm. Detailed analyses of polyrhythm will be provided in Chapter 4.

Hemiola

Ligeti mentioned two distinct musical thought processes that he explored in his Études: the meter-dependent hemiola as used by Schumann and Chopin, and the additive pulsation principle apparent in African music.[85] The standard type of hemiola is found in a measure of six beats, which can be divided into two or three. Ligeti cited this example to show the complexity of the hemiola in Chopin's Ballade.



Example 3.7. Chopin Ballade No. 4, mm. 175-176

In this example, the right hand triplets competes with the group of four sixteenth notes to create the melody. The smallest unit has a 2:3 ratio between the left hand and the right hand.

[84] Liner Notes, Erato ECD 75555, 1990.

[85] Ligeti, "On My Étude for Piano," 5-6.

However, in the larger phrase, the right hand plays the group of four sixteenth notes nine times, and the left hand repeats the group of six sixteenth notes four times (a 9:4 ratio). Ligeti extended this concept with more complexity using ratios such as 5:3, 7:5, and 7:5:3. He produces that "the shimmering effect of simultaneously dividing the bar into two and three procedures the metric tension which in itself is one of the strongest attractions of the music of Chopin, Schumann, Brahms and Liszt."[86]

He achieved polytempo by breaking through the barriers of the bar line. In some of his pieces, the bar line serves an optical purpose for the performer and does not represent the meter. Therefore several different rhythmic patterns are able to co-exist. Similar rhythmic usage can be found in African music and works by the fifteenth-century composer, Johannes Ockeghem. The detail example of Ockeghem and Ligeti's works will be discussed in Chapter 4.

Béla Bartók

Bartók was the first premier composer of modern music in Hungary. Even though Ligeti never met Bartók, he was exposed to the new style of music by studying Bartók's works. In particular, Ligeti focused on the use of folk rhythm and melodies. In several of his Piano Études, homage to Bartók can be found. Études No. 1 and 4 convey a Bulgarian rhythmic pattern called Aksak, which was often used by Bartók. Aksak, an important pattern in the rhythmic structure of folk and vernacular traditional music of the Middle East, is characterized by combinations of unequal beats, such as 2+3 and their extensions, particularly 2+2+2+3. Called Bulgarian rhythm by the Hungarian composer and ethnomusicologist Bartók, the concept also includes divisions of the eight-beat structure common in western music into unequal subdivisions, such as 2+3+3. As non-western music and eastern European folk music began to exert influence in the west, Aksak rhythms found their way into the works of a number of twentieth-century composers of western art music, Bartók and Stravinsky foremost among them.[87]

[86]Ibid., 4.

[87] In Encyclopædia Britannica. http://www.britannica.com/EBchecked/topic/11771/aksak (accessed July 16, 2008).

Gamelan Music

A gamelan is defined as an Indonesian musical ensemble which is made of metallophones, drums, and gongs. Bamboo flutes and vocalists might also be included. Because of the combinations of different instruments, there is a wide variety in gamelan ensembles. In general, gamelan ensembles can be grouped by geography, such as the Balinese, Javanese, or Sundanese. In Balinese gamelan, it is more accurate to characterize musical time as cyclical or regenerative. The music normally returns repeatedly to the same 'point.' This reflects the importance of reincarnation in Hindu belief.[88] The most recognized style of ensemble comes from the Balinese *Gamelan gong kebyar*, which is often associated with virtuosity and rapid changes of tempo and dynamics.[89] Utilizing more than twenty percussion instruments, the *Gamelan gong kebyar* can make very colorful sounds.

Ligeti was most interested in the tuning system used in gamelan music. It is difficult to describe the gamelan instruments in terms of intervals, because they use a variety of tunings. Unlike the western tuning system, a definitive pitch for each note is not fixed. Slendro and Pelog are the two most common tuning systems in gamelan music. Pelog is a seven-pitch non-equidistant tuning system; the intervals between pelog pitches vary in size from small (about 90 cents) to large (more than 400 cents).[90] Slendro is a five-pitch equidistant tuning system: the intervals between pitches are about the same size (240 cents).[91] When the instruments are performed in pairs, which are tuned to slightly different pitches, gamelan ensembles produce an "agitated" and "shimmering sound" because of the interference beating.[92] Ligeti tried to achieve a similar effect in his piano writing. He commented that: "Imaginary gamelan music is neither chromatic nor diatonic, nor based on whole tones, hidden away in the normal tempered tuning of the piano."[93]

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[88] Michael Tenzer, *An Introduction to Balinese Music* (Seattle: Periplus Editions, 1991), 41.

[89] Ibid., 77.

[90] Henry Spiller, *The Traditional Sounds of Indonesia* (Santa Barbara: ABC-CLIO, Inc., 2004), 66.

[91] Ibid.

[92] Tenzer, 33.

[93] Steinitz, *Music of the Imagination*, 300.

Ligeti experimented with these Indonesian tuning systems in his piano concerto (see Chapter 2). He used it in again later in the violin concerto (see Chapter 2). He openly confirmed that his Piano Étude No. 7, *Galamb Borong,* was a step on the road leading to the hybrid tunings and exotic sonorities of the violin concerto.[94]

Conclusion

The influences on Ligeti's music were presented in this chapter. In order to understand his works, the knowledge of these aspects is necessary because Ligeti achieved his own musical style by combining these influences. Especially his rhythmic features in the later works can be found in African music and Nancarrow's player piano music. In the next chapter, these detailed rhythmic features of Ligeti's Piano Études will be discussed.

[94] Ibid.

CHAPTER 4
LIGETI'S PIANO ÉTUDES: A POLYRHYTHMIC STUDY

Ligeti completed his first set of *Études pour piano, premier livre* in 1985. The second book, *Études pour piano, deuxième livre,* was published almost ten years later in 1994.[95] Although each of these pieces contains its own characteristics mentioned in the previous chapter, the use of polyrhythm is the common feature. The purpose of this chapter is to observe Ligeti's use of polyrhythm in the Piano Études. The general similarities of polyrhythm among the pieces and two different features of polyrhythm will be discussed. The analyses of the musical excerpts are not for theoretical purposes, but to assist the performer.

General Similarities of Polyrhythm in Ligeti's Piano Études

Hemiola

Hemiola is a fundamental concept of the polyrhythm in Ligeti's Piano Études. As mentioned in Chapter 3, Ligeti directly pointed out that hemiola, used earlier by Schumann and Chopin, is one of the basic ideas of these pieces. [96] The standard type of hemiola is found in a measure of six beats, which can be divided into two or into three. Ligeti cited a part of Chopin's *Ballade* to show the complexity of the hemiola (see Example 3.6). Like this example, Ligeti creates polyrhythm in his Piano Études by combining hemiola between the two hands.

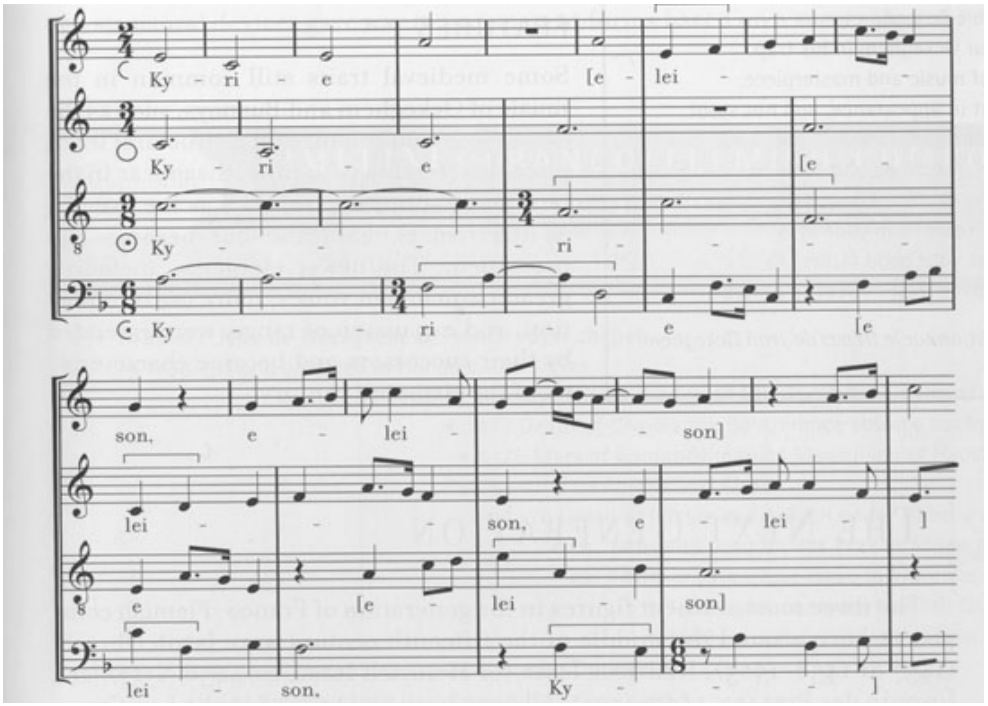
Abnormal Function of the Bar Lines

Ligeti breaks free from the barriers created by bar lines in order to use hemiola more easily, which results in a complicated polyrhythm. The bar line serves an optical purpose for the performer and does not represent the particular meter. Therefore several different rhythmic patterns may co-exist. The similar treatment of rhythm and bar lines can be found in the works of the fifteenth century composer Johannes Ockeghem, who wrote a "Mensuration Canon" that implies several voices moving at different rates of speed. Ockeghem does this by using

[95] Ibid., 391-392.

[96] Ligeti. "On My Étude for Piano", 5-6.

different mensuration signs, the "time signatures" of early music.[97]



Example 4.1. Ockeghem, Opening of *Kyrie* from *Missa Prolationum*[98]

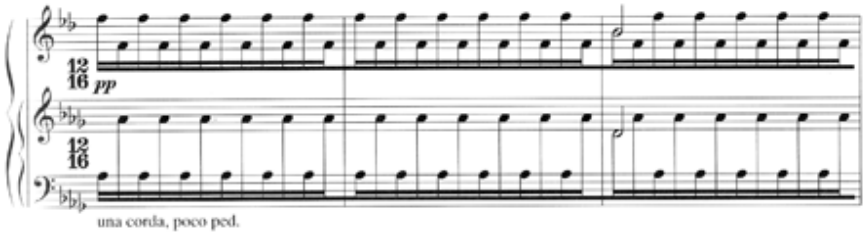
The writing in Ligeti's Études is often similar to this example by Ockeghem. For example, throughout the entire Étude No. 1, *Désordre,* the bar lines are scattered and only the first three measures provide traditional bar lines (see Example 3.5).

No. 7, *Galamb Borong,* shows similar usage of rhythmic materials. Unlike Étude No. 1, *Désordre*, Ligeti uses a time signature of 12/16 with the bar lines synchronized vertically. However, they act only as a guide. In reality the piece has no proper meter, and the bar lines do

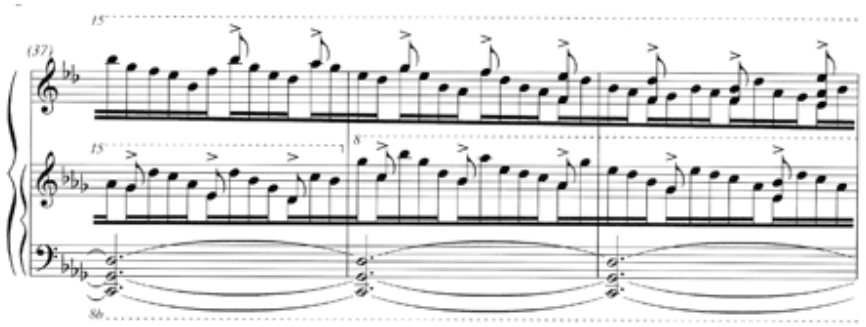
[97] J. Peter Burkholer, Donald Jay Grout, and Claude V. Palisca, *A History of Western Music* 7th ed (New York: W.W. Norton & Company, 2005), 197-198.

[98] Ibid.

not indicate any structure.[99] Since the bar line is not prominent, this Étude has a structure of additive pulsations with a background of sixteenth notes.



Example 4.2. Ligeti Piano Étude No. 7, mm. 1-3

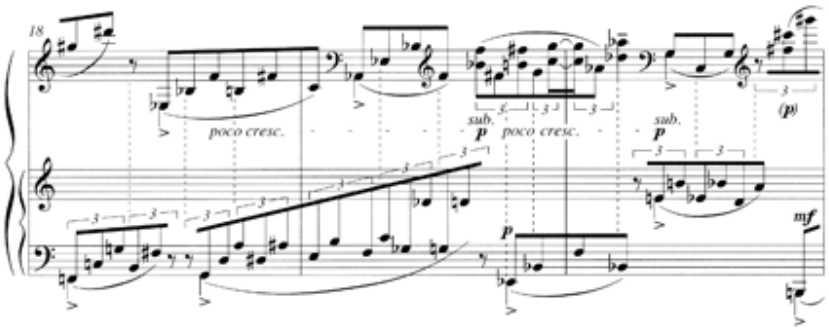


Example 4.3. Ligeti Piano Étude No. 7, mm. 37-39

Ligeti also uses dotted lines to align specific notes between the hands as a visual aid.[100] The multiple parts which include different rhythmic patterns in Étude No. 2 *Cordes á vide* represent a necessity of the dotted lines.

[99] György Ligeti, *Étude pour piano deuxième livre* (New York: Schott, 1998), 4.

[100] Mayton K. Tsong, "Études pour Piano, premier Livre of György Ligeti: Studies in Composition and Pianism," M.M. diss., (Rice University, 2001), 17.



Example 4.4. Ligeti Piano Étude No. 2, mm. 18-20

Compositional Methods of Polyrhythm in Ligeti's Piano Études

From a wide point of view, Ligeti's methods of polyrhythm in the Piano Études can be divided into two groups. In the first of these, the cross-accentuation of the melodic line creates polyrhythms. Concurrently, the perpetual notes serve as an additive pulsation. In this case, the suggested time signature may not serve the traditional function of indicating the meter. Representative similar usage can be found in Conlon Nancarrow's works. He explains that "the melodic line is simply a crutch in order to realize certain temporal ideas."[101] By varying the cross-accentuation, several different rhythmic patterns such as "poly-temporal relationships" exist, but the dominant rhythmic pattern may hardly be found. [102]

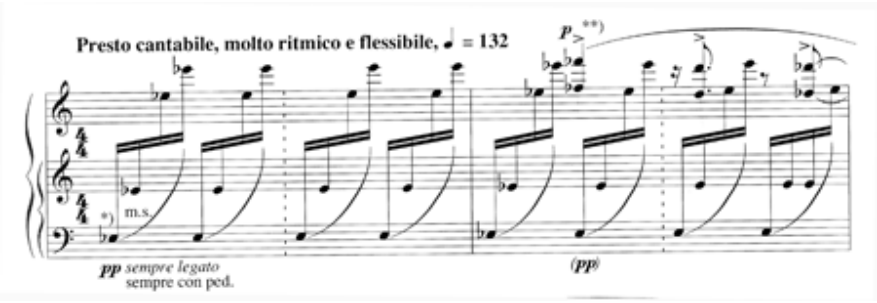
The second group includes Études that contain the cyclical rhythmic taleas, which are continuously repeated like an ostinato. The polyrhythm occurs when the different rhythmic taleas of multiple layers are performed together in equal periods of time. This method takes its influence from African music. Of course, these two methods of incorporating polyrhythm are often used within the same work.

[101] Conlon Nancarrow in an interview by Roger Reynolds, "Conlon Nacarrow: Interview in Mexico City and San Francisco," *American Music*, II/2 (Summer 1984) 6.

[102] Tsong, 21.

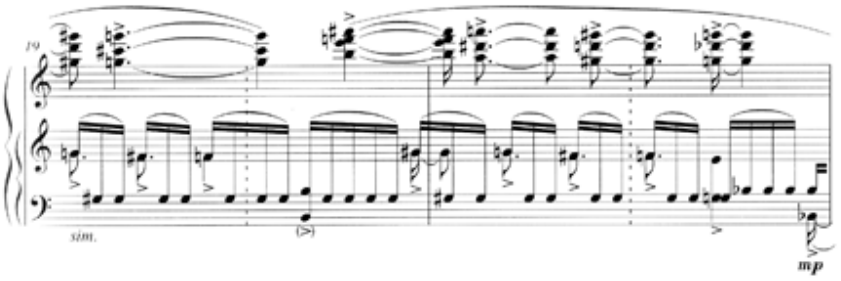
Influence of Nancarrow's Polyrhythm

Ligeti's Piano Étude No. 6 *Automne á Varsovie,* shows the influence of Nancarrow's works. The broken octave E-flats in sixteenth notes serve as the additive pulsation. This pulsating pattern is played throughout the whole piece as an ostinato. In the beginning section, the melodic line of Ligeti's *lament motif* (see chapter 2) appears every five sixteenth notes with a 5:4 ratio between the hands.

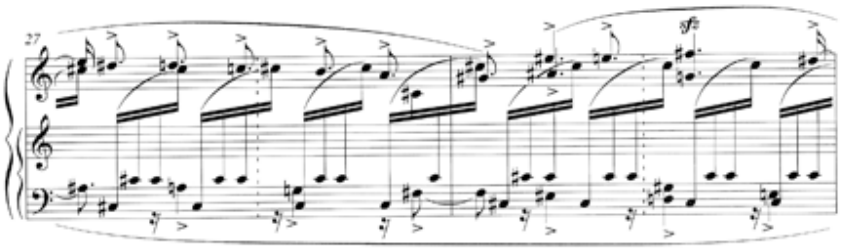


Example 4.5. Ligeti Piano Étude No. 6, mm. 1-2

A few measures later, the ostinato is grouped into three sixteenth notes, resulting in a 5:3 ratio. In measure 27, another melody in the right hand appears in groups of three sixteenth notes, while the previous melodic pattern (a group of the five sixteenth notes) continues in the left hand. This creates a 3:4:5 ratio between the two melodies and an ostinato pattern.

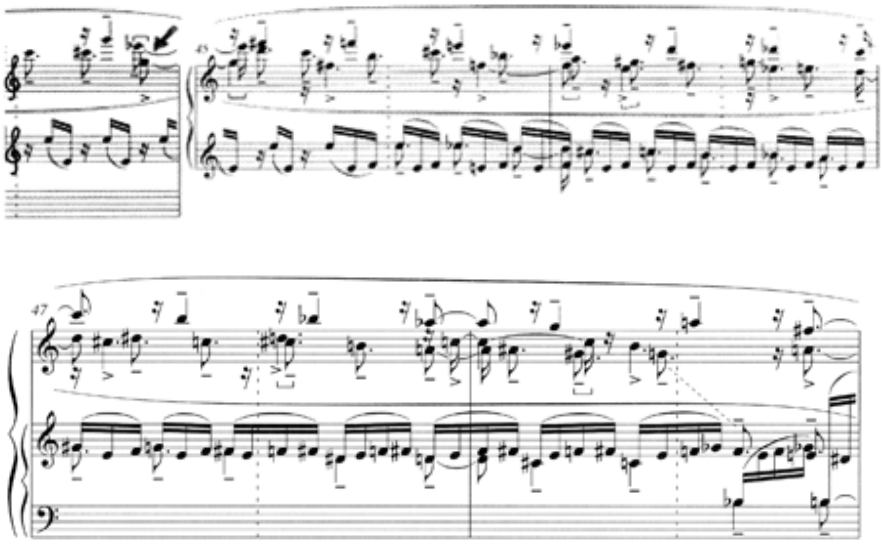


Example 4.6. Ligeti Piano Étude No. 6, mm. 19-20

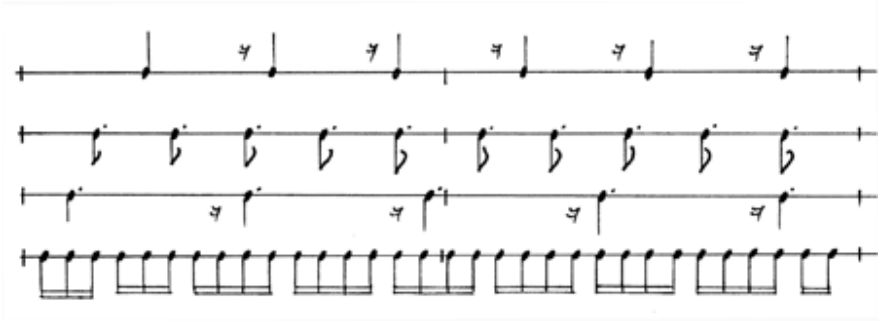


Example 4.7. Ligeti Piano Étude No. 6, mm. 27-28

As can be seen in Example 4.8, the most complicated polyrhythm starts from the last note (G5, as shown by the arrow) in the right hand in measure 44. Like the previous section, Ligeti added one more voice from this G, grouping seven sixteenth notes to produce complexity. Finally four voices make 3:4:5:7 rhythmic ratio (see Example 4.9).

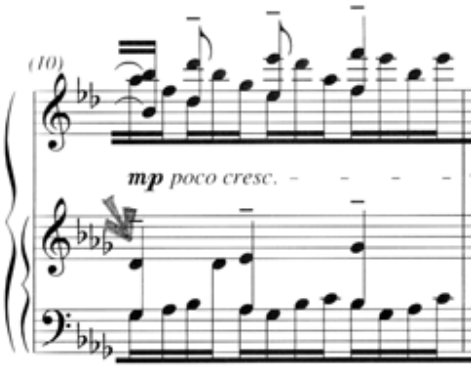


Example 4.8. Ligeti Piano Étude No. 6, mm. 44-48.

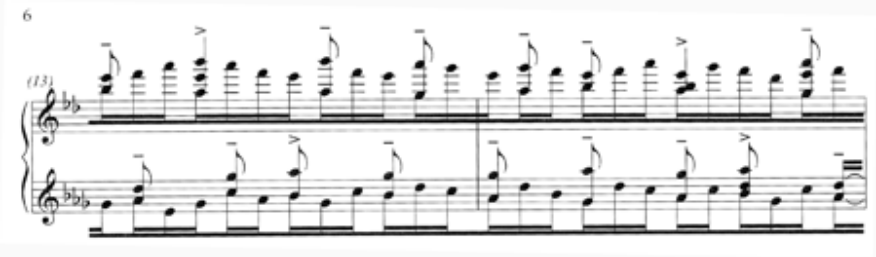


Example 4.9. Polyrhythm in Ligeti Piano Étude No. 6, mm. 47- 48.

Ligeti's Piano Étude No. 7, *Galamb Borong*, also represents the polyrhythmic elements of Nancarrow's works. *Galamb Borong* shows the use of complex polyrhythm between melodic lines and additive pulsation (repeated sixteenth notes). The melody is often in eighth, quarter, or half notes. In the beginning section, a simple melody in octaves is added above the basic pulsation. This melody is then manipulated through rhythmic diminution from half notes to quarter notes to eighth notes. The first polyrhythm appears in measure 10 by adding a different rhythmic grouping from the additive pulsation (shown by the arrow). Therefore, the group of three and four eighth notes (3:4 ratio) compete with each other respectively, and these rhythmic patterns are varied with the ratios 2:3 and 4:5 in measures 13-14.

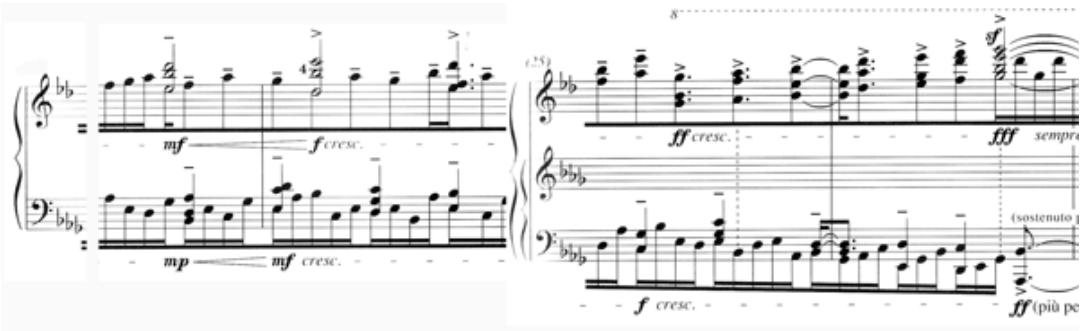


Example 4.10. Ligeti Piano Étude No. 7, m. 10

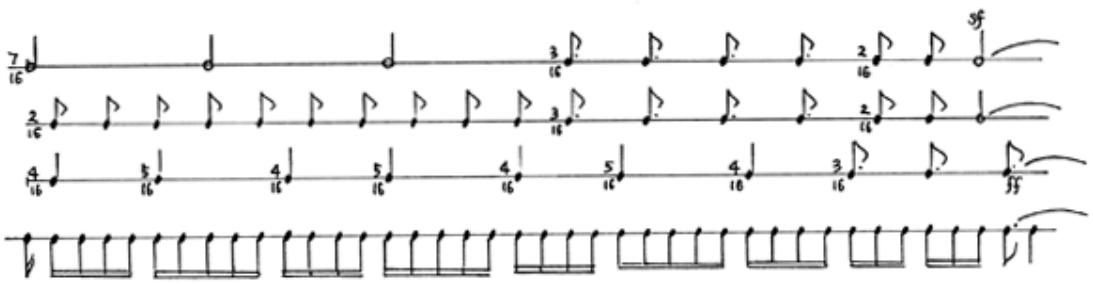


Example 4.11. Ligeti Piano Étude No. 7, mm. 13-14

Beginning in measure 22, more complicated polyrhythms can be observed. In measure 23, the right hand core melody changes from a sixteenth note pattern to an eighth note pattern. Therefore a total of four voices contribute to the polyrhythm in this section, including three core melody voices and one voice for pulsation. Observe this in Example 4.12 and 4.13.

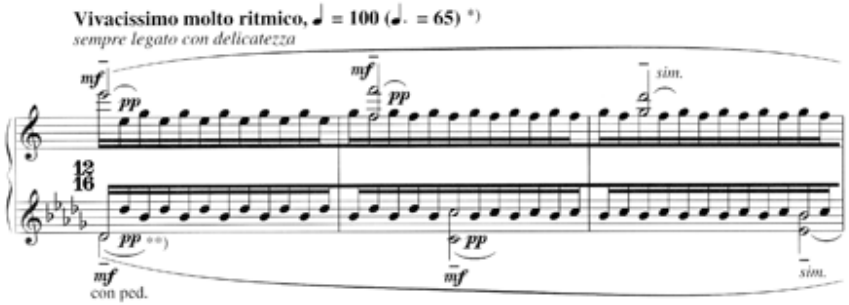


Example 4.12. Ligeti Piano Étude No. 7, mm. 23-26



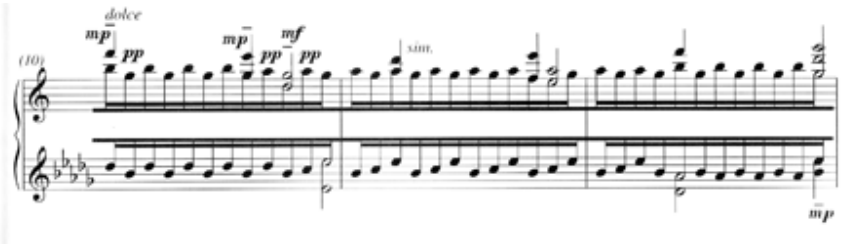
Example 4.13. Polyrhythm in Ligeti Piano Étude No. 7, mm. 23-26

The beginning section of the Piano Étude No. 12 *Entrelacs* represents similar features to *Galamb Borong*, as the sixteenth notes serve as the additive pulsation. The right hand melody provides a group of thirteen sixteenth notes while the left hand presents a group of seventeen. These two different patterns create rhythmic ambiguity from the beginning of the piece.



Example 4.14. Ligeti Piano Étude No. 12, mm. 1-3

However, this section does not sound like polyrhythm because the hands share the melody in an interlocking technique. One may begin to hear the polyrhythm beginning in measure 10, which is similar to the previous *Galamb Borong*. The new rhythmic pattern, which begins with the entrance of quarter notes, is built in groups of seven sixteenth notes. This is added above the basic pulsation and repeated continuously. As result, a polyrhythm occurs between the two hands.

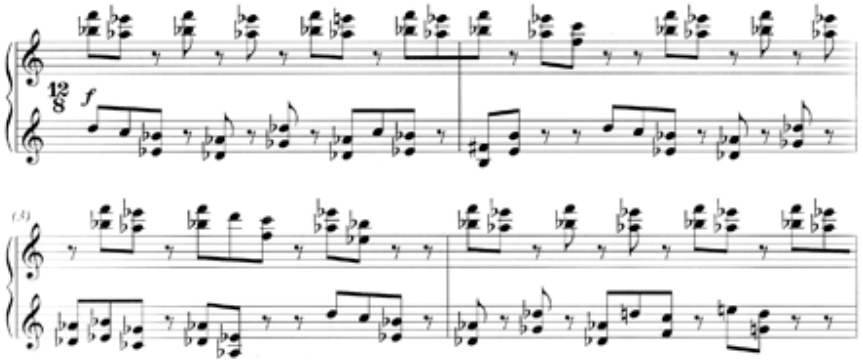


Example 4.15. Ligeti Piano Étude No. 12, mm. 10-12

Influence of African Music

Ligeti composed Étude No. 8 in 1989. Its title *Fém* means "metal" in Hungarian. This work represents several influences from African music including pulsation, cycles, time-line patterns, and interlocking.

African music often uses different timing systems that traditional western styles. In many cases there is a strict sense of metronomic pulsation, which serves as a foundation for the music. In Étude No. 8, the eighth note is the prominent rhythmic pulsation even though Ligeti delineates the time signature as 12/8. According to Ligeti's performance notes, the bar lines are only to help with synchronization.



Example 4.16. Ligeti Piano Étude No. 8, mm. 1-4

Another characteristic that Ligeti incorporates from African music is musical form. African music often consists of recurring patterns called strophes or cycles. A strophe or cycle may be divided in more than one way, known as a time-line pattern. Time-line patterns usually build the rhythmic ostinato with asymmetrical inner structure. The following Example 4.17 shows some of the most common time–line patterns where "x" represents the stroke.

The 12-pulse seven-stroke pattern

x o x o x x o x o x o x Or x o x o x o x x o x o x

The 12-pulse five-stroke pattern

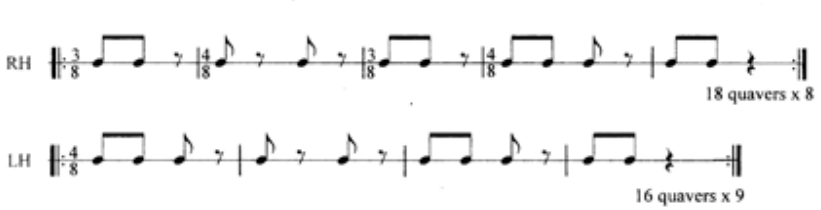
x o x o x o o x o x o o

The 16-pulse time line pattern

x o x o x o x x o x o x o x x o

Example 4.17. Common Types of the Time Line Pattern[103]

Like these patterns, Étude No. 8 *Fém* bears two different patterns that repeat throughout the piece. The right hand creates an 18-pulse, 11-stroke pattern while the left hand produces a 16-pulse, 10-stroke pattern (Example 4.18). Because of their different durations, the polyrhythm occurs when these two patterns are performed together.

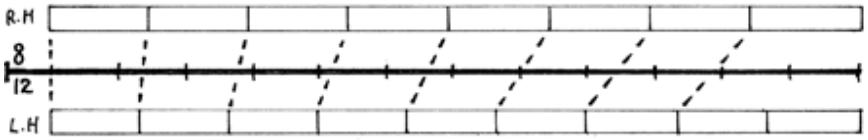


Example 4.18. Rhythmic Pattern of Ligeti Piano Étude No. 8 [104]

[103] In Encyclopædia Britannica. http://www.britannica.com/EBchecked/topic/719112/African-music/57085 (accessed October 30, 2008).

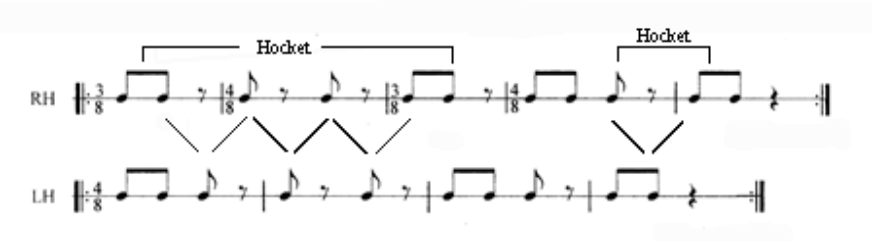
[104] Steinitz, *Music of the Imagination*, 301.

These two patterns form a regular cycle that repeats every twelve measures. This twelve-measure cycle creates a deviation because of the different durations of the two patterns. When the right hand pattern is repeated eight times and the left hand nine times in the twelve-measure cycle, the music becomes more chaotic because the hands begin to lose their synchrony. After this cycle is repeated three times, both of the rhythmic patterns expand and develop.



Example 4.19. Cycle of Ligeti Piano Étude No. 8

Another characteristic mentioned by Simha Arom is the interlocking technique or hocket polyphony, which occurs when one pulse falls exactly in the middle of the other pulse. This technique is commonly used for instrumental music in east and southeastern Africa. Each player is assigned one of the notes on the pentatonic scale in this style of music.[105] Therefore, melody is obtained only from the combination of parts. The Example shows the interlocking technique in the basic pattern of Étude No. 8.

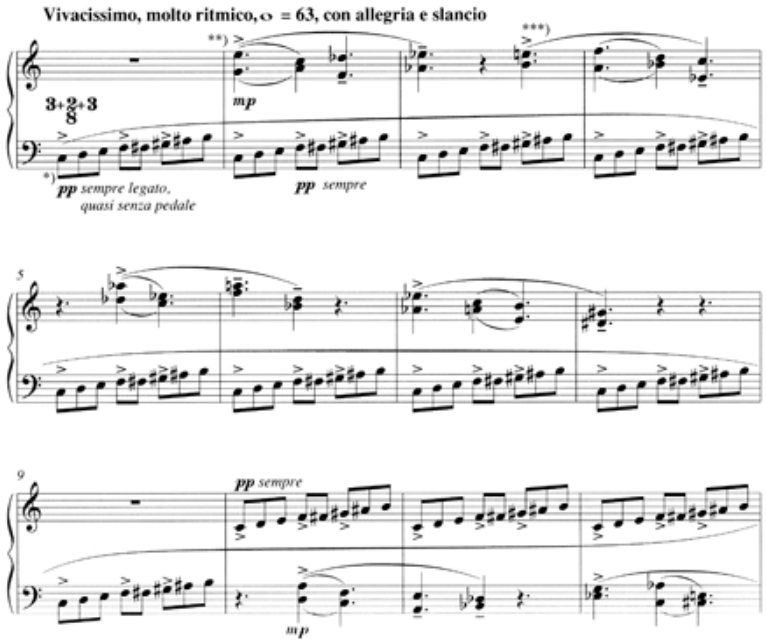


Example 4.20. Interlocking Technique in Ligeti Piano Étude No. 8

[105]Ibid., 216.

The Interlocking technique can be found in the music of amadinda and embaire xylophones (see Example 3.6 in Chapter 3). Example 4.16 shows that both hands share the beat and use the D-flat major pentatonic scale.

In Ligeti's Piano Étude No. 4 *Fanfares*, he used Aksak rhythm patterns to create polyrhythm. The term Aksak comes from the Turkish language which means "limping" or "stumbling", and is used to replace the term "Bulgarian rhythm."[106] As mentioned before in Chapter 3, this rhythmic pattern is characterized by combinations of 2+3 or 3+2. This is contrary to the majority of western traditional music which uses equal divisions of the beat (e.g. 4/4 = 2+2+2+2 eighth notes). The most common types of Aksak rhythms, 3+3+2 and 2+3+3, create a feeling of rhythmic instability. Bartók often used this rhythm in his piano music. For example, this Bulgarian rhythm appears in six dances from his *Mikrokosmos* volume VI.

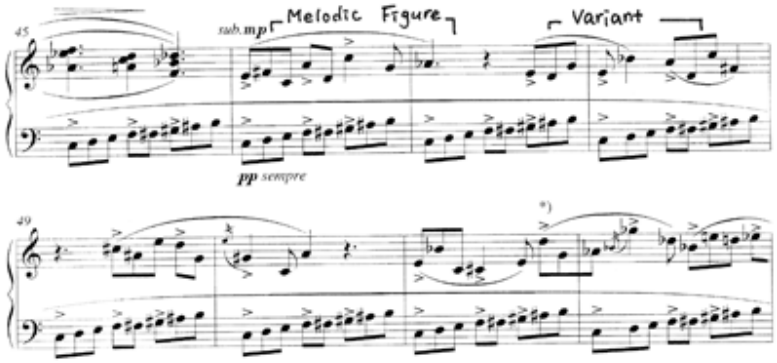


Example 4.21. Ligeti Piano Étude No. 4, mm. 1-12

[106] Simha Arom, "The Aksak rhythm: Structural aspect versus cultural dimensions" (paper presented at the 9th International Conference on Music Perception and Cognition, Bologna, Italy, August 22-26, 2006).

In Ligeti's *Fanfare*, an Aksak rhythmic pattern 3+2+3 serves as an ostinato throughout the entire piece.[107] The pattern features two ascending tetrachords (C, D, E, F, and F#, G#, A#, B. see Example 5.5). These tetrachords overlap to create two tritone intervals (C-F#, F-B). In the beginning, a four-phrase motif of homophonic melody occurs in the right hand, which contains three different Aksak rhythmic patterns. The left hand takes over this melody pattern after four phrases. This melodic figure is based around a chord progression and always uses an Aksak rhythm. Example 4.21 represents the ostinato and the four-phrase motif in the melody.

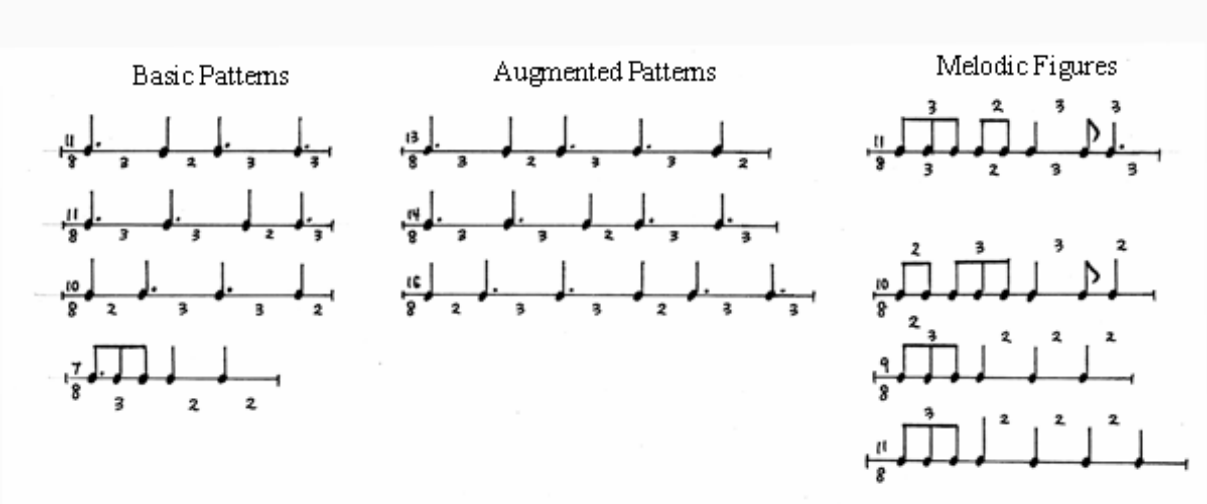
The asymmetrical Aksak pattern in the melody changes the rhythmic pattern in the middle section successively, while the ostinato pattern is not changed. Therefore, polyrhythm is created between the melody and ostinato pattern.



Example 4.22. Ligeti Piano Étude No. 4, mm. 45-52

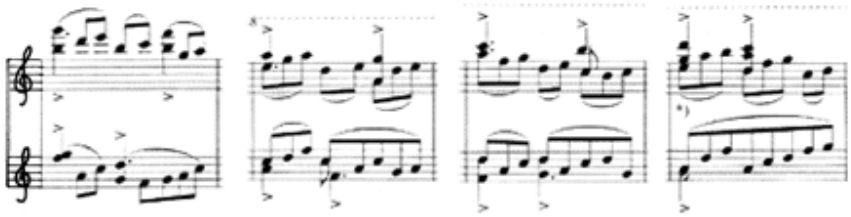
In this middle section, the homophonic style of the melody changes to melodic. Moreover, the four-phrase motif of the melody consists of major triads or minor triads in the beginning and this motif toward the end becomes more dissonant harmonically. The following illustrations indicate the variant Aksak rhythmic patterns in this Étude.

[107] Steinitz, *Music of the Imagination*, 288.



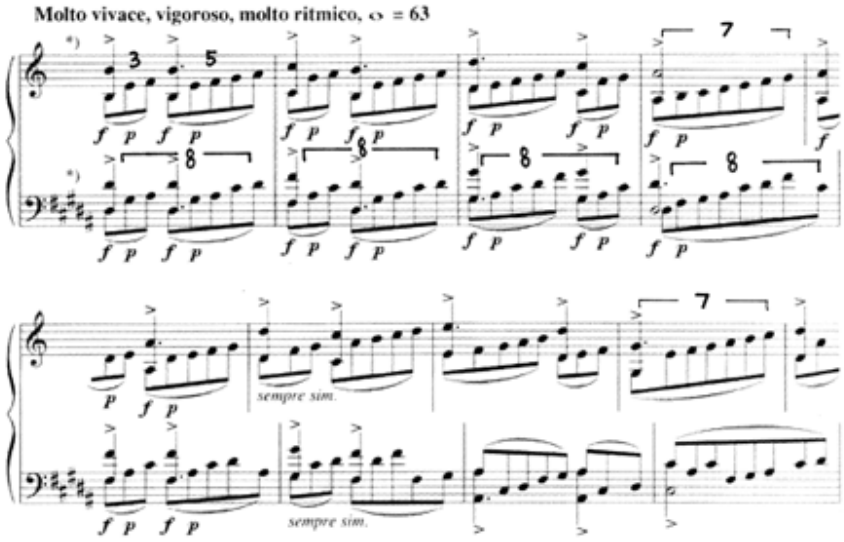
Example 4.23. Rhythmic patterns of Ligeti Piano Étude No. 4

The Piano Étude No. 1, *Désordre,* represents this well. Ligeti uses an African repeated rhythmic pattern in the beginning of this Étude. This pattern is seen in octaves for both hands and has a rhythmic pattern of three and five eighth notes. This 3:5 rhythmic pattern largely covers the whole piece as in No. 4 *Fanfares*. Also, some polyrhythms are created by changes in the rhythmic groupings of the right hand while the left hand keeps the original pattern. This is the same technique used in Étude No. 1.



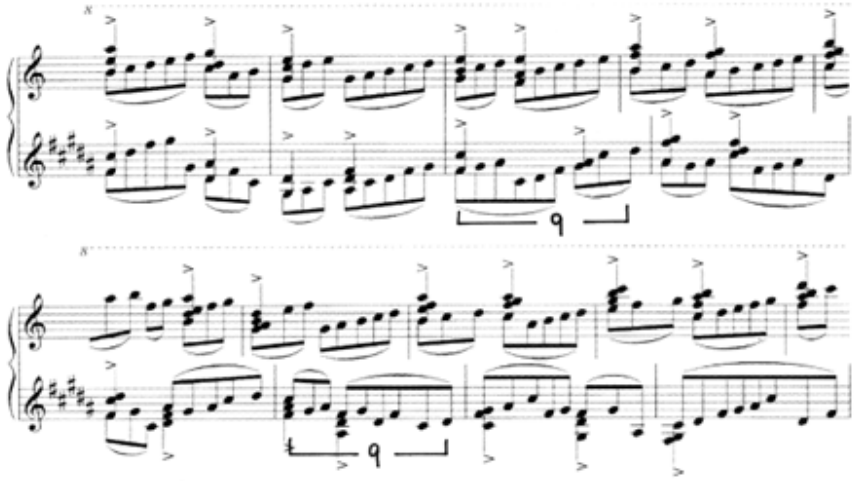
Example 4.24. Ligeti Piano Étude No. 1, mm. 1, 7, 11, and 14 of the sixth page

However, the Étude No. 1 also represents Nancarrow's style for developing polyrhythms. From measure 4, the right hand reduces one eighth note for every four measures, creating a measure of 7/8. Thus, the right hand moves progressively ahead of the left hand.[108] Both hands break out of synchrony and bar lines are scattered, resulting in a polyrhythm. The last section of this piece shows the same method in reverse. Ligeti added one eighth note in the left hand to make a 9/8 while the right hand keeps an 8/8. Because of these two polytemporal relationships between the hands, a polyrhythm is created as in the beginning section (see Examples 4.25 and 4.26).



Example 4.25. Ligeti Piano Étude No. 1, mm.1-8

[108] Steinitz, *Music of the Imagination*, 282.



Example 4.26. Ligeti Piano Étude No.1, mm.1-8 of the last page

Conclusion

This Chapter was categorized into two different polyrhythmic usages of Ligeti's Piano Études. The first usage, which emphasizes polytemporal relationships between the voices, is influenced by Nancarrow. The second usage can be found in African Music, which provides repeated rhythmic ostinato patterns. As mentioned before, it is difficult to determine clearly which Études belong to which method because Ligeti often combined these ways as well as other inspirations such as fractal theory and gamelan music.

From the point of this Chapter, Ligeti considered more polytemporal relationships in the Piano Études Nos. 2, 5, 6, 7, 11, and 12, while Nos. 1, 3, 4, 8, and 13 emphasize more repeated rhythmic patterns. In the future, the études which are not related on the polyrhythm (No.9, 10 and 14) and Piano Étude Book 3 (No.15, 16, 17 and 18) might be studied. In particular Ligeti pursued different concepts of composition in the Piano Études Book 3. As Richard Steinitz mentioned, unbroken rhythmic lines, a gently inflected modality, less dramatic emotion than

previous Études, and usage of white keys in Ligeti's Étude Book 3 can be further research material.[109]

[109] Ibid., 312-313.

CHAPTER 5
TECHNICAL PROBLEMS AND PRACTICE SUGGESTIONS

Ligeti's Piano Études require big technical challenges to any performer. From a pianist's point of view, two reasons of the technical challenge can be pointed out. First, Ligeti was not a virtuoso pianist himself. He comments that the initial impetus of his Piano Études was his own inadequate piano technique.[110] In spite of this he tried to achieve his imaginative music throughout the Piano Études,[111] and explained how he composed this music:

> I lay my ten fingers on the keyboard and imagine music. My fingers copy this mental image as I press the keys …. The anatomical reality of my hands and the configuration of the piano keyboard have transformed my imaginary constructs.[112]

As a result, Ligeti usually gave consideration to the sound he imagined more than to the physical convenience for the performer. Second, Ligeti often used unusual musical markings and techniques in order to provide a rich source of acoustic pleasure in his music. He employed African music and Gamelan sounds in his Piano Études through the use of fast repeated patterns, extreme registers, and polyrhythms among asymmetrically grouped patterns. In this chapter, technical problems and practice suggestions will be addressed.

Reading

One reason for the difficulty of Ligeti's Piano Études is lack of familiarity with the score elements. In non-tonal music, a pianist must adjust to the sound because there are no familiar chords and harmonies as in tonal compositions. A performer must be persistent in order to maintain the musical direction in the early stages of practice. The following examples show the difficulties in reading Ligeti's Piano Études.

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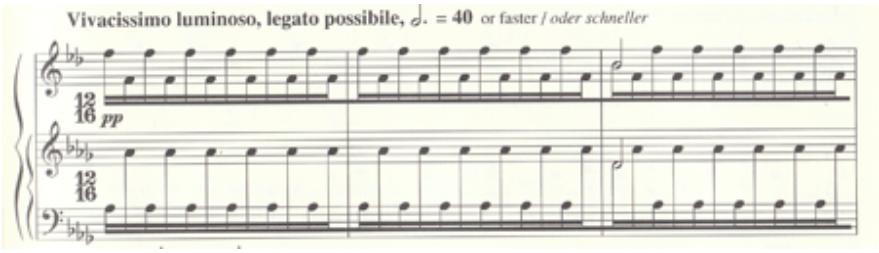
[110] Liner notes to Volume 3, Sony Classical SK 62308, 1997.

[111] Ibid.

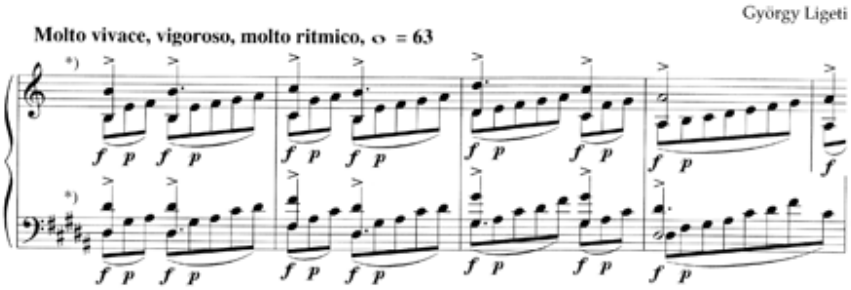
[112] Ibid.

On occasion, Ligeti used different key signatures for the two hands. In Étude No. 7, he used two whole tone scales in order to imitate the sound of gamelan tuning systems. While the right hand plays a whole tone scale starting on D-flat, the left hand begins on G-flat.



Example 5.1. Ligeti Piano Étude No. 7, mm. 1-3

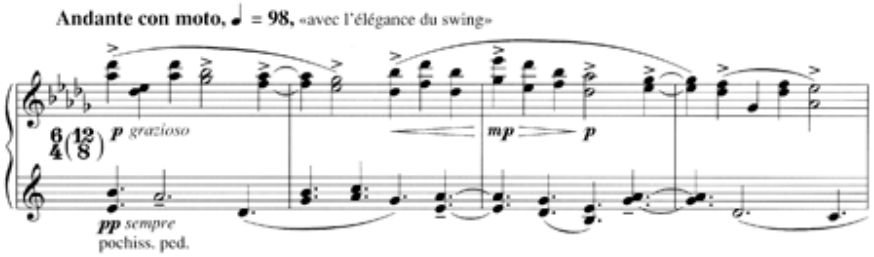
Ligeti used a similar method in his Étude No.1 *Désordre* which uses traditional key signatures, unlike the peculiar key signature he incorporates into Étude No. 7. In No. 1 Étude, each hand presents two different key signatures of C major and B major.



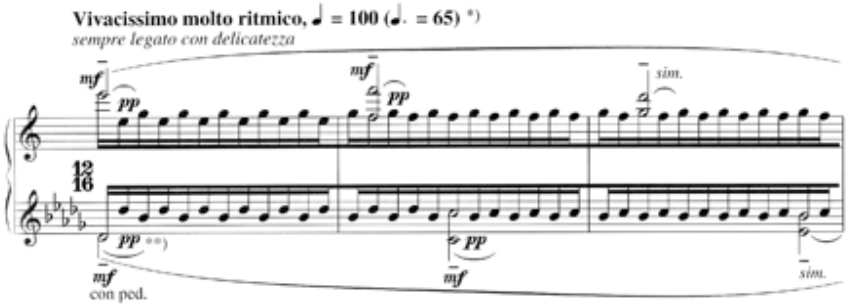
Example 5.2. Ligeti Piano Étude No. 1, mm. 1-4

Étude No. 11 and 12 present C major and D flat major key signatures in each hand. They also contain polytempi between both hands even though both hands use the same time signatures. In Étude No. 11 two different basic note values are found. The right hand is in 6/4, and the left hand in 12/8 which can be divided into four of the dotted quarter notes (see Example

5.3). Similarly, Étude No. 12 is a veiled 13/16 in the right hand and 17/16 in the left hand (see Example 5.4).



Example 5.3. Ligeti Piano Étude No. 11, mm. 1-4



Example 5.4. Ligeti Piano Étude No. 12, mm. 1-3

From a performer's point of view, careful reading is necessary in order to interpret the two nontraditional key signatures simultaneously. A pianist must adjust to this new concept of key signatures. In tonal music, an arrangement of sharps or flats at the beginning of each staff defines a diatonic scale that can be major or minor.[113] For example, an E-flat in the key signature automatically implies the presence of a B-flat in tonal music. However, both key

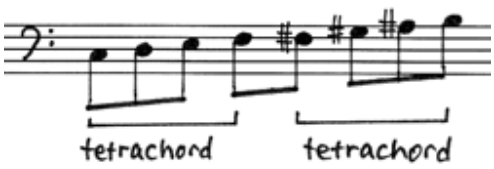
[113] *The Harvard Concise Dictionary of Music and Musicians*, 1999, edited by Don Michael Randel, s.v. "Key Signature."

signatures in Étude No. 7 (see Example 5.1) represent the whole tone scale. In order to avoid misreading, each voice needs to be practiced separately and slowly from the early stage of practice. Finger markings and reminders of accidentals will also assist in accurate reading; and listening to a recording is highly suggested to make sure of correct sounds.

Fast tempo, Perpetual Pattern and Accentuation

In general, Ligeti's Piano Études require proficiency from the pianist in these three technical categories: fast tempi, perpetual patterns and accentuations. These three challenges almost always happen simultaneously. The most important solution is physical relaxation. The following examples suggest how to deal with these problems.

The accents that coincide with the Aksak pattern in Étude No. 4 create technical difficulties for the pianist. As one can see in Example 5.5, the accent marks match the Aksak pattern of 3:2:3, instead of following the two tetrachords. Moreover Ligeti suggested that this ostinato to be played "*sempre legato, quasi senza pedale*" which translates "smoothly without pedal." It is challenging for a pianist to play this perpetual ostinato using precise accents, as well as avoiding physical tiredness throughout the entire playing time.

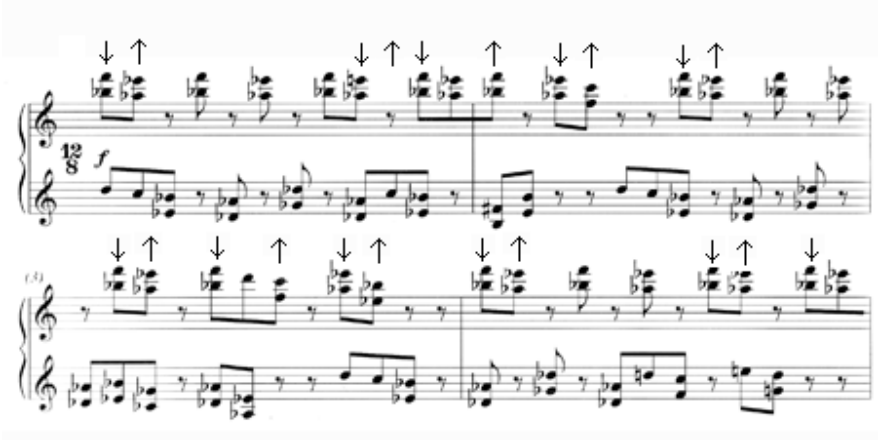


Example 5.5. Ostinato Pattern of Ligeti Piano Étude No. 4

Use of an appropriate fingering may be the solution for this matter. The suggested fingering for the ostinato is 5-4-3-1-4-3-2-1 or 5-3-2-1-4-3-2-1 (L.H.). Since the fifth and the first fingers can convey accents easily with arm weight, these fingerings help to produce the accent that corresponds to the Aksak rhythm. The fourth note, played by the first finger, should be emphasized more than the others because it is the most obvious representation of the Aksak pattern. In order to get rid of the physical tiredness, a quick rotating arm movement will enable

the wrist to move free of tension, especially when the fifth finger attacks the first note. A fingering of 4-3-2-1-4-3-2-1 may be used; however it does not coincide with the Aksak rhythm and instead follows the pulse of the two tetrachords. Thus, the fingering 4-3-2-1-4-3-2-1 is not recommended.

As Étude No. 8's original title "Quintes" indicates, the main idea of the piece is based on the interval of a fifth. Ligeti continuously alters notes between diminished, perfect, and augmented fifths. These changes in interval sizes as well as the tempo marking *vivace resolute, con vigore* create technical difficulties for the pianist. Generally, performing the same pattern continuously at a fast tempo can produce severe fatigue in a pianist's body and may cause a wrist injury. Therefore, a pianist should be careful to relax the wrists and arms when performing this piece. One way to ease the tension is to use a down-up motion in the wrist. A slight downward arm motion will create a sense of accent, while the rising motion creates a lighter sense. However, the wrist down-up motion should be minimal since this Étude requires a very fast tempo. The example below represents the down-up motion for relaxing the wrist.

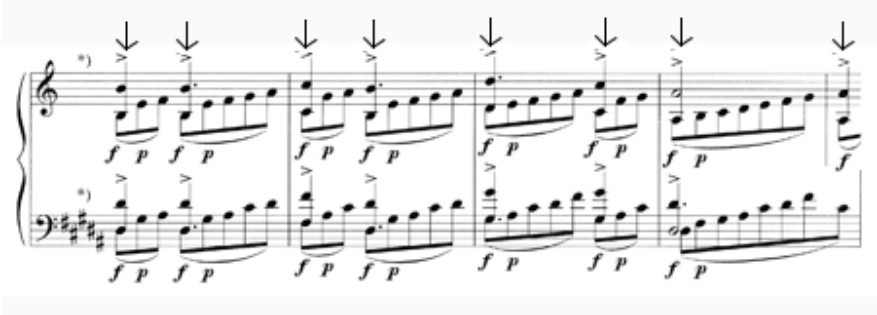


Example 5.6. Down-up motion of Ligeti Piano Étude No. 8, mm. 1-2

In addition, this relaxation technique helps the fingers to stretch with ease. In the middle section, a complex fingering is required to play the rapid fifth intervals in both hands. Therefore a pianist often has to stretch the distance between fingers. For example, a fingering combination

of 1-3 or 2-4 requires a relaxed wrist in order to prevent the muscles from locking on the fifths.

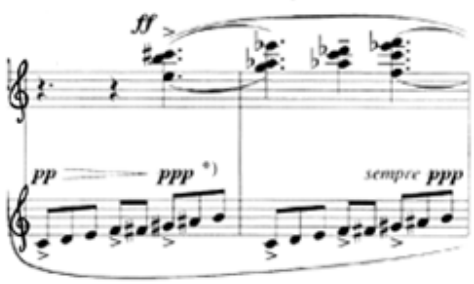
The same technique can be applied to the Piano Étude No. 1 *Désordre*. In the opening section, the octave melodic line has accents which create a 3:5 rhythmic pattern. A down-up motion that coincides with the accents will help to relax the body and increase the tempo.



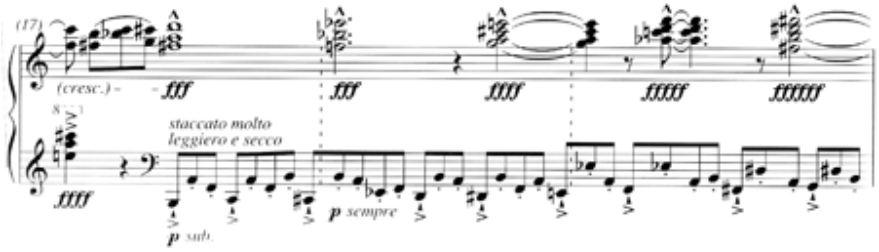
Example 5.7. Ligeti Piano Étude No. 1, mm. 1-4

Dynamics

Ligeti often used extreme dynamic marks, which may be impossible to express on the piano. The following examples show the difficulty resulting from the extreme dynamics.

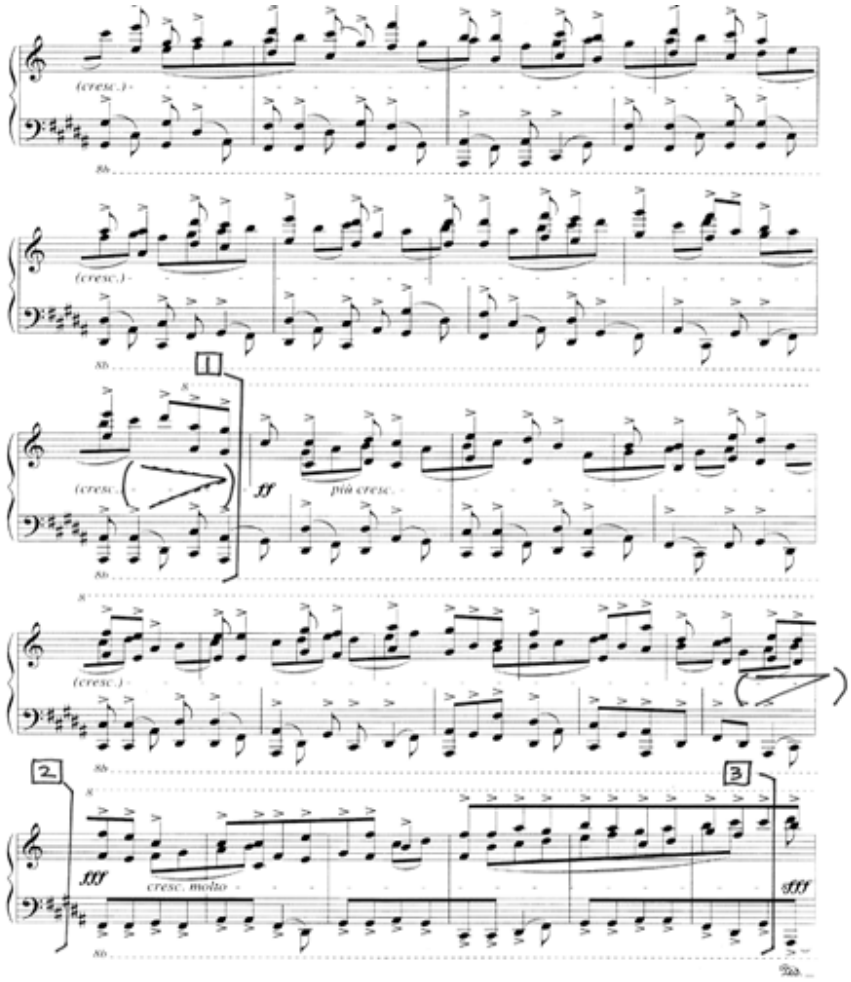


Example 5.8. Ligeti Piano Étude No. 4, mm. 63-64



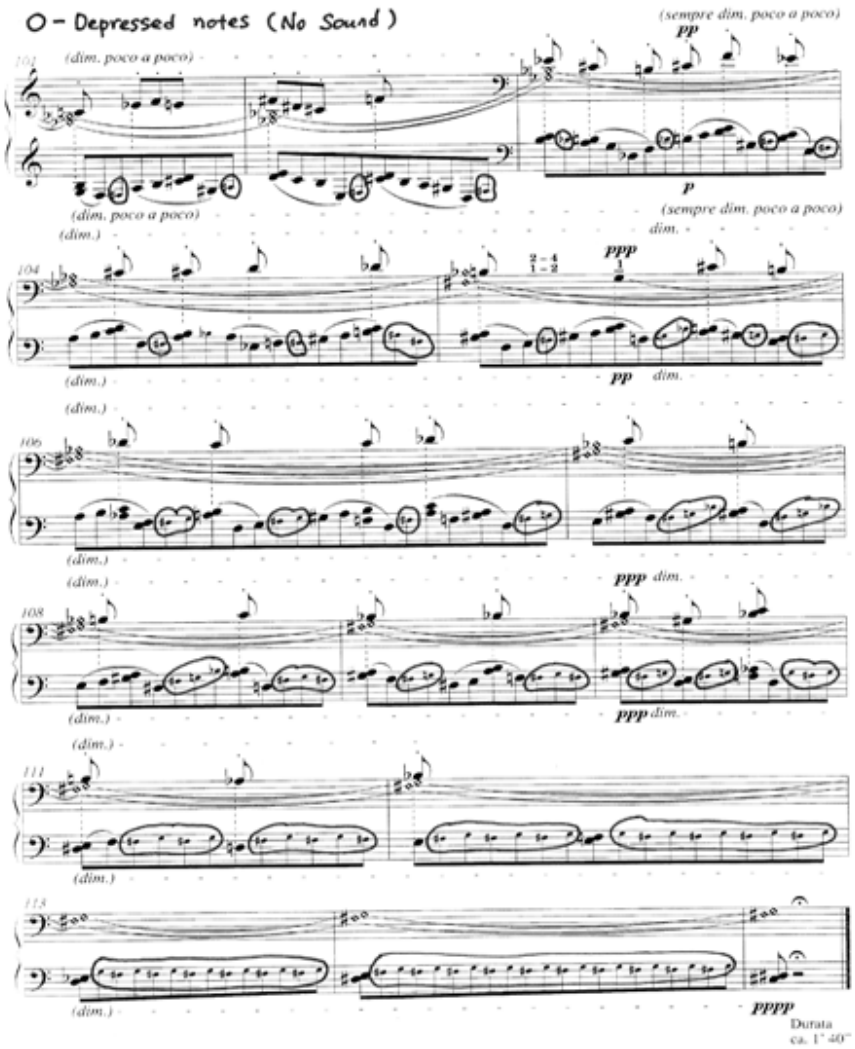
Example 5.9. Ligeti Piano Étude No. 13, m. 17

In addition, a pianist should study carefully the crescendos and diminuendos, which may last for a long period of time. In the middle section of Étude No. 1, Ligeti spent an entire page for a crescendo from forte to sfortisissimo (*sfff*). In Example 5.10, the crescendo is building up gradually throughout the cross accentuations until the climax (#3). For this crescendo, a performer may choose to divide the section into three parts. In Example 5.10, the page has been divided by dynamics (*ff, fff* and *sfff*). By reducing the sound slightly at the end of each section and rebuilding the crescendo, this long crescendo may be heard more effectively. Furthermore a pianist avoids overpowering the sound by separating each section in his/her mind. The pianist should also use more arm weight for playing accents as the piece gets louder.



Example 5.10. Ligeti Piano Étude No. 1, the Fifth Page

As to extremely soft sounds, one may be challenged in Étude No. 3. However, the section shown here naturally gets the effect of decreasing the sound because Ligeti adds more "silent" or depressed keys (see Example 5.11).

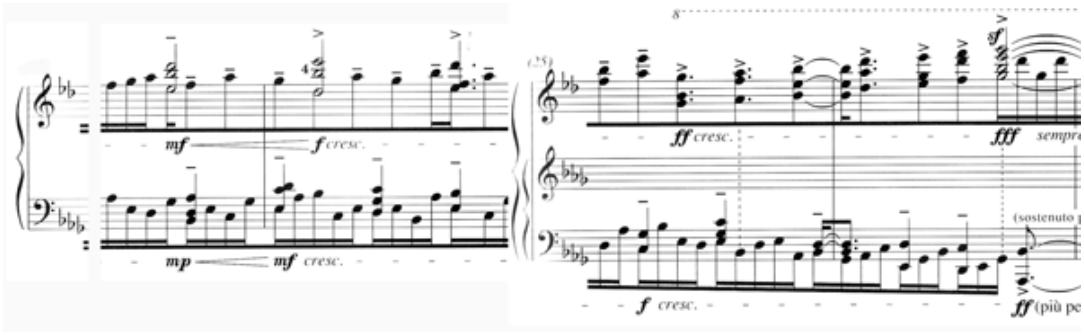


Example 5.11. Ligeti Piano Étude No. 3, mm. 101-115

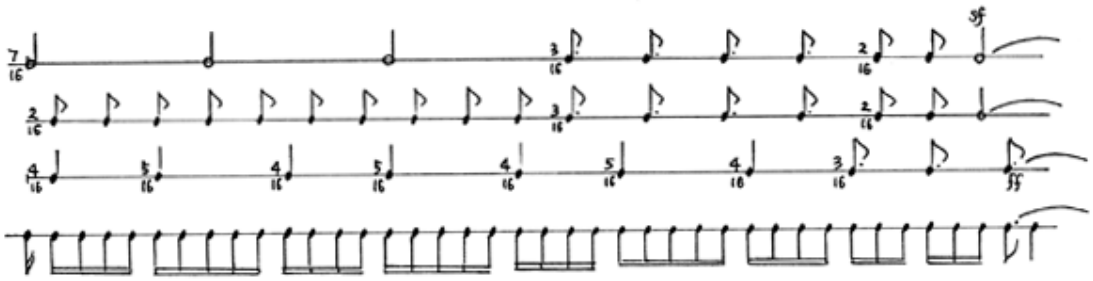
Polyrhythmic Sections

Polyrhythmic sections are always technically challenging for a performer since the two hands should play more than two voices. Moreover, Ligeti often put notated accentuations in these complicated portions. Therefore, it is important for the pianist to clearly articulate these

accentuations and to understand the correct rhythm for each voice. The following example represents a complicated polyrhythm.



Example 5.12. Ligeti Piano Étude No. 7, mm. 23-26



Example 5.13. Polyrhythm in Ligeti Piano Étude No. 7, mm. 23-26

This section of Ligeti's *Galamb Borong* features a climax in which three core melodies competing with each other reach a fortississimo in measure 26. Therefore, musical direction is given to the performer through dynamics and accentuations in this complicated section. It is important for the pianist to clearly articulate these sounds and to understand the correct rhythm for each voice. First of all, practicing this portion with a slow tempo is strongly suggested. When one practices this section hands separately, each voice should follow the same steady

sixteenth note pulse. One should also try playing different combinations of the voices in order to further understand the complex polyrhythm. In measure 25, alternating accents and tenuto markings between the right and left hands act as a stimulus to the dynamics and rhythmic speed.

Conclusion

Generally speaking, each performer might have different technical problems and solutions depending on his/her technical capability and physical condition. In this chapter, generally expected problems and solutions were commented and suggested.

From a wide point of view, physical relaxation is the most important technique to get rid of fatigue while playing the Ligeti Piano Études. Moreover, a performer should avoid physical injuries during practice. A performer should limit his/her time for each technical practice session because extended repetition of the physical movements can cause injury.

APPENDIX A

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APPENDIX B

LIST OF PIANO WORKS BY GYÖRGY LIGETI

1939-40	Kis zongorádarabok (Little piano pieces)
1942	Tréfás induló (Funny march), for piano four hands
1943	Kis tréfa (Little joke) Polifon gyakorlat (Polyphonic study), for piano four hands
1947	Capriccio No. 1 Capriccio No. 2
1948	Invention
1950	Négy lakodalmi tánc (Four wedding dances), for three female voices and piano, reworked as Három lakodalmi tánc (Three wedding dances), for piano four hands Sonatina, for piano four hands
1951-53	Music ricercata
1956	Chromatische Phantasie
1961	Trois Bagatelles
1976	Monument-Selbstportrait-Bewegung: Three Pieces for Two Pianos
1985	Études for Piano, Book 1
1985-88	Piano Concerto
1988-94	Études for Piano, Book 2
1996-2001	Études for Piano, Book 3

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BIOGRAPHICAL SKETCH

Ji Won Baik was born in Seoul, Korea, and started playing the piano at the age of six. She graduated from Sun Hwa Art middle and high school. After receiving an undergraduate degree from Hanyang University in Korea, she entered The Ohio State University to pursue her Master of Music degree in Piano Performance, which she completed in 2001. She received the Doctor of Music Degree in Piano Performance from the Florida State University in 2009.

At The Ohio State University Ji Won Baik won the OSU Concerto Competition as well as the OMTA (Ohio Music Teachers Association) Music Competition. During her doctoral studies at Florida State University she served as a teaching instructor for piano and piano pedagogy areas. In 2006 she participated in the first Global Scarlatti Marathon, in which all 556 Scarlatti sonatas were performed in a single day in seven different countries. She also studied fortepiano, harpsichord, and organ music.

She studied with Won-Sook Hur, Mee-Kyung Yoon, Elena Shshiko, Caroline Hong, Karyl Louwenaar, and James Nalley.