

# The role of dexterity in Ligeti's Piano Etudes, Trio and Concerto

[Redacted version]

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&  
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## ABSTRACT

The main objective of my artistic research is to examine the role of dexterity in György Ligeti's piano music; particularly the ways in which he develops the concept of pianism in his *Etudes, Piano Trio, and Piano Concerto*. Although key lines of inquiry have already been widely examined in Ligeti's piano works concerning matters of rhythmic complexity, erratic metre, accentuation, and notation (e.g., Boukobza, 2019; Talgam, 2019; Steinitz, 2003) the previous research has neglected a thorough analysis of dexterity: 'music written for the hand.'

My methodology involves a detailed analysis of and reflection on the fundamental principles of the keyboard technique which shaped and influenced Ligeti's work. I focus on the fundamental aspects of keyboard fingering through three core approaches: engagement with the wider historical tradition (e.g., CPE Bach, Frederic Chopin's documented practice and other sources), consideration of Ligeti's manuscript, and lastly my own experience playing Ligeti's late period works.

Through the investigation, I argue that despite the extreme complexity and uniqueness of the composer's works considered, they demonstrate a continuity with both the pianistic hand and pianistic history.

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# 1 INTRODUCTION

In this chapter I will start by addressing the impact of my encounter with Ligeti's work, and then look at his life and compositional influences. For reference, this commentary is informed by four professional projects, which were examined through the live performance and the links can be found below.

- Artistic Project 1, 'Ligeti Piano Etudes Book 1 and the Horn Trio:'  
[https://www.youtube.com/live/Ja01UZi\\_rQ0?si=sgUH-0cJiO4y-cld](https://www.youtube.com/live/Ja01UZi_rQ0?si=sgUH-0cJiO4y-cld)
- Artistic Project 2, 'Ligeti Piano Etudes Book 2 and 3:'  
<https://www.youtube.com/live/bkx8AUvwgJI?si=7W3vL7chcnPRa0As>
- Development Project, 'Katrin Klose Piano Concert:'  
<https://youtu.be/2e0Y9tJralA?si=sniCD6PoEXwNVaDe>
- Artistic Project 3, Ligeti Piano Concerto

[The fourth and final link to Artistic Project 3, 'Ligeti Piano Concerto' has been redacted owing to relevant permissions not being granted].

The series of professional projects conclude with Artistic Project 3, 'Ligeti Piano Concerto' held 26 January 2024. This section is followed by a summary of Ligeti's experience with the piano and his piano works of his early and late periods. The chapter will conclude with the aims and objectives of my research based on the literature that has been critically explored.

## 1.1 MY ENCOUNTER WITH LIGETI'S PIANO WORKS

Working on Ligeti's Piano Etude No. 1 *Désordre* as a young student in my early twenties was a turning point in my understanding of polyrhythms, the musical impact of a piece and pianism. Ligeti aimed to achieve the illusion of different tempi, the illusion of order and disorder. For a pianist, the tempo of rhythmic units of different lengths is the same, but the listener experiences the illusion of different tempi (see Example 2). It was a completely new experience for me to realise the possibility of producing different simultaneous tempi in both hands. Studying this Etude was my first encounter with such complex polyrhythms, when polyphonic layers result in great rhythmic complexity. A striking feature, which would become an important characteristic of Ligeti's Etudes, is the lack of a bar-oriented metre. The bar lines serve only as guidelines, and the fact that the metre is divided asymmetrically creates constant chaotic yet organised polyrhythmic tension between the hands. Indeed, I could not imagine at that time that the process of exploring Ligeti's Etudes would grow addictive, and one of my musical aspirations would be to perform Ligeti's technically demanding yet poetic cycle of 18 Piano Etudes. My discoveries and my fascination did not end with complex polyrhythms and the Etudes' dramatic impact.

When studying Ligeti's Etude No. 1 in-depth, I was struck by the fact that these etudes are of paramount importance in their contribution to pianistic values, such as pianistic fingering and dexterity. The idea of exploring the fundamental aspects of keyboard fingering in Ligeti's works struck me even more when I saw that almost no fingering was provided in the scores by Ligeti himself. Ligeti's first and main point for writing for any instrument was the physical sense of the instrument. In an interview around his violin concerto, Ligeti said:

When I had the first ideas for my *Piano Etudes* or for the *Piano Concerto*, the physical impression of the piano keys under my fingers became a part of my musical conception. If I imagine a melody or a figure, I must physically sense the instrument, and this was missing with the violin. Before I began to compose the *Violin Concerto* I had, as always, very intensively studied the technology and the literature of the instrument. My models were Paganini, Ysaÿe's *Solo Sonatas* [for violin, Op. 27], Wieniawski and Szymanowski. However, this did not replace the missing conception of feeling the strings under my fingers. I never played the violin and was never in the position to feel it. For me to write for the violin was like speaking Japanese! (Duchesneau, 1995).

Although there is a lack of fingering and pianistic indications in his piano works, the feeling of the keys under the fingers is the main driving concept behind the advanced pianistic writing of his late period. It seemed to me that these works were written very naturally for the hand, despite their rhythmic complexity. As a pianist, I realised that this concept was essential to an understanding and performance of his music and is something worthy of further investigation.

## 1.2 LIGETI: LIFE AND COMPOSITIONAL INFLUENCES FOR HIS PIANO WORKS

‘There is no doubt that the stance of the artist, his whole approach to his art, his means of expression, are all greatly influenced by experiences he has accumulated in the course of day-to day living’ (Ligeti quoted in Steinitz, 2003, p. 3).

György Sándor Ligeti (1923–2006) is regarded as one of the most innovative, influential, and distinctive composers of the 20th century. He was born on the 28<sup>th</sup> of May 1923 in the small town of Dicsöszentmárton, a Hungarian enclave which became Romanian Transylvania in 1920 by the Treaty of Trianon. The biography of Ligeti is already extensively described in Richard Steinitz's book (Steinitz, 2003), which will serve as an important reference to many of my reflections present in this thesis. Key components of Ligeti's work, including polyrhythms, *aksak* patterns, the influence of Bartók, chaos theory, fractals, the interconnecting networks of melodic layers, the *Lamento* motif, and ethnic music—Balinese, Caribbean, and Central African polyphony—have all been widely addressed in prior study. Due to the specific focus of my research, this thesis concentrates on the most impactful influences on Ligeti’s piano works, specifically Conlon Nancarrow and Frédéric Chopin.



### 1.3 LIGETI AT THE PIANO

Ligeti began his first piano lessons in 1937, at the age of 14. Although he was too old to develop a virtuoso piano technique (Steinitz, 2003), Ligeti performed in public some of his early compositions, such as the Little Piano Trio, which became a part of his entrance examination at the Kolozsvár Conservatory. This conservatory in Romania became his school and he studied there with Ferenc Farkas<sup>1</sup> between 1941 and 1943. Other piano works performed by Ligeti were the Hindemith *Piano Sonata* No. 2 for his piano examination at the Franz Liszt Academy (Steinitz, 2003) and his composition of *Three Weöres Songs* for which he accompanied soprano Edit Gáncs in Budapest, in 1948.

In 1945, towards the end of the war and the National Socialist Regime, Ligeti took a calculated risk to cross the Romanian-Hungarian border in order to study at the Franz Liszt Academy in Budapest. There, he studied composition with Sándor Veress<sup>2</sup> (who had studied piano with Bartók), again with Ferenc Farkas and completed his studies with Pál Járdanyi. Ligeti's assignments frequently included piano compositions, as Veress believed this to be the best way to practise sonata forms, inventions, and fugues. Such exercises- imitations of Bach, Handel, Beethoven, and Schumann, are prevalent in Ligeti's sketchbooks from 1945 onwards. From 1950-1956, with the support of Zoltán Kodály<sup>3</sup>, Ligeti held the position as a teacher of theory, harmony, and counterpoint at the Franz Liszt Academy (Steinitz, 2003). Following

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<sup>1</sup> Ferenc Farkas (1905–2000) was a Hungarian composer. He served as a composition professor at Budapest's Franz Liszt Music Academy from 1949 to 1975.

<sup>2</sup> Sándor Veress (1907–1992) was a Swiss composer of Hungarian origin who studied and taught at the Franz Liszt Academy in Budapest. After spending the first half of his life in Hungary, Veress relocated to Switzerland from 1949 where he became a citizen in the final months of his life.

<sup>3</sup> Zoltán Kodály (1882–1967) was a Hungarian composer, ethnomusicologist, music educator, linguist, and philosopher. He is globally recognised as the founder of the Kodály method of music education.

his escape to Western Europe he was offered teaching positions from four conservatoires: Berlin, Hamburg, Cologne, and Vienna. Eventually, Ligeti taught composition at the Hamburg Music *Hochschule* from 1973–1989 (Steinitz, 2003).

Steinitz highlighted that, in the late 1970s, Ligeti adopted the practice of playing through classical and romantic chamber music with his students from the *Hochschule*. These musical gatherings were at his apartment, and he utilised his ‘competent but far from professional ability’ (Steinitz, 2013, p. 251). At the piano, Ligeti read through solo piano works by Bach, Schumann, Liszt, Rachmaninov, and Debussy, but never publicly, even in his seminar, and he ‘never learnt anything up to performance, merely sight-reading’ (Steinitz, 2003, p. 251).

Professor Martin Bresnick, of Yale University School of Music, studied composition with Ligeti from 1972, where the latter was composer in residence at Stanford University. In December 2023 (via email), Professor Bresnick informed me that in the course of his long-term teacher-student relationship with Ligeti, the composer never played the piano within a lesson. Professor Bresnick also added that, when writing his Etudes, Ligeti travelled with the scores of Scriabin, Debussy, Schumann, Chopin, and other masters but he never played that repertoire professionally or publicly. Ligeti frequently explained to Bresnick that he began his piano studies too late in his development to become any more than a ‘provisionally competent pianist,’ but that he enjoyed listening to the recordings of performers he admired. For instance, he once gave Bresnick a recording of the Bach *Art of Fugue* (a work he loved) by the Russian pianist Evgeni Koroliov, but he never played that music himself in Bresnick’s presence. Bresnick also added that ‘one would certainly wish to learn how Ligeti, no more than a modest player, was able to compose the most significant piano music of the late twentieth century. It is a mystery that lies at the very heart of his amazing, uniquely

imaginative musical mind’ (personal email communication, 3<sup>rd</sup> December 2023).

The tables below show the list of Ligeti’s piano pieces, excluding the lost works. As illustrated, Ligeti’s compositions can be divided into two categories: early works written in Hungary and Romania, and late works written in Western Europe. The aim of these tables is to show the development of his piano writing over the course of his career.

1939–1941	<i>Kis zongorádarabok</i> (‘Little Piano Piece’) (partially unpublished)
1940	<i>Kis Canon Egy roman karácsonyi dalra</i> (‘Small Canon for a Romanian Christmas Song’) (unpublished)
1941	<i>Invention</i> (unpublished)
1941	<i>Four short piano pieces</i> (unpublished)
1941–1942	<i>Kis zongoratrió</i> (‘Little Piano Trio’) for violin, cello (or viola) and piano (unpublished)
1942	<i>Tréfás induló</i> (‘Funny March’) for piano four hands
1942	<i>Nocturne</i> (unpublished)
1942	<i>Induló</i> for piano four hands
1943	<i>Polifon etüd</i> (‘Polyphonic Study’), for piano four hands
1943	<i>Egy Kis tréfa</i> (‘Little joke’) (unpublished)
1947	<i>Dans</i> (unpublished)
1947	<i>Capriccio</i> No. 1,

	<i>Capriccio No.2</i>
1947–1948	<i>Cigáni tánc</i> (unpublished)
1948	<i>Invention</i>
1948	<i>Dansuri</i> ('Dances') (unpublished)
1948	<i>El kéne indulni</i> (unpublished)
1950	<i>Sonatine</i> for piano four hands
1950	<i>Allegro</i> for piano four hands (unpublished)
1950	<i>Három lakodalmi tánc</i> ('Three wedding dances') for piano four hands
1951–1953	<i>Musica Ricercata</i>
1956	<i>Chromatische Phantasie</i> (unpublished)

Table 1: Ligeti's Piano works written in Romania and Hungary, in chronological order.

1961	<i>Trois Bagatelles</i>
1976	<i>Monument.Selbstportrait. Bewegung: Three Pieces for Two Pianos</i> (‘Monument. Self Portrait. Movement.’)
1982	<i>Trio for Violin, Horn, and Piano</i>
1985	<i>Etudes for piano, Book 1</i> Etude No. 1 <i>Désordre</i> ('Disorder') (Originally called <i>Pulsation</i> ) Etude No. 2 <i>Cordes à vide</i> ('Open Strings') Etude No. 3 <i>Touches bloquées</i> ('Blocked Keys') Etude No. 4 <i>Fanfares</i>

	<p>Etude No. 5 <i>Arc-en-ciel</i> ('Rainbow')</p> <p>Etude No. 6 <i>Automne à Varsovie</i> ('Autumn in Warsaw')</p>
1985–1988	<i>Piano Concerto</i>
1988–1994	<p>Etudes for piano, Book 2</p> <p>Etude No. 7 <i>Galamb borong</i></p> <p>Etude No. 8 <i>Fém</i> ('Metal') (Originally called <i>Quintes</i>)</p> <p>Etude No. 9 <i>Vertige</i> ('Dizziness')</p> <p>Etude No. 10 <i>Der Zauberlehrling</i> ('The Apprentice Magician') (Originally called <i>Staccato</i>)</p> <p>Etude No. 11 <i>En Suspens</i> ('In Suspense') (Originally called <i>L'arrache-Coeur</i>, 'Heart-snatcher')</p> <p>Etude No. 12 <i>Entrelacs</i> ('Interlacing')</p> <p>Etude No. 13 <i>L'escalier du diable</i> ('The Devil's Staircase')</p> <p>Etude No. 14 <i>Columna infinita</i> ('The Infinite Column')</p> <p>Also published No. 14A <i>Columna infinita</i> for player piano</p>
1995–2001	<p>Etudes for piano, Book 3</p> <p>Etude No. 15 <i>White on White</i></p> <p>Etude No. 16 <i>Pour Irina</i> ('For Irina')</p>

	<p>Etude No. 17 <i>A bout de souffle</i> ('Out of Breath')</p> <p>Etude No. 18 <i>Canon</i> (Originally called <i>Casse doigt</i>, 'Finger-breaker')</p>
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Table 2: Ligeti's piano works written in Western Europe, in chronological order.

As can be seen from these two tables, Ligeti wrote almost no piano music between 1956 and 1976. The only exception is *Trois Bagatelles*, which is based on silence similar to Cage's *4:33*. We do not know why Ligeti avoided the piano for so long, but we can speculate two reasons:

1. his use of micropolyphony in composing (a complex, web-like texture of polyphonic layers that is not possible to realise on the keyboard),
2. the shift to a less traditional compositional approach.

Both of these, we can assume, required some rethinking of how to write for the keyboard. It is worth highlighting two keyboard works that Ligeti composed in this period: *Volumina* for organ (1962, revised in 1966–1967), which does focus on the cluster style of the orchestral music (Steinitz, 2003) and *Continuum* for Harpsichord (1968), which develops the *meccanico* pattern style that is present in *Monument-Selbstportrait-Bewegung* for two pianos (Steinitz, 2003). The Ligeti Collection at the Paul Sacher Foundation holds works from across Ligeti's life. Several piano pieces were unpublished and are only available for viewing at the Sacher Foundation. Among the published early works is *Musica Ricercata*, one of the most innovative works written in the middle of the twentieth century. It consists of eleven pieces and is based on certain pitch classes. The important feature of each piece is that each movement has

one more pitch class than the previous one. Understanding Ligeti's perspective on the composition is useful:

In 1950, I began to experiment with very simple structures of sonorities and rhythms as if to build up a new kind of music starting from nothing. I set myself such problems as: what can I do with a single note? With its octave? With an interval? With two intervals? What can I do with specific rhythmic interrelationships which could serve as the basic elements in a formation of rhythms and intervals? Several small pieces resulted, mostly for piano (quoted in Steinitz, 2003, p. 54).

Ligeti demonstrated an innovative writing approach in No. 7 of *Musica Ricercata*, creating no rhythmic connection between the hands. The left hand plays a group of seven notes at 88 tempo mark, and the right hand plays a singing melody at 116 metronome crotchet beat in  $\frac{3}{4}$  metre. This approach of rhythmic disconnection would later become of essential in some of the Etudes and the Piano Concerto. The degree of musical and technical difficulties in Ligeti's piano compositions between those written in Hungary and those written in Western Europe differs significantly. In his earlier piano works, Ligeti was still searching for his distinctive approach to piano writing. This would take a dramatic turn in his late period works, after a 20-year hiatus. Friedemann Sallis has noted that, the difficulties of Ligeti's earlier works, in certain aspects, were comparable to those of in Bartók's *Mikrokosmos*, with the difference that Ligeti's works did not have a pedagogical purpose (Sallis, 1996). Those challenges are related to the rhythmic and metric organisation, and the polyphonic texture with two or more independent rhythmic layers as in No. 7 and No. 10 in *Musica Ricercata*, similar to *Mikrokosmos* Nos. 125, 126, and 146. Other difficulties are associated with articulation, dynamic gradations, and textural balance. Ligeti's attitude towards his early works were 'light, capricious and, at times, insolent' (Sallis, 1996, p. 103), which faded in his late compositional style.

Ligeti's first piano work after leaving Hungary was *Monument-Selbstportrait-Bewegung: Three Pieces for Two Pianos*, written in 1976. This piece hints at Ligeti's innovative theory of rhythmic articulation, which would eventually be at the core of his Etudes.

I developed the idea of illusionary rhythm further in Monument for two pianos where both pianists play similar musical phrases, but one in duple and the other in triple meter. This, however, understood as an 'Ivesian' heterogenous layering for, on the contrary, it is the homogenous fusion of the sound of the pianos which is of utmost importance. The complexity of the resulting contorted polyphony is thus achieved by superimposing two relatively simple phrases.... While I was writing these pieces for two pianos in 1976, I was unaware of Nancarrow's music and that of Sub-Saharan Africa. However, I have always had an interest in picture-puzzles, paradoxes of perception and ideas, for certain aspects of the shaping and building of form, of growth and transformation and for the distinction between various levels of abstraction in thought and language (Ligeti, 1988, p. 3).



Figure 1: Ligeti at the piano



Ligeti's apartment at Mövenstrasse, Hamburg. November 9, 1989

(Gellrich and Heister, 2008).



Figure 2: Ligeti at the piano

Ligeti's apartment at Mövenstrasse, Hamburg. November 9, 1989

(Gellrich and Heister, 2008).

## 1.4 THE TRIO, PIANO CONCERTO AND PIANO ETUDES

This section encompasses a brief description of the Trio, Piano Concerto, and Piano Etudes. I have drawn on Steinitz's book (2003) as well as my own experience performing these works.

### **Trio for Violin, Horn, and Piano**

After Ligeti completed his opera *Le Grand Macabre* in 1977, he stopped composing for over four years. He was looking for a new direction in his compositional style (Steinitz, 2003). The commission of the Horn Trio in 1983, to mark the 150<sup>th</sup> anniversary of Brahms's birth in 1833, opened a new phase in Ligeti's creative career. The trio, a piece of distinctive character and artistic maturity consists of four movements. The first movement has a ternary ABA form, a notable look back towards traditional forms. The opening theme is reminiscent of that of Beethoven's Piano Sonata No. 26, *Les Adieux* (Steinitz, 2003). The second movement is an inventive scherzo, dominated by a lopsided 3+3+2 rhythm influenced by what Ligeti referred to as 'Caribbean-Bulgarian' rhythms. The third movement is an energetic *Alla Marcia*. The horn falls silent, while the violin responds to the piano one semiquaver late. In the trio section, all three instruments join in a poetic and delicate waltz. The final movement can be described as one of the most dramatic and tragic pieces in Ligeti's late music featuring a lachrymose, half-tone descending *lamento* motif. At the end of the piece, the violin and horn are at the extremes of their ranges and an echo of the piano, sounding like the trace of a feeling that once burned bright.

## **Concerto for Piano**

The Piano Concerto is a significant work for piano and orchestra. Mario di Bonaventura to whom the Concerto is dedicated, conducted the first three movements in Graz in 1986 with his brother, pianist Anthony di Bonaventura at the piano, along with the Vienna Philharmonic. The complete work, including the fourth and fifth movements, was performed in Vienna in 1988, also by the Bonaventura brothers with the Austrian Radio Symphony Orchestra.

In its complete shape, the Concerto is an extraordinary work that features a sheer athleticism in an effortless manner. While the piano part is extremely challenging, there is very little conflict between the orchestra and the soloist. Instead, every instrument plays a solo role within the complex polyrhythmic structure. *The lamento motif* is essential to the Concerto's melodic presentation. The second and third movements are based on a singing-like expression that imitates breathing at the end of a phrase (see bars 32–40 and bars 7–14, respectively).

Although both the Horn Trio and Concerto will be referenced as necessary, this thesis concentrates on the Etudes owing to the primary focus of the study.

## **The Piano Etudes**

Ligeti's Piano Etudes are undoubtedly some of the most innovative and technically demanding compositions of the twentieth century. The Etudes mark the beginning of new discoveries and possibilities for the piano while reconnecting with its history and traditional repertoire. Ligeti's sketches of the Etudes reveal the composer's strong connection with

Chopin. These sketches include mention of some of the Chopin Etudes and other works, such as Polonaise Fantasy, which can be seen at the Paul Sacher Foundation in Basel. Ligeti composed a cycle of 18 Etudes between 1985 and 2001, which preoccupy the late period of the composer's life.

## 1.5 THE INFLUENCE OF CONLON NANCARROW

The influence of American composer, Conlon Nancarrow (1912–1997) and his use of a player piano was significant in Ligeti's Piano Etudes. What Nancarrow achieved with a player piano in terms of superimposing different units of polyphonic layers, Ligeti developed for a human pianist by employing one performer to execute simultaneously units of three-four-five or seven-note groupings, creating the illusion of different tempi. For example, in Etudes Nos. 1 and 6, which are based on a fast but steady pulsation, the foreground pulsation becomes background, allowing the listener to focus on different polyrhythmic layers and units. Different units exist not only between the hands but also in one hand. The pianist counts strictly and plays the same speed, but the listener gets the illusion of different tempi.

As Ligeti (1988) described in the article 'On my Etudes for piano':

Nancarrow's marvellous music for mechanical piano gave me the impulse to consider looking for ways and means by which living interpreters could perform such complex music. Further, I asked myself whether one could possibly entrust a single soloist with such complex polyrhythms (p. 4).

Some of Ligeti's Etudes also exist in mechanical piano versions. Jürgen Hocker, who transcribed Nancarrow's Etudes, also, transcribed some of Ligeti's Etudes for player piano, in agreement with the composer. This includes Etude Nos. 9 and 14.

## 1.6 THE INFLUENCE OF CHOPIN WITH REGARD TO POLYRHYTHMS

With respect to polyrhythms, Chopin had a tremendous impact on Ligeti. Chopin's use of dazzling polyrhythms is an intriguing aspect of his music that many listeners may not notice. Douglas R. Hofstadter, the author of *Gödel, Escher, Bach: An Eternal Golden Braid*, (1986), whose books were among Ligeti's favourites (Ligeti, 1988), presented some graphic illustration of Chopin's Etudes and their visual effects in *Metamagical Themas*, a collection of articles. One chapter titled 'Pattern, Poetry, and Power in the Music of Frédéric Chopin' is dedicated to Chopin's Piano Etudes. This chapter helped me to observe certain key components in Chopin's complex polyrhythmic patterns, and some textural similarities that Ligeti used in his Etudes. As Hofstadter (1986) states:

.... the phenomena perceived to be magical are always the outcome of complex patterns of nonmagical activities taking place at a level below perception. More succinctly: The magic behind magic is pattern (p. 174).

Chopin's *Ballade* in F minor, which shares several parallels with Ligeti's Etude No. 6, *Automne à Varsovie*, stands as one of the most intricate examples of polyrhythm in Chopin's music. Example 1 is taken from Hofstadter's *Metamagical Themas*. In brief, the pattern in the right hand consists of eighteen semiquavers divided into six groups of three (the black notes). As well as this middle-voice accompaniment, the right hand also contains the melody in the upper voice (red notes), played on every fourth semiquaver. The left hand features two groups of six notes (in blue), which, combined with the rhythmic groupings of the right hand, create a three-against-two polyrhythm. The red melodic notes create a third rhythmic line on top of these.

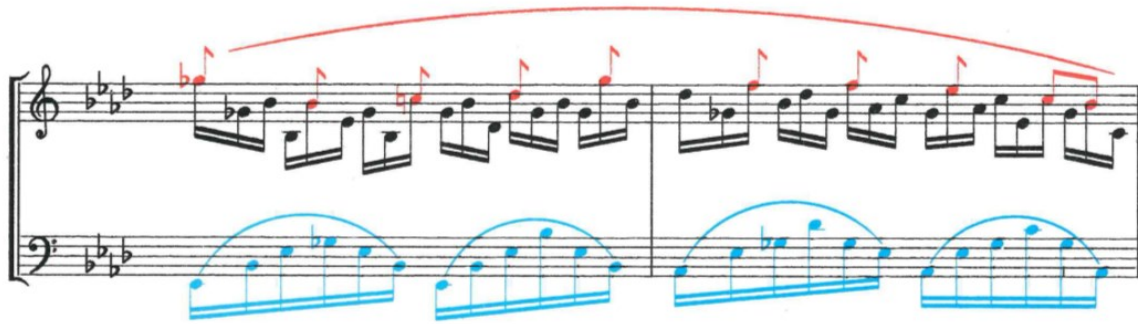


FIGURE 9-8. One of the most complex examples of polyrhythm in all of Chopin's output. These two measures from his F-minor Ballade involve 3-against-2 (on a local scale) as well as 3-against-8 (on a more global scale, involving the notes with flags flying upwards). [Music printed by Donald Byrd's SMUT program at Indiana University.]

### Example 1: Chopin, Ballade in F minor.

Although Chopin is traditionally acknowledged for his melodic gift, closer study reveals his skill with complex rhythmic structure. To illustrate similarities between the work of Chopin and Ligeti, I have highlighted bars from Ligeti Etude No. 6, *Automne à Varsovie*, depicting the polyrhythmic layers. Each line has different group of notes. For instance, in bar 43, the top line (in pink) consists of five notes, while the middle line (in yellow) consists of groups of three. In bar 44, a new layer (in orange) has seven notes, followed by another layer (in blue) from the second half of bar 45, initially comprising three notes then changing to four. These polyphonic lines continue to expand throughout the entire Etude, making it one of the most rhythmically and metrically complex compositions. Similar to Ligeti's Etude No. 1, it maintains a rapid, yet constant pulse. As the music progresses, the listener focuses on the various polyrhythmic layers and units created not only between the hands but also within each hand, as illustrated in Example 2. Despite the pianist adhering to exact counting and performing at a consistent speed, the listener perceives different tempi.

Example 2: Ligeti, Etude. No. 6 bars 43–48.

Hofstadter presents two versions of the opening of Chopin’s Etude Op. 25. No. 2. The first version features Chopin’s original composition with both hands considered in threes creating a polyrhythmic effect. However, Hofstadter also presents a second version, which he misheard, and which loses the polyrhythmic effect across the hands.



The image displays two systems of musical notation for Chopin's Etude Op. 25, No. 2. Each system consists of a treble clef staff and a bass clef staff. The tempo is marked 'PRESTO' and the dynamics are 'p' (piano) and 'molto legato'. The music features a complex melodic line in the right hand and a supporting bass line in the left hand, both containing numerous triplets.

Example 3: Chopin, Etude Op. 25, No. 2. (Hofstadter, 1986)

Hofstadter's works played an important role in shaping Ligeti's melodic thinking, a concept that would later be incorporated into his late period works (Steinitz, 2003).

The pianism of composers like Chopin is therefore crucial for understanding Ligeti's work.

This thesis seeks to contribute to the literature by analysing this overlooked component of his compositions.

## 1.7 RESEARCH AIMS AND OBJECTIVES

My research aims and objectives are as follows:

- To analyse the pianistic style and aesthetics of Ligeti's works, synergising Ligeti's piano works to the longer historical keyboard heritage from the pianistic perspective.
- To show what insights the Etudes, Trio, and Concerto offer pianists in fingering and dexterity—a factor not addressed in previous research to the best of my knowledge. Dexterity is an embodied knowledge of many pianistic characteristics, such as pianistic skills for fingering and flexibility of the hand, which demonstrates how the Etudes draw on that knowledge.
- To demonstrate how performers can achieve comfortable and secure fingerings in Ligeti's works by combining my experience with the historical legacy and Ligeti's approach to pianism. This can be achieved through the fingerings that are best suited for the process of exertion-recovery, as well as those that are most appropriate for flexibility in the wrist, hand, and fingers.

## 2 METHODOLOGY

The Trio, Concerto and Piano Etudes represent a new phase in Ligeti's music presenting challenges in terms of polyrhythms and musical difficulties. Based on my own experience with those works, the Etudes exhibit a natural feel for pianism, and offer a unique perspective from a pianistic point of view. Ligeti's return to piano music later in his life holds enormous significance, as he seemed to find a way to match his aesthetics to the piano and became more comfortable with the instrument. In my artistic research, I will explore the pianistic challenges of Ligeti's work in terms of finger dexterity and how he develops expressive pianism through fingering.

Ligeti never explicitly wrote about fingering, and the previous research on his work has primarily focused on his use of rhythmic complexity (Boukobza, 2019; Talgam, 2019; Pace, 2012; Steinitz, 2003; Ligeti, 1988), which presents specific challenges in relation to fingering. However, this topic has not yet been the subject of academic research, except for one dissertation. Among the dissertations held at the Paul Sacher Foundation is a thesis by Yung-Jen Chen (2007); on *Analysis and Performance Aspects of György Ligeti's Etudes Pour Piano: Fanfares and Arc-en-ciel*, which briefly reviews fingering in the left hand of *Fanfare*. The author discusses two fingering possibilities for the left-hand ostinato passage, which impacts the rhythmic aspect of the accented notes. Even Steinitz's monumental work on Ligeti's life provides only a small amount of information on Ligeti's own approach to pianism. In the absence of more information, the present doctorate aims to demonstrate a unique and significant understanding of his conception of pianism and seeks to address the gap in current literature and practice by entwining three key approaches (detailed below) to inform the analysis.

1. Historical tradition: most importantly, Carl Philip Emanuel Bach's writings, Chopin's documented practice, and other sources, which collectively define the historical tradition of my artistic research.
2. Evidence from Ligeti's Manuscript: The manuscripts of the Etudes are held at the Paul Sacher Foundation in Basel. Upon examination, I discovered that Ligeti had made some fingering indications not present in the Schott edition. While these hints are limited, they provide valuable support for my conclusion.
3. My own experience of playing Ligeti's works (the premise of the artistic projects); experimenting with different fingering patterns, analysing various features of fingering in the Etudes and commenting on factors that produce good or poor fingering. In making these experiments, I have used as a reference the work of Romanian pianist and musicologist Julien Musafia's *The Art of Fingering in Piano Playing*.

## 2.1 HISTORICAL TRADITION

In this section, I will introduce three key approaches as relevant historical sources of keyboard fingering which would have had an influence on Ligeti. Then, I will compare the early and modern fingering systems, followed by a section about the influence of Chopin on the modern keyboard fingering. The first approach is Carl Philip Emanuel Bach's *Essay* (1753) on *Versuch über die wahre Art das Clavier zu spielen* ('The True Art of Playing Keyboard Instruments').

Carl Philipp Emanuel Bach (1714–1788), commonly abbreviated CPE Bach, was the fifth child of Johann Sebastian Bach. Piano playing owes much to CPE Bach's innovations as he established a new method of piano fingering. The *Essay* is one of the most influential pedagogical works of the time, studied by Haydn, Mozart and Beethoven, and others, reaching a wide audience. CPE Bach wrote more than ninety fingering rules aiming to provide elasticity, suppleness, and natural extension for the hand. It influenced the contemporary piano teaching, particularly that of Chopin. My artistic research has been greatly influenced by the *Essay* which has a particular focus on fingering. In order to understand the differences between the early and modern fingering systems, it would be useful to examine the diagram below. The diagram, provided by Howard Ferguson, a prominent British composer, pianist, and musicologist, shows a series of examples of earlier techniques spanning from 1520 to 1720, illustrated in Figure 3.

Ex. 20 Early Fingerings of Diatonic Scale Passages ('good' fingers in bold type)

	L.H. ascending	L.H. descending	R.H. ascending	R.H. descending
Buchner, c. 1520		<b>2 3 2 3 2 3 2</b>	<b>2 3 2 3 2 3 4</b>	<b>4 3 2 3 2 3 2</b>
Ammerbach, 1571	<b>4 3 2 1 4 3 2</b>	<b>2 3 2 3 2 3 4</b>	<b>2 3 2 3 2 3 4</b>	<b>4 3 2 3 2 3 2</b>
Diruta, 1593	<b>4 3 2 3 2 3 2</b>	<b>2 3 2 3 2 3 4</b>	<b>2 3 4 3 4 3 4</b>	<b>4 3 2 3 2 3 2</b>
Cabezón, 1578	<b>4 3 2 1</b>	<b>1 2 3 4</b>	<b>3 4 3 4</b>	<b>3 2 3 2</b>
English Virginalists	<b>5 4 3 2 1 2 1</b>	<b>1 2 3 4 3 4 5</b>	<b>3 4 3 4 3 4 5</b>	<b>5 4 3 2 3 2 3</b>
Sweelinck	<b>5 4 3 2 1 2</b> <b>5 4 3 2 [3 2] 1</b>	<b>1 2 3 2 3 4</b> <b>1 2 3 4 5</b>	<b>2 3 4 3 4 5</b>	<b>{ 4 3 2 1 2 3 2</b> <b>{ 5 4 3 2 3 2 3</b>
Scheidemann	<b>{ 2 1 2 } [1] 2</b> <b>{ 4 3 2 }</b>		<b>3 4 3 4 3 4 5</b>	<b>5 4 3 2 3 2</b>
Purcell, 1696	<b>5 4 3 2 3 2 1</b>	<b>1 2 3 4 3 4 5</b>	<b>1 2 3 4 3 4 5</b>	<b>5 4 3 2 3 2 1</b>
J. S. Bach, 1720	<b>[5 4] 3 2 1 2 1</b>	<b>[1 2 1] 2 3 4 5</b>	<b>3 4 3 4 3 4 5</b>	<b>5 4 3 2 3 2 1</b>
Nivers, 1665	<b>4 3 2 1 2 1</b>	<b>{ 1 2 3 4 3 4</b> <b>{ 1 2 3 4 3 4 5</b>	<b>{ 2 3 4 3 4 3 4</b> <b>{ 1 2 3 4 3 4</b>	<b>{ 4 3 2 3 2 1</b> <b>{ 4 3 2 3 2 3 2</b>
F. Couperin, 1716	<b>5 4 3 2 [3 2] 1</b>	<b>{ 1 2 3 4 3 4</b> <b>{ 1 2 3 4 3 4 5</b>	<b>1 2 3 4 { 3 4</b> <b>{ 2 3</b>	<b>5 4 3 2 3 2 1</b> <b>5 4 3 2 3 2</b>

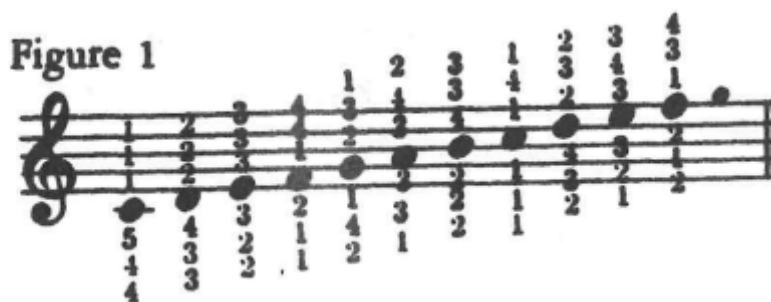
Early Fingering

Figure 3: Early Fingerings of Diatonic Scale Passages, Ferguson (1975).

It shows how much more frequently the middle three fingers were used than the thumb and fifth finger. The thumb was not frequently employed in the early fingering system as a pivot point, allowing the fingers to move up and down the scale. In order to enable lateral movement, the longer fingers, usually finger 3, would pass over to its neighbour finger. Early fingering systems for a right-hand scale (one octave) could be 34343434 (ascending) 32323232 (descending). For the left hand, the pattern is reversed: 32323232 (ascending) 34343434 (descending).

This stands in contrast to the modern fingering scale, where the pattern in the right hand is 12312345 (ascending) 54321321(descending). For the left hand, it is 54321321 (ascending) and 12312345 (descending) (Bach, 48). In CPE Bach's new fingering system, the turning of the thumb and crossing of the fingers plays an important role. The thumb was not only a pivoting finger to provide lateral movement for the hand, but also a principal means to extend the range of the passage, as five fingers can naturally play only five notes consecutively. This fingering technique became fundamental for establishing the scale fingering that is used

nowadays. Bach also specified that the thumb and fifth finger should avoid black keys except when a leap occurs. Other important characteristics of modern fingering were the turning under of the thumb in scales and arpeggiated passages. The thumb passing under the second, third, or fourth fingers, but never the fifth, and the thumb being used for passages in thirds. It also introduced the use of a silent change of fingers on the same note and sliding one finger legato from the black note to the white on an adjacent pair, something that was cultivated by Chopin. Other characteristics included in the *Essay* are the fingerings for double notes, three-note, and four-note chords in their broken and unbroken forms. Below is the modern fingering example of a C-major scale with three fingering possibilities for both hands. Here, the turning of the thumb is fundamental, allowing the fingers to move up and down with great flexibility. In the *Essay*, fingerings for each scale are described individually.



Example 4: Fingerings for C major scale (Bach, 1753).

To outline the progression of modern fingering, it is important to discuss Chopin's influence on modern piano fingering and its application in Ligeti's piano works.

The second part of the historical tradition concerns Chopin's documented practice. His suggested fingerings represent a distinct and pivotal phase in piano performance development. They strongly reflect his piano texture and are based on ideas of hand suppleness, relaxation, and calmness. Initially criticised and misunderstood, his original fingering style eventually became standard practice for many generations of pianists

worldwide (e.g. Ekier, J., Polish National Edition, 2019). Chopin's novelty in piano fingering includes using the thumb on black keys or passing it under the fifth finger. He frequently employed the same finger to play two adjacent notes consecutively, smoothly connecting them, whether transitioning between black and keys, or utilising the same finger for neighbouring white or black keys. Additionally, Chopin repeatedly crossed the longer fingers over one another, without employing the thumb. Through the musical examples, I will examine instances of Chopin's unique fingerings in his own works and how they shaped Ligeti's piano writing.



## 2.2 EVIDENCE FROM LIGETI'S MANUSCRIPT

Ligeti's own perspectives on pianism, had he been more explicit, would have provided the most pertinent information on this subject. Although there are some fingerings and other pianistic indications in the Ligeti Collection at the Paul Sacher Foundation not printed in the Schott edition of Ligeti's etudes, information from him on pianistic issues is scarce. The most beneficial information for us, the performers, may be this description about the nature of the piano and the pianistic hand by the composer:

I lay my ten fingers on the keyboard and imagine music. My fingers copy this mental image as I press the keys, but this copy is very inexact: feedback emerges between ideas and tactile/motor execution. This feedback loop repeats itself many times, enriched by provisional sketches: a mill wheel turns between my inner ear, my fingers and the marks on the paper. The result sounds completely different from my initial conceptions: the anatomical reality of my hands and the configuration of the piano keyboard have mined in my imagination; to some extent they also lie in the nature of the piano-I have to feel them out with my hand... A well-formed piano work produces physical pleasure (Ligeti quoted in Steinitz, 2003, p. 278).

We have no solid evidence that Ligeti read CPE Bach's *Essay*, but we can surmise that his teaching at the Liszt Academy would have been quite traditional, and the work's influence on piano pedagogy would have indirectly informed the way he was taught piano. Ligeti (1986) described the Franz Liszt Academy as 'the best music school in South-Eastern Europe, whose impressive tradition reached all the way back to Franz Liszt' (p. 3). From the establishment of the Academy, Liszt was responsible for teaching the highest level of piano playing. The Academy produced notable alumni such as Béla Bartók who became professor of piano in 1907 at the age of 26. Bartók studied piano with István Thomán who studied with Liszt and

followed Liszt's legacy in his teaching methods. Two other notable alumni of the Liszt Academy were Zoltán Kodály and András Schiff who studied with György Kurtág.

I will provide specific examples of Ligeti's thoughts on some pianistic fingering. As evidenced in his manuscripts, these examples will serve as an important direction for understanding Ligeti's views regarding the role of dexterity as presented in this thesis.

Ligeti's fingering examples are primarily associated with Etudes Nos. 1, 3, and 9.

## 2.3 MY OWN EXPERIENCE OF PLAYING LIGETI'S WORKS

As my primary approach, I draw upon my own experience and knowledge of Ligeti's repertoire, delving into the challenges within his work to show how certain patterns from Bach's fingering rules and Chopin's development of keyboard fingering are relevant to the specific passages in Ligeti's works.

CPE Bach outlined several fingering rules. Here, I am dealing with ones that, I think, are still relevant to Ligeti's music, written two hundred years later. Additionally, I aim to experiment with different fingering patterns and comment on the features that contribute to either good or poor fingering. I will prioritise the following points, derived from Musafia's 1971 work:

- Exertion-Recovery process
- Flexibility in wrist, hand, and fingers
- Smoothness of the line with legato touch
- Comfort and Efficiency

When striking a key, the finger muscles become actively engaged. In rapid passages, which are abundant in Ligeti's piano works, the fingers require recovery time in order to continue functioning efficiently. This aspect must be considered and organising specific fingering combinations can facilitate this process. I will demonstrate how the exertion-recovery process can be applied in some of Ligeti's works. Additionally, I will discuss fingerings that promote flexibility in the wrist, hand, and fingers. Overall, the musical examples analysed in this thesis will offer guidance to performers on how to arrange certain fingerings for a comfortable and efficient rendition of a piece.

I have marked certain bars with alternative fingerings. There will be several fingering possibilities discussed in my thesis and I will compare the musical results they produce. Poor fingering will cause awkwardness for the hand, and in contrast, good fingering will facilitate the execution of the most challenging passages.

I have taken CPE Bach and Chopin as models and applied their principles to different passages in the Etudes, Trio, and Concerto. In selecting which historical fingering rules to use for my research, I focused on those that are most relevant to the Etude, Trio and Concerto, prioritising good over poor fingering outcomes. The chosen rules contribute to realising skills written for the pianistic hand. Chopin described the process of studying piano as the art of playing the piano (Eigeldinger, 1986, p. 23), and his ideas addressing the technical aspect of the art aimed to enrich pianism. Speaking from a technical point of view, works suited for the pianistic hand are those created to enable natural and ergonomic hand movements, fostering dexterity, virtuosity, agility and evenness in the fingers, suppleness and flexibility of the wrist, and tranquillity in the hand. From CPE Bach's rules to Chopin's art of piano playing, the chosen rules come to a point where historical tradition and Ligeti's approach to pianism intersect. The Ligeti examples that I have chosen to analyse, in turn, are those that most closely resemble CPE Bach fingering rules and Chopin's practice. While the level of difficulty in Ligeti's late piano works is extremely high, the existing challenges stem from mastering simpler skills in pianistic issues. The pieces are written for the piano and not against it.

While fingering rules are essential for the learning process, the fingering choices ultimately depend on a pianist's individual approach. Factors such as hand shape, technique, and

comfort allow for greater flexibility, enabling pianists to tailor their preferences to suit their individual playing styles.

The fingering groups forming the focus of my analysis, derived from Bach's fingering rules will be discussed individually:

1. Omission of certain fingers from stepwise successions.
2. Adjacent tones, struck simultaneously, taken by adjacent fingers.
3. Fingering related to the passing of the thumb. The use of finger that preceded the thumb in order to maintain a single hand position and avoid the awkward shift caused by a normal, but in this case, rapid finger crossing.
4. Playing two adjacent notes with the same finger/successions of the same finger.
5. Finger substitutions on the same note.

From Chopin's documented practice, I will discuss the following fingering elements:

1. The use of the thumb and little finger on black keys and the passing of the thumb under the fifth finger on black keys.
2. Crossing longer fingers over one another.

Additionally, I will explore the role of double thumbing in historical practice and its application in Ligeti's piano writing. While this fingering technique was not mentioned in CPE Bach's Essay due to traces of old methods that eschewed the use of the thumb, it was widely employed in Chopin's music, and later in Ravel's *Scarbo*.

Most examples are sourced from the Schott edition of Ligeti's works. In cases where examples are obtained from other sources, this will be explicitly specified directly above the

examples. Alternative fingerings are labelled as (a), and (b), which should not be confused with the capital letters used for the pitch notation. For the latter, the letters C, D, E, F, G, A, and B will be employed.

### **3 STUDY OF FINGERING IN LIGETI'S PIANO WORKS**

#### **3.1 OMISSION OF FINGERS FROM THE STEPWISE SUCCESSION**

Omission of fingers from the stepwise succession is an essential fingering technique described by CPE Bach, providing expediency and efficiency in playing. This technique enables pianists to recover after finger exertion and maintain flexibility for upcoming notes. In Example 5, Bach examines various possibilities for finger omission. The first three lines exemplify a situation where finger omission is appropriate.

According to Bach, the line marked with double asterisks is not as effective as the one marked with a single asterisk. In the latter, there is a great deal of flexibility in the thumb which allows more effortless execution of the pattern. Furthermore, the more fingers are omitted, the easier the execution becomes, as demonstrated by Bach in the left hand of the final two bars in Example 5. In (1.), the second, third, and fourth fingers are omitted, providing more flexibility for the approaching A. In (2.), there is less finger flexibility as only two fingers, the third and the fourth, are omitted.

Figure 59



Example 5: Omission of fingers from the stepwise succession (Bach, 1753).

Etude No. 1 serves as the first example from Ligeti's work used here to analyse this technique. As it is typical for most ascending runs in this Etude, the second finger is omitted (see highlighted fingerings in Example 6).

The omission of the second finger and the use of the third finger enable the subsequent octave to be executed with ease and flexibility.



Molto vivace, Vigoroso, molto ritmico  $\text{♩} = 76$

Piano

*f* *f* 2 3 1 3 *f* 2 3 1 3 *f* 2 3 1 3 *f* *f* *f* 2 3 1 3 *f* sempre simile

*f* *f* *f* *f* *f* *f* *f* *f* *f* *f* *f* *f* *f* *f* *f* sempre legatissimo possibile sempre simile

*f* *f* *f* *f* *f* *f* *f* *f* *f* *f* *f* *f* *f* *f* *f* sempre simile

Stets sehr sparsamer Gebrauch des Pedals / Utiliser la pédale très discrètement (pendant toute la pièce)

The image displays a handwritten manuscript of the opening of Ligeti's Etude No. 1 for piano. The score is written on two systems. The first system consists of a grand staff with a piano part on the left and a right-hand part on the right. The tempo and character are marked as 'Molto vivace, Vigoroso, molto ritmico' with a quarter note equal to 76 beats. The music features a complex rhythmic pattern of eighth and sixteenth notes. Various performance instructions are written in italics, including 'sempre legatissimo possibile', 'sempre simile', and 'Stets sehr sparsamer Gebrauch des Pedals / Utiliser la pédale très discrètement (pendant toute la pièce)'. Fingering numbers like '2 3 1 3' are written above several notes in the right hand. The second system continues the musical notation with similar annotations and fingering.

Example 6: Ligeti, Etude No. 1, Facsimile Edition, the opening.

The following example is the manuscript of Etude No. 1 in which Ligeti marked some fingerings which are not present in the current Schott edition. In Example 7 below, Ligeti discusses fingering sequences. The first one concerns bars 4 and 8 in the right hand, where the same fingering pattern would be incorrect for both passages. The second one discusses ‘the first appearance of the 4<sup>th</sup> finger in the left hand - the pentatonic scale renders it otherwise unnecessary.’

2

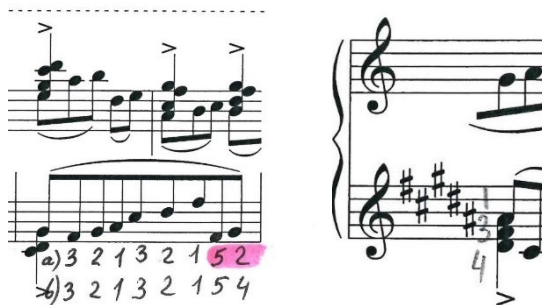
\* (Similar fingerings for these two passages would be fallacious.)  
 † (This is the first appearance of the 4th finger in the LH - The pentatonic scale renders it otherwise unnecessary.)

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 Unverfälschtes Manuskript  
 Nur für den geschützten Gebrauch  
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Example 7: Etude No. 1, György Ligeti Collection, Paul Sacher Foundation, Basel.

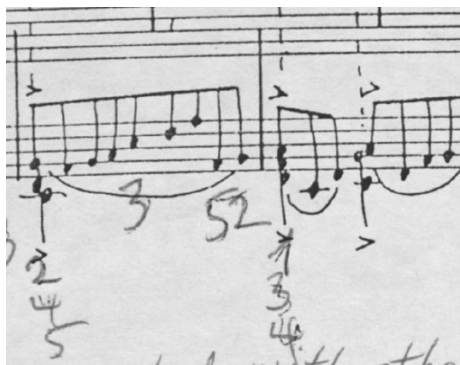
The manuscript example corresponds to the fourth system of page 7 in the Schott edition.

Example 8 below demonstrates two fingering possibilities in Etude No. 1, page 12, line 3. In (a), fingers 5–2, as highlighted, are employed on the last quavers, thus omitting fingers 3–4. However, in (b), there is no omission of fingers, and fingers 5–4 play in normal succession. Considering the approaching chord D sharp–F sharp–A sharp with fingers 4–3–1, it seems that the fingering in (a) is more suitable for this passage. The execution of finger 2 on G sharp, preceded by finger 5 on F sharp, helps release any tension after finger exertion and allows for recovery time before striking the chord. By contrast, in (b), the fingers 5–4 on the F sharp–G sharp may cause considerable tension the chord.



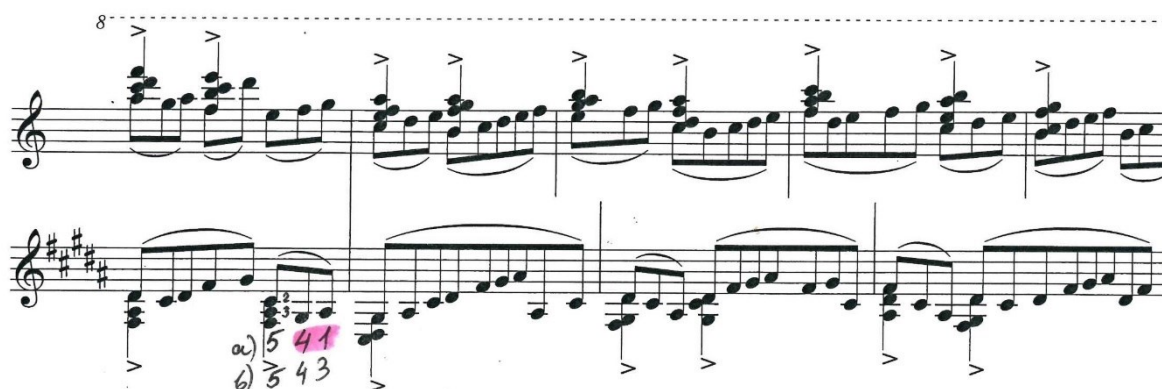
Example 8: Ligeti, Etude No. 1, page 12, line 3.

Example 9 illustrates the manuscript of the same bar fingered by Ligeti, in which finger omissions 5–2 and fingers 4–3–1 on the approaching chord D sharp –F sharp–A sharp are identical to those in Example 8.



Example 9: Etude No. 1, György Ligeti Collection, Paul Sacher Foundation, Basel.

In Example 10, fingers 4–1 are applied on the last two quavers in the left hand in (a), where the omission of the second and third finger provides a more natural and flexible transition to the succeeding chord. This fingering combination was also observed in the Ligeti’s sketches at the Sacher Foundation. However, the fingerings in (b) cause a certain amount of tension after the last quaver with the third finger, as the fingers do not ‘breathe’ before the chord in the next bar. The relaxation point is missing, and these fingerings makes the passage almost unplayable.



Example 10: Ligeti, Etude No. 1 page 13, line 2.

In Etude No 3, bar 26, the left hand presents two fingering options. Since the Etude is based on blocked keys, where the keys that are held are still played, creating a unique rhythmic pattern, it is crucial to carefully plan the fingering.

As shown in Figure 11, if executed as in shown in (a), the third finger is used on G flat, thus omitting the second finger after the first. Conversely, in (b), there is no omission of fingers. However, in this situation, it would be necessary to use the thumb twice, sliding from the silent A flat to A natural in the left hand. This requires the performer to be mindful of the first finger A flat in the right hand which is held. The interaction between the thumb in the left hand and the A flat in the right hand could potentially create a clash. To prevent this clash,

the right-hand first finger would need to be flexible and adjust slightly upward without re-striking the A flat, allowing space for the left hand's A flat. Given the fast tempo and the Etude's reliance on blocked/silent keys, it would likely be best to employ the fingering indicated in (a).

26

a) 1 3 4 3 2 1 2

b) 1 2 3 2 1 1 2

(mf)

sempre f

Example 11: Ligeti, Etude No 3, bar 26.

The next example of finger omission occurs in bar 39 of Etude No 3. Similar to the previous example within the same Etude, the performer must consider the held keys in the right hand.

With this in mind, a suitable fingering suggestion is provided in (a) of Example 12.

Here, the first finger (D) is followed by the fourth finger (C sharp), omitting the second and third fingers from the stepwise succession. This fingering facilitates the ascending run, utilising fingers 4–1 consecutively, and reduces the need for crossing the third finger F over the first finger E, as demonstrated in (b). In the latter, the crossover technique may hinder the indicated speed (*vivacissimo*, i.e. extremely lively) and make the execution of this passage heavier.

37

a) 4 3 2 1

b) 3 2 1 3

Example 12: Ligeti, Etude No. 3, bars 38-39

The next example, illustrated in Example 13, features Etude No. 4 bar 60 with two fingering possibilities in the left hand. In (a), the fourth finger is omitted after the C sharp. This omission coupled with the use of the fifth finger on the B allows the pianist to prepare the upcoming leap and provides flexibility from the B to F–C. However, in (b), using the fourth on B will be uncomfortable, as it would be difficult to stretch from B with the fourth finger to F–C with fingers 2–1.

Example 13: Ligeti, Etude No. 4, bar 60.

Executing some of the descending passages of Etude No. 10 would be challenging without omitting certain fingers from the stepwise succession, as demonstrated in Example 14. The highlighted fingerings in bars 82 and 84 are identical to those in the first line of the CPE Bach example as shown in Example 5. Since Ligeti did not provide fingerings, this passage in Etude No. 10 poses puzzling challenges in terms of finding optimal fingering solutions. Applying the technique of finger omissions in this passage can produce the most successful musical result.

Example 14: Ligeti, Etude No. 10, bar 84.

In the penultimate bar of No. 10 there are two omissions of fingering, highlighted in Example 15. Firstly, in the right hand, the fingering 1–5 omits fingers 2–3–4, followed by the fingering 5–3 which omits finger 4. The final omission in the right hand is the fingering 3–1, omitting the second finger. This fingering technique is also observed in the left-hand ascending scale, imitating a chromatic scale pattern. The employment of fingers 3–1–3 as illustrated, closely resembles Bach's example presented in the second line of Example 5.

Example 15: Ligeti, Etude No.10, bars 117-118.

When fingering a passage, attention should be given to fingering patterns, where possible. In the following example of the same passage from Etude No. 10, fingers are arranged in such a way that finger numerals coincide with the rhythmic groups. Example 16 shows the highlighted group of notes for each hand. The examples of pattern fingerings are derived from Musafia's *the Art of Fingering in Piano Playing* (Musafia, 1971). In this case, the use of fingers 5–4 in a row, thus without finger omissions, will be unavoidable.

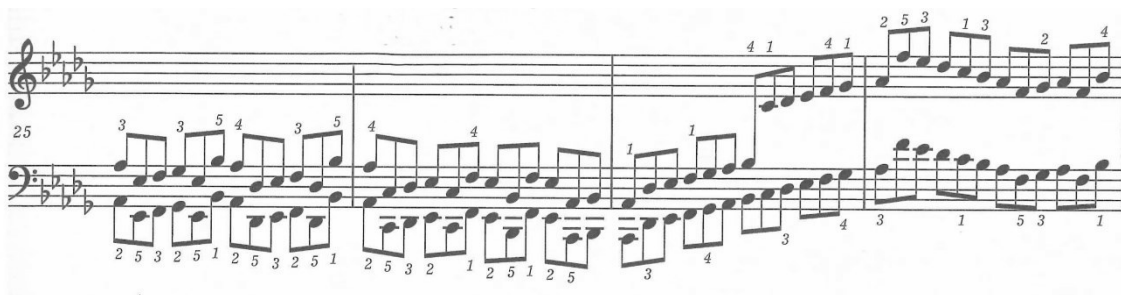
The image shows a musical score for Ligeti's Etude No. 10, bars 115-119. The score is written for piano and includes several dynamic markings: *cresc.*, *fff*, *cresc. molto*, *ffff p*, *sub.*, *al tempo primo*, *f*, *cresc. molto*, and *fff*. The score is annotated with handwritten pink boxes and numbers indicating fingerings for specific groups of notes. These include:  $10 = (3+4+3)$  at the top right;  $3\ 2\ 1$  and  $3\ 2\ 1$  above the right hand in bar 115;  $1\ 2\ 3\ 4$  above the right hand in bar 115;  $8 = (3+5)$  and  $12 = (4+4+4)$  above the left hand in bar 117;  $5\ 4\ 3\ 2\ 1$ ,  $4\ 3\ 2\ 1$ , and  $4\ 3\ 2\ 1$  above the left hand in bar 117;  $4\ 3\ 2\ 1$  above the right hand in bar 117;  $7 = (3+4)$  below the left hand in bar 118;  $4\ 3\ 2\ 1$ ,  $3\ 2\ 1$ , and  $4\ 3\ 2\ 1$  below the left hand in bar 118; and  $11 = (4+3+4)$  below the left hand in bar 119. The score also includes a performance instruction: "Durata ca. 2'20''".

Example 16: Ligeti, Etude. No. 10, bars 115–119.

Chopin himself regarded fingers 5–4 as having very little independence and in a passage like bars 25–28 of the fourth movement of Chopin Sonata No. 2, the editor of National Edition, Jan Ekier, has fingered it 5–3 with the omission of finger 4 in both hands, as it is a natural

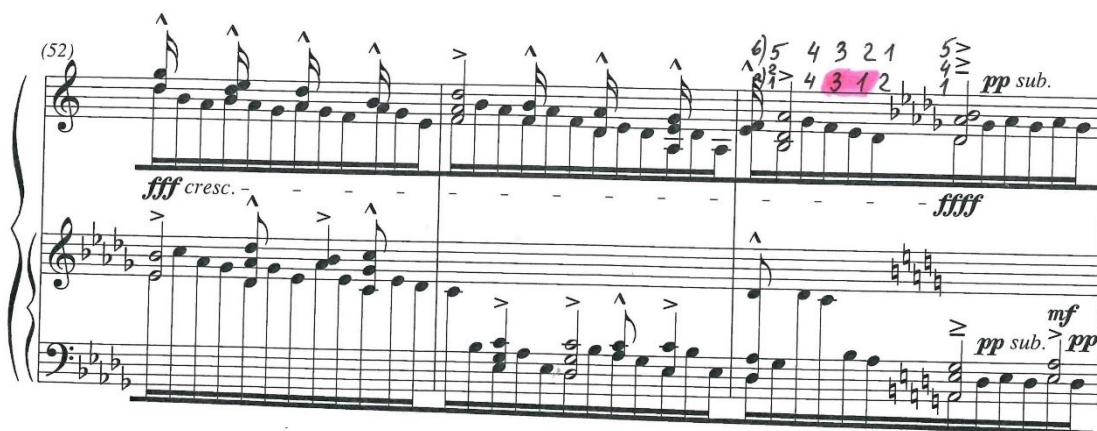


fingering pattern and lies naturally under the fingers (Eigeldinger, 1986, pp. 32–33).



Example 17: Chopin, Sonata No. 2 Fourth movement, National Edition.

There are two fingering solutions in bar 54 of Etude No. 12 *Entrelacs* as illustrated in Example 18. In (a), the omission of the second finger after F leads more smoothly and naturally to the chord D flat -A flat- B-flat with fingers 1-4-5. In (b), the fingers 4-3-2-1 descend in succession, but the connection to the chord will not be as smooth as in (a). In order to play the chord, the thumb needs to play twice, from D to D flat. It needs to be lifted after it plays the D, and it slides up to the D flat in the chord. Although these two fingering solutions are applicable, the fingering in (a) is my preference, as it is more natural and flexible for the hand.



Example 18: Ligeti, Etude No. 12, bar 54.

Continuing the analysis of the same Etude, two fingerings are outlined in bars 80 and 81 in Example 19. The fingering in (a) would undoubtedly be the most convenient one, with fingers 2–4, in which finger 3 is omitted. The return to A flat with a different finger, in this case finger 3, would provide more relaxation and flexibility in the hand. In (b), two problems may arise. Firstly, the use of finger 1 on G flat would be an awkward choice in this case. Secondly, the repeated fingers 2–3–2 on A-B-A, respectively, may create tension in the hand.

Example 19: Ligeti, Etude No. 12, bars 80–81.

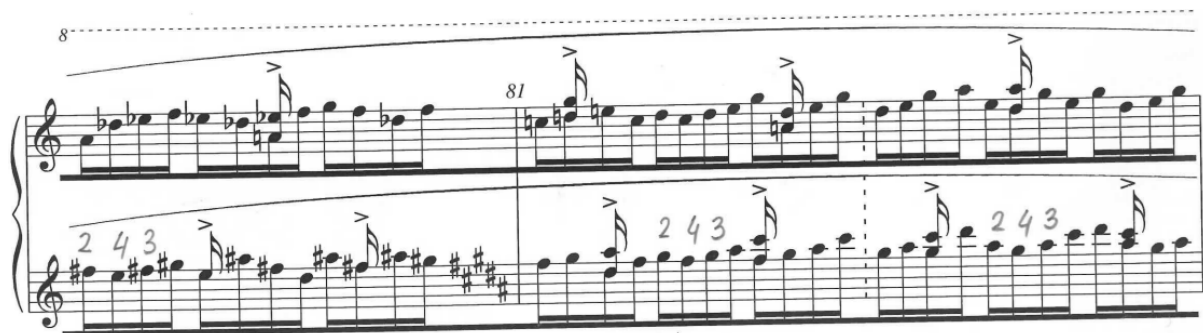
The final example from *Entrelacs* is bar 86 which presents interesting fingering solutions, as shown in Example 20. Depending on the performer's preferences, there are two possible fingerings here. To select between them, it is necessary to analyse this pattern in a broader context. The first possibility involves a trill-like fingering from the second half of bar 83.

Durata ca. 2'56''

Example 20: Ligeti, Etude No. 12, bars 83–87.

Although fingers 3–2 are commonly used in this passage, occasionally employing different fingerings on the same note can be beneficial, provided a recovery point for fingers. The second possibility involves using the same finger 3–2 providing the arm is fully relaxed and a circular motion is applied while using them for an extended period. After repeatedly employing fingers 3 and 2 as shown in (a), transitioning to fingers 5 and 2 in bar 86 (highlighted), creates a recovery point for the hand prior to continuing the trill-like passage following the minim C. The fingering 5–2 appears well-suited for the hand, and the distance between these fingers provides a great deal of flexibility in continuing the passage with

fingers 3–2. As can be seen in (b) of Example 20, the repetition of a trill-like section continues without finger omissions which may fatigue the hand. According to Musafia’s *The Art of Fingering in Piano Playing*, pianists should use a different finger on the same note if the passage structure permits. An example of this occurs in bars 80–81 of the Concerto’s final movement in the left hand, illustrated in Example 21. Here, three spots allow for the use of a different finger on the same note. Finger 3 is omitted between fingers 2–4. The note F sharp is played twice but with a different fingering each time. The first F sharp is fingered with finger 2, and the second F sharp, after E, is played using finger 3. This technique allows the hand to release tension between fingers 2–4–3 with a slight twist of the wrist to the left. Using the same finger for both notes would not allow for a successful recovery point, as the F sharps are played with the same finger 2, providing no opportunity for the hand to release tension between fingers 2–3–2.



Example 21: Ligeti, Piano Concerto, fifth movement, bars 80–81.

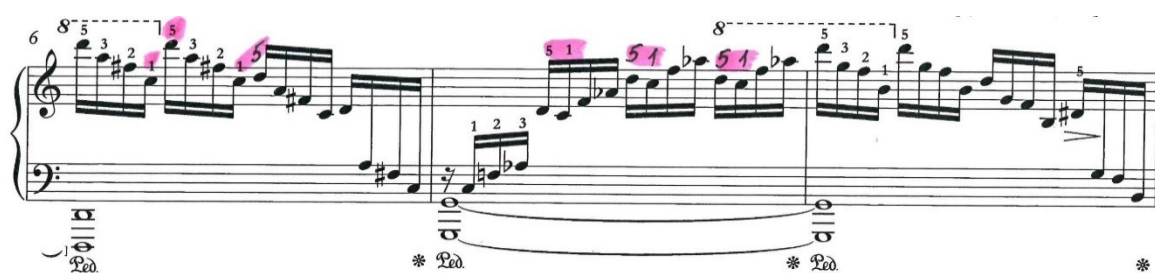
In bar 84 of the same movement, two fingering possibilities are presented in Example 22. The suggested fingerings used in (a) and (b) are almost identical, except for the first three notes where the resulting effect differs significantly. Similar to Example 21, the finger omission highlighted in (a) allows the hand a brief moment of relaxation before continuing the journey

on rapid semiquavers, whereas in (b), playing with fingers 3–4, the movement of the hand causes tension, resulting in an uneven execution of the subsequent semiquavers.



Example 22: Ligeti, Piano Concerto, fifth movement, bar 84.

Omission of fingers from the stepwise succession provides pianists with a sense of elasticity in the fingers and smoothness of line. Similar to Example 5 mentioned above by CPE Bach, Chopin Etude No. 1 Op. 10 would be an excellent demonstration for this. As highlighted in Example 23 (bars 6–7, 15, 17, and 19), three fingers are omitted after the fifth finger, providing a great deal of flexibility for the thumb and the approaching notes. It is hard to imagine any alternative fingering for these pianistically wonderfully written passages.



Example 23: Chopin, Etude Op. 10, No. 1, bars 6–7, 15, 17, and 19. Peters Edition

The first line of coda of Etude No. 16 Pour Irina, which in some ways has *Chopinesque* features, serves as the following illustration from Ligeti's works. The finger omissions highlighted in red in both hands resemble the ones that were seen in the first example of Chopin's Etude No 1 (bars 6–7).

**Molto vivace** 13

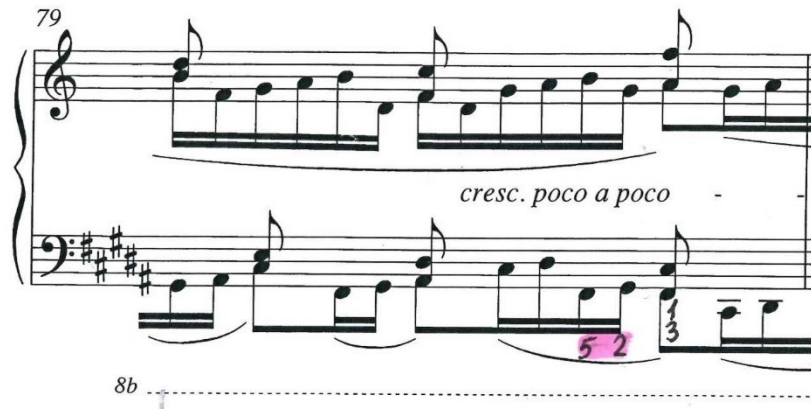
(Duration of  $\square$  is equal to the previous  $\square$  and to the  $\square$  at the beginning)  
 ( $\square$  dauert so lange wie vorhin  $\square$  und zu Beginn  $\square$ )

*sub. ppp (die Akzente mf)* *sempre pianissimo*

Example 24: Ligeti, Etude No. 16. Page 13, first line.

Some relevant examples of finger omission are present in the first movement of Ligeti Piano Concerto. In Example 25, bar 79, F sharp and G sharp in the left are played with fingers 5–2

where fingers 3–4 are omitted. This fingering prepares the succeeding chord F sharp and C sharp to be played with fingers 3-1 with a great sense of flexibility.



Example 25: Ligeti, Piano Concerto, first movement, bar 79.

An analogous example is present in bar 81 in the left hand of the same movement. In my experience of playing this movement, fingers 4–2 in (a) worked efficiently as finger 4 on C sharp provides with a great sense of agility for itself, and the succeeding D sharp and the chord C sharp and F sharp. In (b), in contrast, the use of fingers 3–2 followed by 3–1 on the chord does not seem as efficient as in (a). This causes tension and limitation in the hand movement and endangers the appearance of the powerful chord with the triple forte (see also the final two semiquavers in bar 84 of the same movement leading to the chord in bar 85, in Example 27).

Example 26: Ligeti, Piano Concerto, first movement, bar 81.

Example 27: Ligeti Piano Concerto, first movement, bars 84–85.

Finally, I will analyse some examples of the omission of fingers, with intervals. That is, when the omission of fingers occurs between a single note and an interval. Although Bach did not specify this technique, it may be worthwhile to investigate it. The third line of Etude No. 16 is a case in point. The fingerings were found in the Ligeti Manuscript collection at the Paul Sacher Foundation. This is one of the rare examples of Ligeti's work that contains printed fingerings. There are two essential omissions of fingers highlighted in Example 28. The first is the combination of the G flat octave, with an obvious fifth finger added to the lower note



and the third finger A flat. The omission of the fourth finger leads smoothly to the following interval. Afterwards, the interval F–C, particularly the fourth finger F, continues the journey to its adjacent G flat with the second finger, by leaving out the third finger from the succession. These fingering combinations facilitate the challenging passage work of the left hand in this Etude and allows the hand to relax any tension that could easily accumulate from the beginning of the section.

Example 28: Ligeti, Etude No. 16, page 10.

I have highlighted some points where the omission of fingers technique can be helpful in executing the Etude No. 14. In the perpetual ascending passages of this Etude an impression is created by a tempestuous ocean. This fingering technique provides a recovery point for the fingers to continue the journey of the colossal waves. As highlighted, transitions illustrate the omission of certain fingers; some adjacent notes have also been marked to clarify the passage and make the fingering for the succeeding notes more evident.

Example 29: Ligeti, Etude No. 14, bars 3–6.

The final example analysed in this chapter is Etude No. 17, page 19, second line in left hand, as shown in Example 30. There are two fingering suggestions. In (a), omission of fingers is applied which provides with a great deal of ease for the fingers. In (b), non-omitted fingers are indicated which causes strain in the hand.

a) 1 2 3 4 2 3 1 3 4 2 3 1 2 5 4  
 b) 4 3 4 1 2 3 2 3 2 3 *cantabile*

Example 30: Ligeti, Etude No. 17, page 19, second line.

### 3.2 ADJACENT TONES, STRUCK SIMULTANEOUSLY, TAKEN BY ADJACENT FINGERS

CPE Bach states that the notes before and after the seconds will determine what pair of fingering should be used and that the thumb should avoid black keys.

This fingering technique helps achieve natural and efficient hand movements across the keys and facilitates the execution of legato lines.

Below is the illustration of adjacent tones by CPE Bach.



Example 31: Adjacent tones (Bach, 1753).

In Ligeti's Etude No.13, there are several cases of intervals of seconds (i.e., adjacent tones) as highlighted in bars 11–12 of Example 32. I noticed I was mistaken with my fingering decision for G flat–A flat in bar 12 when working on the fingering in this Etude. Although the use of non-adjacent fingering 2–4 was feasible, the use of fingers 2–3 on G flat–A flat, following the analysis of Bach's example, allowed greater flexibility in the hand.

(11) *capriccioso* *tre corde* *mp* *mf*

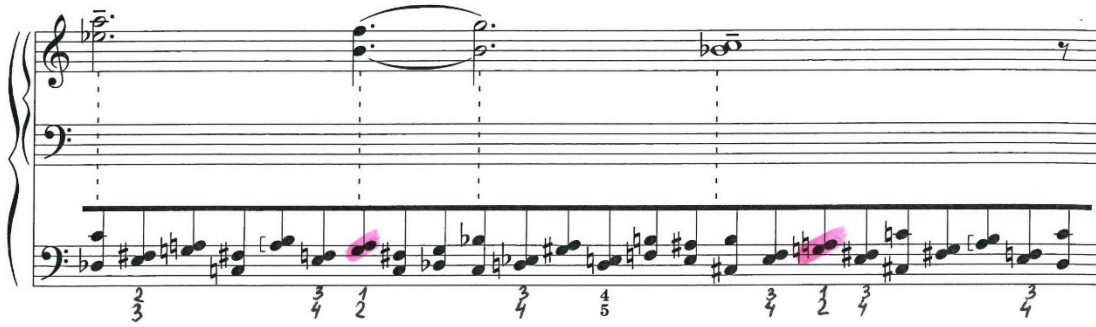
(cresc.) - - - - *p* cresc. - - - - *mf* cresc. - - - -

(12) *f* *mf* *cresc.*

Example 32: Ligeti, Etude No. 13 bars 11–12.

Etude No. 13 appears perfectly suitable for Bach’s fingering system for adjacent tones, and, interestingly, the incorrect use of it will result in hand discomfort.

It is difficult to know whether Ligeti knew about Bach’s fingering rules, but the next example is another interesting one from Etude No. 17, the left hand, top line of page 20. In Example 33, the pair of fingerings used for the left hand seems indispensable for this passage. The highlighted quavers may be played with double thumbing; however, the use of the pair fingering 1–2 is more suitable for this passage. It is worth highlighting that the printed fingering 5–4 on D–E is one of the few fingering examples provided by Ligeti. The fingering indication follows the principle of pair fingering of adjacent tones.



Example 33: Ligeti, Etude No. 17, page 20, first line.

There are interesting fingering configurations in Etude No. 10, bars 42–48 in the left hand. While the use of adjacent fingerings is obvious in bars 43–44, there are more than one fingering possibilities for bars 45–47. As can be seen in Example 34, non-adjacent fingering combinations for adjacent keys are indicated, such as fingers 4–1, 3–1 or 5–3. They are all applicable depending on the physicality of the hand and fingers.



Example 34: Ligeti, Etude No. 10, bars 42–48.

The final example of this fingering technique is from Etude No. 15, bars 1–3. The adjacent fingers help achieve a seamless line and perfect legato quality with the preceding and succeeding notes as illustrated in Example 35.

Andante con tenerezza,  $\text{♩} = 52$  sim. al fine

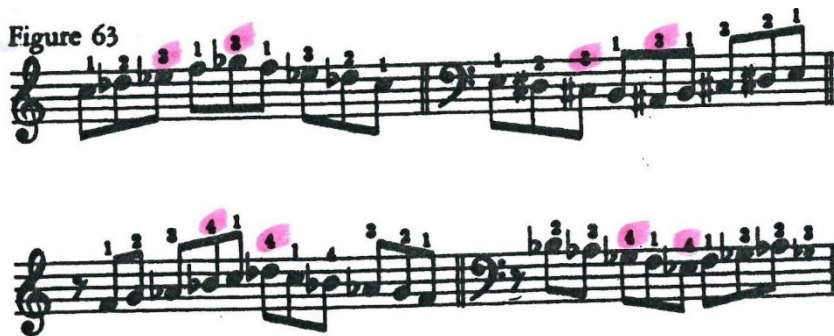
*sempre p, sempre molto legato, cantabile espressivo* sim. al fine

*sempre sim.*

Example 35: Ligeti, Etude No. 15, bars 1–3.

### 3.3 FINGERING RELATED TO THE PASSING OF THE THUMB WITH MANY ACCIDENTALS IN SMALL PASSAGE RANGE

According to CPE Bach in fingering rules, in situations where passages are not long enough to necessitate the succession of the fingers after the thumb has turned, it is advised to use the finger that precedes the thumb. By doing this, the hand position will remain the same and the uncomfortable shift brought on by a swift crossing will not occur. As shown in Example 36 by CPE Bach, the note F, which is played with the thumb, is surrounded by two accidentals, E flat that precedes the thumb and G flat that succeeds the thumb. The G flat is depressed by finger 3 which is the same finger that precedes the thumb. In this case, the thumb acts as a pivot surrounded by two accidentals that are taken with the same finger. This fingering technique helps to maintain the same hand position where the passage range is not big enough.

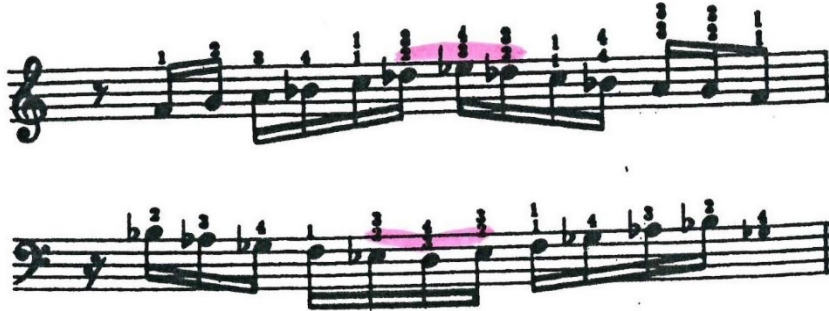


Example 36: Fingering related to the passing of the thumb (Bach, 1753).

This rule only applies to situations where the thumb is followed by a single tone. However, when two (or more) notes come after the turn, the fingers will be played in the normal succession. Example 37 contains two fingering options marked by CPE Bach. The upper fingerings (fingers 3–4–3 in the right hand and 3–4–3 in the left hand) are still feasible, but



the adjustment would be uncomfortable after the thumb has turned. As a result, it is advisable to use fingers 2–3–2 in the right hand and fingers 2–3–2 in the left hand, as highlighted.



Example 37: Fingering related to the passing of the thumb (Bach, 1753).

I will now examine some musical examples in Ligeti's works related to the above-mentioned fingering technique. This device sets the pattern in the beginning of Ligeti's famous *Touches bloquées* Etude No. 3 as shown in Example 38.

**Vivacissimo, sempre molto ritmico**  
*sempre legato*  
*p*  
"stuttering" / „stotternd“  
senza ped. (sempre)

Musical notation for Example 38, consisting of three systems of staves. Each system has a treble clef staff on top and a bass clef staff on the bottom. The notation features a rhythmic pattern of eighth notes with fingering numbers 3, 1, 3 written above them. Performance instructions include 'Vivacissimo, sempre molto ritmico', 'sempre legato', 'p', and 'senza ped. (sempre)'. A quote "stuttering" / „stotternd“ is placed between the staves. Bar numbers 6 and 10 are indicated at the start of the second and third systems respectively.

Example 38: Ligeti, Etude, No. 3, bars 1–13.

Despite Ligeti's unique approach to held notes (the notes are physically depressed and held with one hand, but they do not sound when the other hand plays on the same keys), the fingering technique is identical to that of CPE Bach. The diamond-shaped notes are the ones that are held. Although the first bar of the Etude can be fingered in a variety of ways, it appears to me that, in (a), the first finger on D preceded by the third finger on E flat is the most appropriate fingering as opposed to the second finger on E flat shown in (b) (Example 39). In addition, while it is not incorrect to play the first two quavers G flat and F with fingers 5 and 4, respectively (as illustrated in (b)), it seems that the rhythmic precision will be more clearly defined if played with fingers 3 and 2 (as illustrated in (a)).

**Vivacissimo, sempre molto ritmico**

senza ped. (sempre) *p.*

Example 39: Ligeti, Etude No. 3, bar 1.

It is interesting to see that Ligeti composed a different hand distribution for the beginning of the Etude where the hands are swapped, i.e., the left hand begins the quavers while the right hand holds the chords silently.

ÉTUDE 3 « TOUCHES BLOQUÉES » BURNS  
*Jeffrey*  
 Presto possibile, sempre molto ritmico (ca.  $\text{♩} = 132$ )

senza ped. sopra 1 2 3

3 1 2

2 3 2

1 3 2

1 5 4 2

— = 3/8 sub-measure  
 otherwise count in groups of 2/8

Example 40: Etude No. 3, the opening. György Ligeti Collection, Paul Sacher Foundation, Basel.

There are two instances in Ligeti Etude No. 1 worth discussing, line 2, page 7 as shown in Example 41.



Example 41: Ligeti, Etude No. 1, page 7, second line.

The first group, fingering 3–1–2–3 on D–E–F–G, is the one that closely resemble Bach’s rules on two notes played with fingers in their normal succession as seen earlier in Example 37. In the example above, fingers 2 and 3 are applied after finger 1. The second group of fingering 3–1–3, labelled (a), is associated with Bach’s fingering rule on taking the note with the same finger that precedes the thumb (Example 36). In this case, D is taken with finger 3 and the same finger applied to F after playing finger 1 on E. Even though this right-hand passage is based on the white notes, the use of the third finger before and after the thumb proves to be successful. Other fingering possibility for this passage is the use of the five fingers in succession, fingers 2–3–4–5 on C–D–E–F, respectively, shown in (b). Even though this fingering possibility is not wrong, taking fingers 4 and 5 on the E and F may loosen the finger precision. The third finger after the turning of the thumb would link securely to the following octave.

Another example of this fingering technique is Etude No. 10 bars 82–84 as shown in Example 42. Although five-finger position works well for the pattern from A flat to E natural, it is not advised to use the same fingering pattern for the next passage. On the penultimate

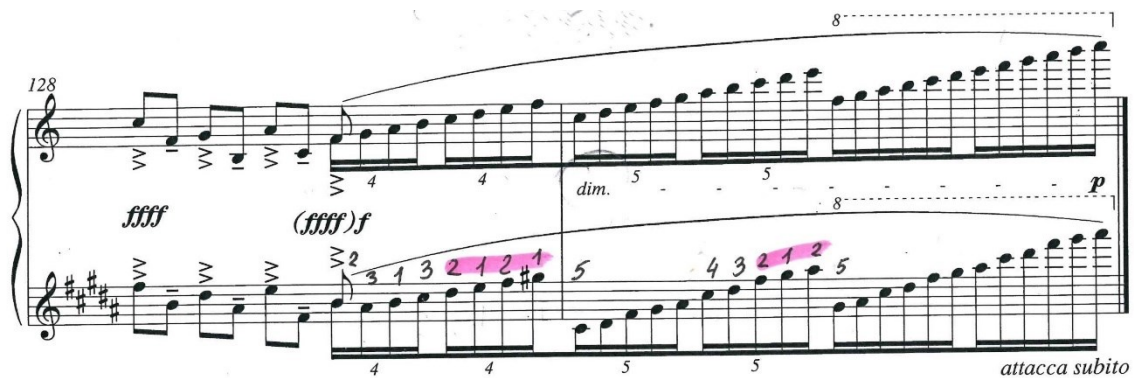
quaver of bar 82, the pattern should begin with finger 4 on A natural, allowing the third finger to be placed on A flat and followed by the thumb on the G. By doing this, the third finger A flat that precedes the thumb will be placed again on the G flat that follows the thumb. Similarly, it occurs in bar 84 and 85. In the latter, the second finger is placed on A flat, and the same finger will be placed again on F after the thumb has played G flat. In doing this, hand will remain in the same position, and it will be easier to execute rapid descending quavers of bar 85.

Example 42: Ligeti, Etude No. 10, bars 82–85.

Etude No. 17, the final passage of the third line of page 20 in the left hand is another example shown below.

Example 43: Ligeti, Etude No. 17, page 20, third line.

In this passage there are two parts that are related to this fingering technique. In the first part, descending notes E flat–D–C are played with fingers 3–1–3 (fingers 1–3 are by Ligeti) followed by an ascending scale from finger 4 on B natural and using the third finger twice before and after the thumb on C and E flat. While it is not wrong to use five fingers in succession from B natural to F, as shown in (b), it seems to me that the use of 3–1–3 in (a) works more efficiently for this passage as it maintains the hand in its the single position. The final example are bars 128–129 of Concerto’s first movement as shown in Example 44. In the left-hand ascending passage, there are two places where this fingering technique can be employed. First, the final four semiquavers in bar 128, with fingers 2–1–2–1. By using this fingering, the second finger will be used again after crossing over the thumb. In doing so, the G sharp will be taken with finger 1, allowing a secure jump from G sharp to the following C sharp with finger 5. Similar fingering technique continues in the next bar with fingers 2-1-2 which, in turn prepares finger 5 well on G sharp.



Example 44: Ligeti, Piano Concerto, first movement, bars 128–129.

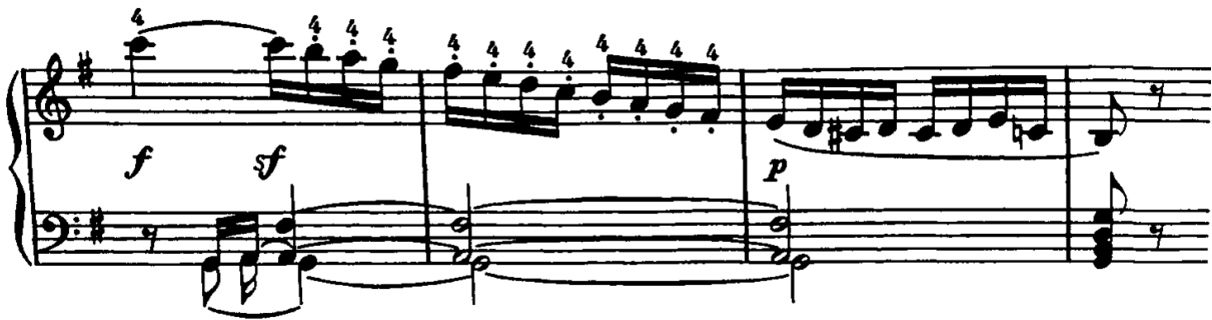
### 3.4 PLAYING TWO ADJACENT NOTES WITH THE SAME FINGER

In the Essay, CPE Bach spoke about the use of the same finger twice consecutively when the keys change. The most common use of this device involves changing the same finger from a black key to an adjacent white one. The slide was more effectively used for slurred notes, since it ensured a well-expressed phrasing, although its use on detached notes was also possible. As can be seen in Example 45 from Bach's fingering rules, the fifth finger on B flat in the right-hand changes to its adjacent key, A. In the left hand, the fifth finger on C sharp gently slides to its adjacent key, D.



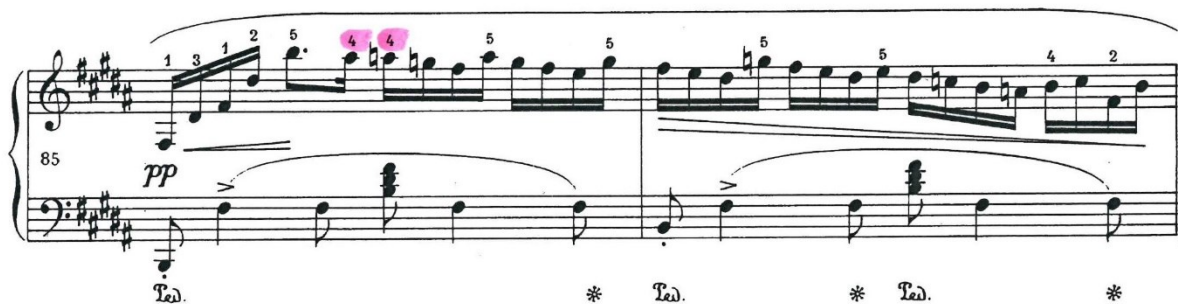
Example 45: CPE Bach, Fingering, Rule, 89.

In accordance with Bach's rule, Chopin's use of the same finger to play two neighbouring notes was one of his most significant fingering developments widely applied in his works. There are also some instances of finger successions in the works of other composers that Chopin noted for his pupils. For example, successions of the fourth finger in bars 194–195 of the first movement of Beethoven Sonata Op. 14 No. 2 are illustrated in Example 46. (Eigeldinger, 1986, p. 116). It is also worth highlighting that this fingering technique was mentioned by British pianist and pedagogue Tobias Matthay in *The Principles of Fingering and Laws of Pedalling* (1908) as well as in Musafia's *The Art of Fingering in Piano Playing* (1970).



Example 46: Beethoven, Sonata Op. 14 No. 2, first movement, bars 194–195.

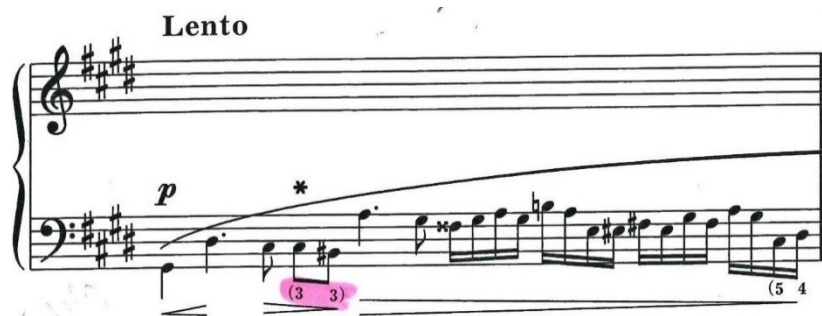
In Chopin's example (as seen in Example 46), the succession of the same finger could be assigned to any finger. In Nocturne Op. 62 No. 1, bar 85, as shown in Example 47, Chopin applied the succession in which the fourth finger slides from A flat to A natural creating a seamless legato.



Example 47: Chopin, Nocturne Op. 62 No. 1, bar 85.

Another example is the opening of Chopin's Etude Op. 25, No. 7, where the third finger on C sharp in the left hand slides down to B sharp with the same finger as illustrated in Example 48.

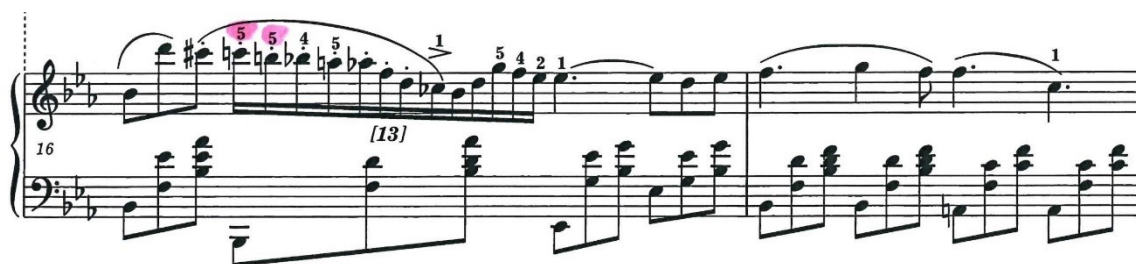




Example 48: Chopin, Etude Op. 25 No. 7, the opening.

Examples of the repeated 2<sup>nd</sup> finger indicated by Chopin were found in Beethoven's Sonata Op. 14, No. 2, first movement, bars 187-188, from A sharp to B, and in Chopin's Prelude Op. 28, No. 6 bar 6, from F sharp to E sharp, and bars 17-18, from F sharp to G (Eigeldinger, 1986, p. 116).

There are some instances of sliding from white key to white to ensure the smoothness of line, such as in Chopin Nocturn Op. 9 No. 2, bar 16 using the fifth finger, as can be seen in Example 49.



Example 49: Chopin, Nocturn Op. 9 No. 2, bar 16.

It is worth observing bars 43-46 of Chopin's Etude Op. 25, No. 6 where the thumb in the left hand, in addition to a two-note movement in bar 44 is moving from note to note in succession three times.

Example 50: Chopin, Etude Op. 25 No. 6, bars 43–46.

There are also numerous occurrences of Chopin marking thumb on successive notes (see Peters Edition of the 1<sup>st</sup> and 3<sup>rd</sup> *Nouvelles Etudes*).

The succession could also occur in one of the voices in double notes as shown in bar 6 of Etude Op. 10, No. 3.

Example 51: Chopin, Etude Op. 10, No. 3, bar 6.

The use of this device is also significant in Ligeti's works. In the manuscript of Etude No. 9 autograph fingerings were found for the succession of the first fingers as shown in Example 52 (these passages correspond to bars 117–120 of the Schott edition).



Example 52: Ligeti, Etude No. 9, György Ligeti Collection, Paul Sacher Foundation, Basel.

There are two fingering possibilities in Etude No. 9, bar 17, as shown in Example 53. The first option, indicated in (a), is to use finger 5 twice on D flat that changes to its adjacent C, followed by fingers 4 and 3. The second option in (b) is to employ fingers 5 and 4 on D flat and C, respectively, followed by fingers 3 and 2.

b) 5 4 3 2  
a) 5 5 4 3

Example 53: Ligeti, Etude No. 9, bar 17.

While these two versions are appropriate, in my experience of playing this piece, the fingering in (b) creates a lot of tension in my hand. The tension occurs between 4–3–2. It seems to me that the most convenient fingering is the use of the same finger from D flat to C. In this case, the hand has more chance to relax as the fifth finger slides from black key to white with ease. As the entire Etude is built on the sliding chromatic lines, the slide of the same finger would be indispensable for this Etude. Other examples include bars 25–27, sliding of the fifth finger from black to white keys.

(25)

(ppp) *cresc. poco a poco*

*mp* *cresc. poco a poco*

*poco ped.*  
*emphasize the melody / die Melodie hervorheben*

Example 54: Ligeti, Etude No. 9, bars 25–27.

Successions of the fourth finger from F sharp to F natural, in bar 45:

Example 55: Ligeti, Etude No. 9, bar 45.

Successions of the thumb in bar 52 of the same Etude as shown in Example 56.

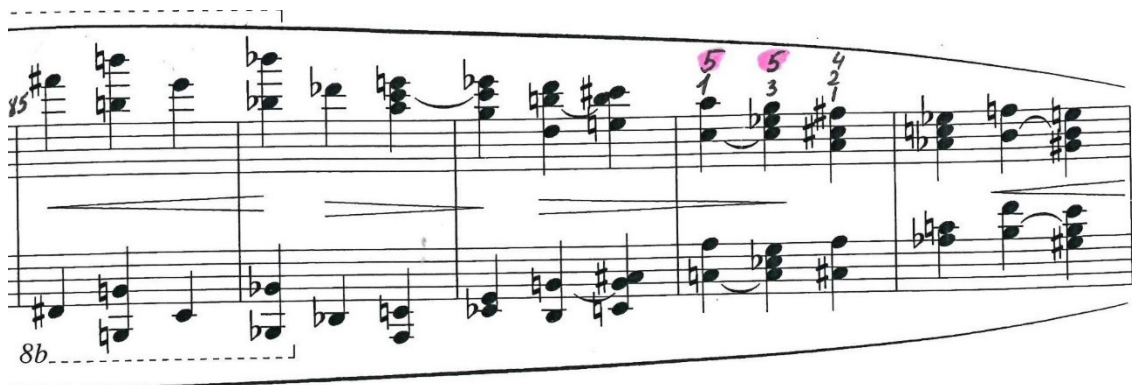
Example 56: Ligeti, Etude No. 9, bar 52.

In the second movement of the Trio, bar 73, right hand, the slide from the fifth finger G sharp to fifth finger G natural seems the most suitable fingering for this pattern. With the slide and the inward wrist movement, the connection between the quavers will have more shape and the accuracy of rapid quavers will be maintained.



Example 57: Ligeti, Horn Trio (piano part), bar 73, second movement.

In the third movement of the Trio, bar 88 right hand, holding the tied C with the thumb, and the third crotchet chord with fingers 1–2–4 makes necessary to use the fifth finger on A and G.



Example 58: Ligeti, Horn Trio (piano part), bar 88, third movement.

In the third movement of the Concerto, bar 21 in the left hand, the thumb slides from E flat to E natural where the slurred group ends and allows the hand a recovery time before commencing the next group.

21

*poco f*

*p*

*mf p* *poco f p* *f* *p*

(*poco cresc.*)

Example 59: Ligeti, Piano Concerto, bar 21, third movement.

### 3.5 FINGER SUBSTITUTIONS ON THE SAME NOTE

A silent change of finger on the same note was widely used in CPE Bach's pieces and cultivated in Chopin's piano writing. This technique allows the note to be well connected to the succeeding one through a finger action. Any fingering substitution is possible on the keyboard depending on the shape and the structure of the line. The example below is from CPE Bach's Essay.



Example 60: Finger substitutions on the same note (Bach, 1753).

In (a) of Example 60, treble clef, the right hand, finger 5 changes silently to finger 2. In (a), bass clef, silent change happens between finger 5 and 1 in the left hand over the tied E.

In (b), treble clef, right hand, finger 1 changes silently to finger 2. Lastly, in (b), bass clef, left hand, finger 1 switches to finger 3.

As the technique requires great flexibility in the hand, it is more typical to employ it on longer notes where there is more time for finger substitutions, although substitutions in quicker tempos are also possible, as shown below. All fingering in Example 61 is Chopin's (Eigeldinger's Peters Edition identifies it).





Example 61: Chopin, Prelude Op. 28 No. 6, bar 23.

Although not marked in the scores, finger substitution on the same note plays a significant role in Ligeti's piano compositions. As in CPE Bach's and Chopin's works, it aims to provide a smooth legato touch from note to note and maintain the evenness of the line.<sup>4</sup>

It would be necessary to apply a finger substitution in the second movement of the Trio. In the example below in bar 194, the right-hand chord A-E is played with fingers 1-3 in which finger 3 changes to finger 2, allowing the succeeding chord A-B to be reached with finger 5 with ease.



<sup>4</sup> There are two categories of fingering substitutions in Chopin's works. The first category is to secure the legato between two notes. And the second category, the innovatory substitutions is to highlight the tonal possibilities unique to a particular finger, or to obtain evenness in Chopin's beautiful *cantabile* lines (Chopin, Prelude Op. 28 No. 6, bar 15, left hand, first E, fingers 1-3, bar 24, left hand B, fingers 2-1, Prelude Op 28 No 16, bar 5, right hand, A flat, fingers 1-2) (Eigeldinger, 1986, p. 117).

Example 62: Ligeti, Horn Trio (piano part), bar 194, second movement.

The same principle applies to bar 199 of the same movement. Here, it will be necessary to apply the finger substitution with fingers 2–1 on the final quaver G, allowing a smooth legato connection to the following chord B flat- F with fingers 2–5, respectively.



Example 63: Ligeti, Horn Trio (piano part), bar 1, second movement.

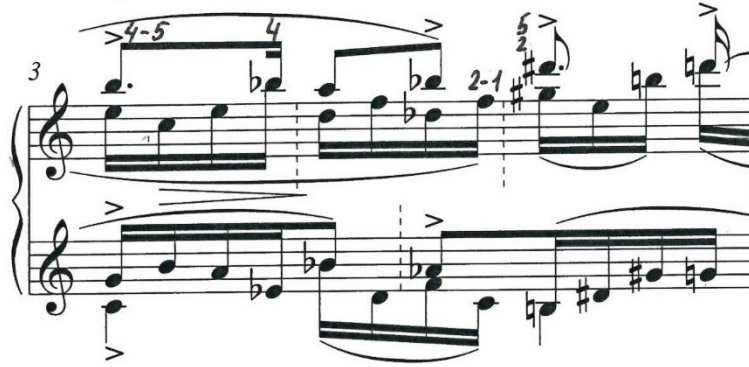
At the end of Etude No. 4, as shown in Example 64, double finger substitutions can be used to maintain a smooth legato line. In bar 209, left hand chord A–F, fingers 5–2 changes to 3–1 over the tied chord. Similarly, in bar 210, G–C fingers 4–2 changes to 3–1 in order to connect the final chord D–B flat with fingers 5–2.



Example 64: Ligeti, Etude No. 4, bar 209–211.

There are two places of fingering substitution in Etude No. 5, bar 3, the right hand as illustrated in Example 65. The first note B taken with finger 4 changes silently to finger 5,

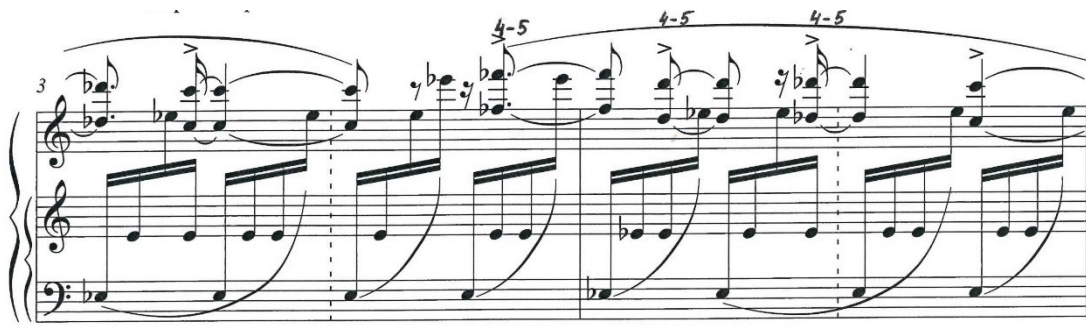
which allows a smooth legato to the following note. It is desirable to consider finger substitution for the final semiquaver of the same bar. F is first taken with finger 2, then changed to finger 1. This substitution allows a little wrist breath before the following chord G sharp-D sharp.



Example 65: Ligeti, Etude No. 5, bar 3.

While experimenting with fingerings for this spot of bar 3, I have realised that even though the standard use of finger 2 without substitution is also possible, the finger transition from the second finger F to the second finger G sharp would be abrupt and would not match the overall gentle flow of the semiquaver line.

There are several possibilities of finger substitutions in Etude No. 6. As shown in Example 66, it would be necessary to substitute fingers in the right hand in order to maintain evenness in the top line of the octaves. These are fairly quick finger substitutions between the fingers 4-5 and the substitutions should occur before the final semiquaver is struck in the right hand. This technique requires a great sense of flexibility in the hand and control for the evenness of the line. It serves as a model for the remainder of the octaves present in this Etude.



Example 66: Ligeti, Etude No. 6, bars 3–4.

In bars 99–100 of the same Etude, finger substitutions will be necessary for maintaining the legato line: in the right hand, the last chord C–G finger 4 changes over 3; in bar 100, right hand A flat, finger 4 changes over finger 1.



Example 67: Ligeti, Etude No. 6, bars 99–100.

Because of the density in polyphonic lines and the multi-layer structure in Etude No. 6, finger substitutions are encouraged to be employed from bar 43 onwards in the right hand. It is a challenging task to finger every single note; the performers should trust their musical instinct

for finger substitutions in order to obtain a good legato touch.

There are numerous instances of finger substitutions in Etude No. 15, as highlighted in Example 68. In bar 3, chord C–A, where A is played with finger 3, then changed to finger 2 to provide a smooth connection with the following E finger 5. There are three options of finger substitutions on the fifth minim after the dotted bar line in bar 3, as illustrated. Substitutions also occur in the left hand in bar 4, with fingers 5–4 on F, as well as in bar 6, fingers 5–1 on C. These substitutions are important elements for achieving expressive legato and evenness of tone.

The image shows a musical score for Ligeti's Etude No. 15, bars 3-6. The score is written for piano and consists of two systems of staves. The first system covers bars 3 and 4, and the second system covers bars 5 and 6. The music is in a 3/4 time signature. The right hand plays a melodic line with eighth and sixteenth notes, while the left hand plays a harmonic accompaniment with chords and single notes. Pink handwritten annotations highlight specific finger substitutions: '3-2' and '3-5' in the right hand of bar 3; '5-4' in the left hand of bar 4; '4-5' in the right hand of bar 5; and '1-2' and '5-1' in the left hand of bar 6. A dotted bar line is present in bar 3, after the fifth minim. The annotations also include numbers 1-5 indicating the fingers used for each note.

Example 68: Ligeti, Etude No. 15, bars 3–6.

### **3.6 THE USE OF THE THUMB AND LITTLE FINGER ON BLACK KEYS AND THE PASSING OF THE THUMB UNDER THE FIFTHS FINGER ON BLACK KEYS**

One of the most significant differences between the early and modern fingering systems was the role of the thumb. As seen in Figure 3, the thumb was rarely used as a pivot in the early fingering systems. Evidence of the gradual change in the employment of the thumb can be observed in CPE Bach's quote:

My deceased father told me that in his youth, he used to hear great men who employed their thumbs only when large stretches made it necessary. Because he lived at a time when gradual but striking change in musical taste was taking place, he was obliged to devise a far more comprehensive fingering and especially to enlarge the role of the thumbs and use them as nature intended (Bach, C.P.E., 1949, p. 42).

The fundamental principles of modern keyboard fingering were first widely known by CPE Bach (Ferguson, 1975, 77). Among the important characteristics of modern fingering were the use of the thumb as a pivot to achieve lateral movement of the hand, as well as the use of the thumb and the 5<sup>th</sup> finger on white keys solely, unless a large interval or a leap occurred. The passing of the thumb was used after the 2<sup>nd</sup>, the 3<sup>rd</sup>, and the 4<sup>th</sup> finger, but not under the 5<sup>th</sup> (Ferguson, 1975, p. 77).

In the musical examples below, I will examine some instances of unique fingerings in Chopin's own works and analyse how Chopin's fingering shaped Ligeti's piano writing. Chopin's innovations in keyboard fingering included the use of the thumb and little finger on black keys and the passing of the thumb under the fifth finger. According to Eigeldinger,

‘Chopin unashamedly used the thumb on black keys, or passed it under the fifth if it helped to facilitate the performance and lend it more evenness and quietness’ (1986, p. 40).

This device was applied in many of his works, including Etude Op. 10, No. 5 (an étude based exclusively on black keys with the wide use of the passing of the thumb under the fifth finger) as well as in Etude Op. 25, No. 11 as illustrated in Example 69 and 70, respectively.

Example 69: Chopin, Etude Op. 10, No. 5, bar 31–32.

Example 70: Chopin, Etude Op. 25, No. 11, bars 17–18, and 58.

Chopin’s excessive use of the passing of the thumb under the fifth finger can also be seen in Etude Op. 10 No. 1, on white keys. The use of the thumb and the little fingers

on the black keys, as well as the crossing over was applied in Ligeti's piano works too. The thumb on black keys should never be refrain from using if it makes the passage comfortable to play. A peculiar example of the thumb on two consecutive black keys can be seen in Ligeti's Etude No. 12 bar 77, highlighted in the right hand. While it may be uncommon to imagine this fingering at first, it seems to me that with slight inward turn in the wrist the use of the thumb on the D flat and then B flat proves to be the most convenient fingering (see Example 71).

The image shows a musical score for Ligeti's Etude No. 12, bar 77. The score is written for piano and consists of two staves: a treble clef staff (right hand) and a bass clef staff (left hand). The key signature is three flats (B-flat major/D-flat minor). The time signature is 4/4. The right hand part starts with a dynamic marking of *mf* and a *pp* marking. The left hand part starts with a dynamic marking of *mf* and a *f* marking. The right hand part has a *sim.* marking. The left hand part has a *sim.* marking. The right hand part has a fingering diagram above it: 5 4 3 2 1 1 4 5. The first '1' is highlighted in pink. The score is marked with (76) at the beginning of the right hand staff.

Example 71: Ligeti, Etude No. 12, bar 77.



As illustrated in the next example below, the thumb is employed freely for consistency in the left hand, bars 13-14 of Concerto's final movement.

The image shows a musical score for Ligeti's Piano Concerto, fifth movement, bars 12-14. The score is in 7/8 time and features a complex, chromatic texture. The left hand part is marked "scarcely audible" and "nur wie ein Hauch" with a dynamic of "pppp". The right hand part is marked "una corda". The score shows a sequence of notes with various accidentals, including flats and sharps, and includes fingering numbers 8 and 15. The right hand part includes a "pocchiss. cresc." marking.

Example 72: Ligeti, Piano Concerto, fifth movement, bars 12–14.

Several occurrences of the thumb on black keys can be found in the Concerto's third movements, including bars 33, 35, 36 and 39 in the left hand.

The employment of a thumb or fifth finger on a black note is inevitable in Ligeti Etude No. 1 in the left hand since the left hand is built on black keys. The final two lines of Ligeti Etude 1 in the left hand can be performed by crossing the fifth finger over the thumb. In Example 73, the F sharp is played with the thumb followed by the fifth finger passing over on the G sharp as indicated in the example below. The pattern repeats on the final ascending line where the similar passing fingering occurs three times. There is no evidence to support Ligeti's intended fingering for this passage; however, with the exception of the three final notes, where the third finger is used after the thumb, I argue that the fingering discussed is appropriate because the fingers can be applied in succession beginning with the fifth finger after the thumb has been crossed (as indicated in the score). It helps to maintain the same

hand position longer and avoid having too many unnecessary cross overs throughout this ascending, rapid passage.

8

8

Durata  
ca. 2' 20''

Example 73: Ligeti, Etude No. 1, the ending.

In Example 74, several instances of the thumb on black keys in the left hand are highlighted, as observed in the manuscript.

Handwritten musical score for Etude No. 1 by György Ligeti. The score is written on two systems of grand staff notation. It features extensive red annotations, including fingerings (e.g., 1, 2, 3, 4, 5, 13, 14, 15, 24) and dynamic markings. A circled 'X' contains the instruction: "Dynamische Balance: die rechte Hand etwas kräftiger spielen als die linke, so dass die akzentuierten Akkorde in beiden Händen gleich laut klingen (bis Ende des Stückes)". Below the second system, there is a note: "allmählich etwas mehr Pedal (doch stets sparsam)".

Example 74: Etude No.1, György Ligeti Collection, Paul Sacher Foundation, Basel.

In Ligeti's Etude No. 7, bar 12, the use of fingers 1 and 5 in the left hand is applicable, as highlighted in the example below.

Printed musical score for Etude No. 7 by György Ligeti, bar 12. The score is in 4/4 time and features a complex rhythmic pattern. The left hand part is marked with dynamic changes: *mp poco cresc.*, *mf sub. > pp*, and *p dolce*. The instruction *una corda* is present, and *tre corde* is indicated at the end of the bar. The left hand fingering for the final notes is highlighted in pink: 5 3 2 1 5 3 1.

Example 75: Ligeti, Etude No. 7, bar 12.

At first, using the fifth finger on E flat preceded by the thumb on the D flat may seem unusual. However, after several attempts to finger this passage, I have realised that the fifth finger crossed over the thumb proves to be the most convenient fingering. With the single hand position remaining calm and supple, it facilitates the connection to the interval of a third, B flat and D flat, played with the second finger and the thumb, respectively.

The next example of the crossing over fingering technique is the first movement of Ligeti's Concerto, bar 118 in the left hand as shown in Example 76. There are two ways to finger this passage as shown below. In both cases, the crossing finger technique is involved, forming a fingering pattern for the ascending passage. I have indicated the fingerings from the last semiquaver of bar 117 as these four notes act as connecting fingerings. In (a), the crossing over technique occurs between A sharp- C sharp with fingers 1-4. It forms a fingering pattern 1-4-3-2 which repeats three times in this ascending passage. In (b), the crossing over starts on G sharp-A sharp, fingers 1-4-3-2 repeats three times but on the last four semiquavers the fifth finger crosses over the thumb making the final two notes with fingers 3-2. These two versions are based on pattern fingerings and can be executed according to the individual comfort and preference of a performer.

The image shows a musical score for the left hand of Ligeti's Piano Concerto, first movement, bars 117-118. The score is written in bass clef with a key signature of three sharps (F#, C#, G#). It consists of two systems of staves. The first system (bar 117) shows five semiquaver notes with *sfz* markings. The second system (bar 118) shows a sequence of notes with dynamic markings *dim.* and *pp*. Two fingering options are indicated: (a) and (b). Option (a) shows a pattern of 5-4-3 for the first three notes of the ascending passage, followed by 2-1-4-3-2-1-4-3-2-1-3-2. Option (b) shows a pattern of 1-5-3-2 for the first three notes, followed by 1-4-3-2-1-4-3-2-1-4-3-2-1-5-3-2. The word "pattern" is written under the second part of both options.

Example 76: Ligeti, Piano Concerto, first movement, bar 117-118.

In the descending run of Chopin's Etude Op. 10, No. 5, the fingering pattern 1–4–3–2 as seen in the previous example (a), is reversed in the right hand.

65

8

5 3 2 1 4 3 2 1 4 3 2 1 2

\* *delicatis.* *smorz.*

4 1

\* Red.

Example 77: Chopin, Etude Op. 10, No. 5, bar 65.

### 3.7 CROSSING THE LONGER FINGERS OVER ONE ANOTHER

One of the most relevant examples of this fingering technique is found in Chopin's Etude Op. 10, No. 2. The Etude presents numerous technical challenges, particularly concerning the crossing of the longer fingers. As can be seen in Example 78, Chopin's printed fingering emphasises finger crossings in the right hand, such as finger 4 over 3, 5 over 3, 5 over 4, *et cetera*. Given that the finger muscles primarily work in the upper part of the hand with weaker fingers 4-5 and stronger finger 3, executing the Etude becomes exceedingly difficult in terms of achieving evenness of tone and finger control.

The image shows the opening of Chopin's Etude Op. 10, No. 2. The score is in 2/4 time, marked 'Allegro' with a tempo of 144 beats per minute. The tempo is indicated by a quarter note followed by '= 144'. The performance instruction is 'sempre legato'. The piece begins with a piano (*p*) dynamic. The right hand starts with a quarter note G4 (finger 4), followed by a quarter note A4 (finger 3), a quarter note B4 (finger 4), and a quarter note C5 (finger 5). The left hand starts with a quarter note G3 (finger 1), followed by a quarter note F3 (finger 2), a quarter note E3 (finger 1), and a quarter note D3 (finger 2). The score includes various fingerings for both hands, such as 4 3 4 5 in the right hand and 1 2 1 2 in the left hand. A crescendo (*cresc.*) is marked over the first four measures. The piece is in D minor, indicated by two flats in the key signature.

Example 78: Chopin, Etude Op. 10, No. 2, the opening.

In Ligeti's Etude No. 9, there are several instances of longer finger crossings on chromatic double notes in the left hand (bars 36–39), closely resembling the chromatically descending tritones in Chopin's Etude Op. 10, No. 3 (bars 38–41). Examples 79 and 80 illustrate these similarities.

Musical score for Ligeti's Etude No. 9, bars 36-39. The score shows a complex, chromatic melody in the right hand and a more rhythmic bass line in the left hand. The left hand features a prominent crossing-finger technique, indicated by pink highlights under the notes and corresponding fingerings (5, 3, 4, 5, 4, 5, 4, 5, 3, 4, 3). Dynamics include *mp*, *ppp*, and *p una corda*.

Example 79: Ligeti, Etude No. 9, bars 36–39.

The crossing finger technique begins from the sixth quaver in the left hand in bar 36, alternating between fingers 5–3–4–5–4–5–4–5–3–4–3, *et cetera*. The technical challenge lies in maintaining evenness of tone across all crossed fingers.

Musical score for Chopin's Etude Op. 10, No. 3, bars 38-41. The score is in a major key and features a complex, chromatic melody in the right hand and a more rhythmic bass line in the left hand. The left hand features a prominent crossing-over technique, indicated by pink highlights under the notes and corresponding fingerings. Dynamics include *cresc.* and *p*.

Example 80: Chopin, Etude Op. 10, No. 3, bars 38–41, Peters Edition.

The crossing over technique is essential in Ligeti's final Etude No. 18. Below is an example of the Etude where crossed fingers are highlighted.

Example 81: Ligeti, Etude No. 18, page 23.

There are some passages in Ligeti Etude No. 1 where crossing the longer fingers over one another can be applied. The example below is the final line of page 7. There are two ways of fingering this passage. In (a), fingers 3–4–3–4 are used, with finger 4 crossing over finger 3 as highlighted. In (b), fingers 3–4–5–3 are applied and finger 5 crosses over finger 3. While both of these versions are appropriate, I think that the fingering in (b) is more suitable for the hand since it gives the wrist more time to rest after playing finger 5.



Example 82: Ligeti, Etude No. 1, page 7, final line.

### 3.8 DOUBLE THUMBING

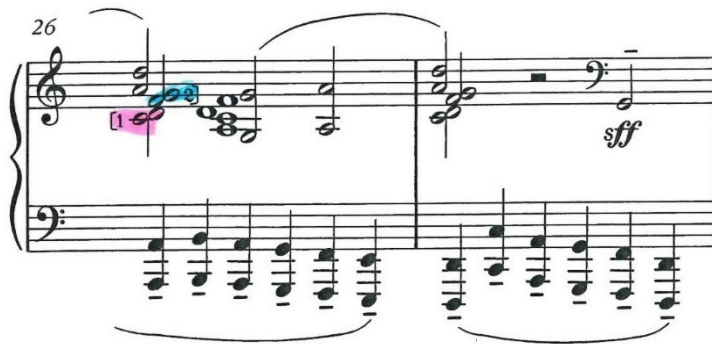
Double thumbing is a fingering technique that allows pianists to take two adjacent white or black keys with the thumb. This fingering arises from a natural hand position. The technique was most widely used in Romantic and Impressionistic music but there is no solid evidence to suggest when exactly it first appeared. However, Ravel was a great advocate for this technique in his music. Described by Ravel as ‘strangler’s thumbs (Howat, 2009, p. 298), the technique appeared in chords for making stretches easier to execute, achieving lateral flexibility and maintaining a calm hand position, as well as showing the natural weight of the thumb and the sonority it may produce. Double thumbing can be divided into two categories. The first category is to use it for the chordal stretches for preventing hand tightening and allowing the hand to reach larger chords. The second category is to help maintain lateral wrist flexibility in rapid chromatic glissandi and achieve the smoothest legato. Incidentally, there are two ways of notating double thumbing in the scores; either by finger 1 referring for two notes, or by writing finger 1 twice under the specific key. The two versions can be used interchangeably, as shown in the examples below.

The example of the double thumbing employed to stretch a chord is illustrated in Chopin’s Etude Op. 10 No. 4 bar 4, in Example 83. Here, two adjacent black keys on the final crotchet beat in the right hand are the only viable solution for playing a large chord that requires hand extension. Similar chordal stretches can also be found in bars 11 and 13 in Chopin’s *Polonaise* No.6, Op. 53.



Example 83: Chopin, Etude Op. 10, No. 4, bar 4.

There are a number of examples of double thumb technique in Debussy's music. In bar 26 of *La Cathédral Engloutie*, one particularly notable example is the simultaneous use of double thumb and double index as illustrated in Example 84. Perhaps Debussy encouraged performers not to arpeggiate the chord.



Example 84: Debussy, *La Cathédral Engloutie*, bar 26.

The other example of the use of double thumbing can be seen in Ravel's *Valses nobles* (bars 1-4, right hand), Debussy's *L'isle joyeuse* (bars 237-245 right hand), *et cetera*.

The Second category is to help maintain lateral wrist flexibility in rapid chromatic slides and achieve the smoothest legato. A particularly extended example is *Scarbo* by Ravel shown in Example 85, where double thumbing is employed for chromatic slides, and it interacts with

other fingering combinations. It is continued for 25 bars in the right hand continuously. The whole extract can be found in the Durand edition (1909) pp. 37–38.

Example 85: Ravel, *Scarbo* from *Gaspard de la nuit*.

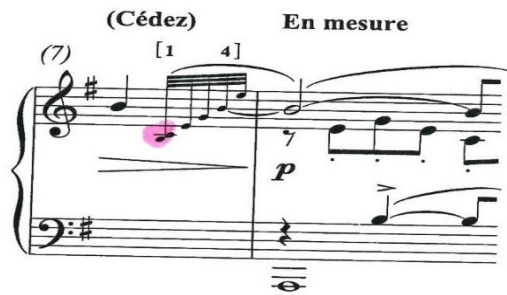
Another example is Chopin Ballade No. 4, Bar 72, the right hand. Chopin applies double-thumb on the fourth semiquaver chord, B–C so as to maintain lateral wrist action in the legato semiquaver passage as can be seen in Example 86.

Example 86: Chopin, Ballade No. 4 bar 72.

Additionally, a left hand division with double thumbing is performed in the right-hand accompaniment of Chopin's Nocturn, Op. 62, No. 2, bar 43, as illustrated in Example 87.

Example 87: Chopin, Nocturn Op 62. No. 2, bars 42.

An example of double thumbing in a legato passage present in Ravel *Pavane pour une infante défunte* at end of bar 7, right hand (Example 88). The fingering is editorial, and it is taken from Roy Howat's *The Art of French Piano Music*, 2009.



Example 88: Ravel, *Pavane pour une infante défunte*, the opening.

The double thumb fingering was extensively used in Ligeti's late piano works. One of the rare examples of Ligeti's thought on fingering was found in the sketches of Etude No. 1 regarding the thumb used on two notes simultaneously, i.e., double thumbing, as illustrated at the bottom of Example 89. All fingering markings in this example are by Ligeti. The composer states:

I have already experimented with other systems of fingering for this and the last page, for example using other fingers besides the thumb to play two notes simultaneously. But these methods are not reliable.

4

*gva*

*gva*

*gva*

*gva*

⊗ Dynamische Balance: die rechte Hand etwas kräftiger spielen als die linke, so dass die akzentuierten Akkorde in beiden Händen gleich laut klingen (bis Ende des Stückes)

⊕ Allmähliches crescendo (bis Ende): die Akzente werden allmählich ff, dann fff (mit stets stärkerer rechter Hand), die Achtel-Figuren allmählich mp, dann mf.

(I have already experimented with other systems of fingering for this and the last page - for example, using other fingers besides the thumb to play ~~two~~ notes simultaneously. But these methods are not reliable.)

Example 89: Etude No. 1, György Ligeti Collection, Paul Sacher Foundation, Basel.

The opening bar in the manuscript corresponds to the second line on page 11 of Etude No. 1 in the Schott edition.

Regarding Ligeti's comment at the bottom of Example 89, there is no evidence of the fingering methods; however, it is safe to assume that the double thumbing played a significant role in his piano writing. In some ways, it is the key for maintaining the flexibility of the wrist in the rapid passages. In Etude No. 1, in the first bar of page 11, while this fingering creates a flawless legato with the notes that follow, fingers 2 and 3 in the right hand, this technique also serves as a model of a tranquil hand position. The fingering indication 2-3 on B-C are by Ligeti found in the Facsimile Edition of Etudes Book 1. Furthermore, the dotted crotchet note needs to be played with double thumbing in order to allow the chord to be held for its full length. The ascending quavers then lead the double thumb chord on the subsequent bar's downbeat, effortlessly connecting with fingers 2-3 on C-D, respectively.

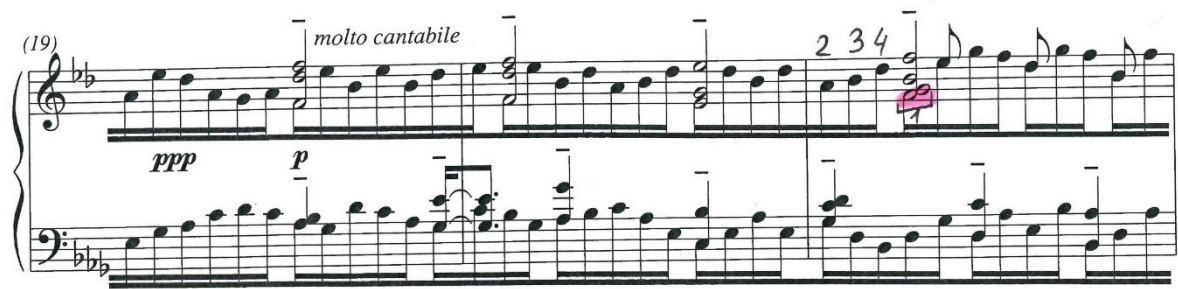
For legibility purposes a version from Schott edition is illustrated below.

The image shows a musical score for the first bar of Ligeti's Etude No. 1. It consists of two staves: a treble clef staff for the right hand and a bass clef staff for the left hand. The right hand begins with a dotted crotchet note on B4, followed by a quarter note on C5, and then a series of eighth notes: C5, D5, E5, F5, G5, A5, B5. The left hand begins with a dotted crotchet note on B3, followed by a quarter note on C4, and then a series of eighth notes: C4, D4, E4, F4, G4, A4, B4. The score includes dynamic markings (sfff, mf, f, p, sim.) and fingering indications (3 2, 5 3 2 3 4, 5 2 3). The notes B4 and C5 in the right hand and B3 and C4 in the left hand are highlighted in pink.

Example 90: Ligeti, Etude No. 1, page 11, first bar.

In Etude No. 7 bar 21, double thumbing in the minim chord in the right hand allows the three preceding notes to be well-connected with the chord as shown in Example 91.

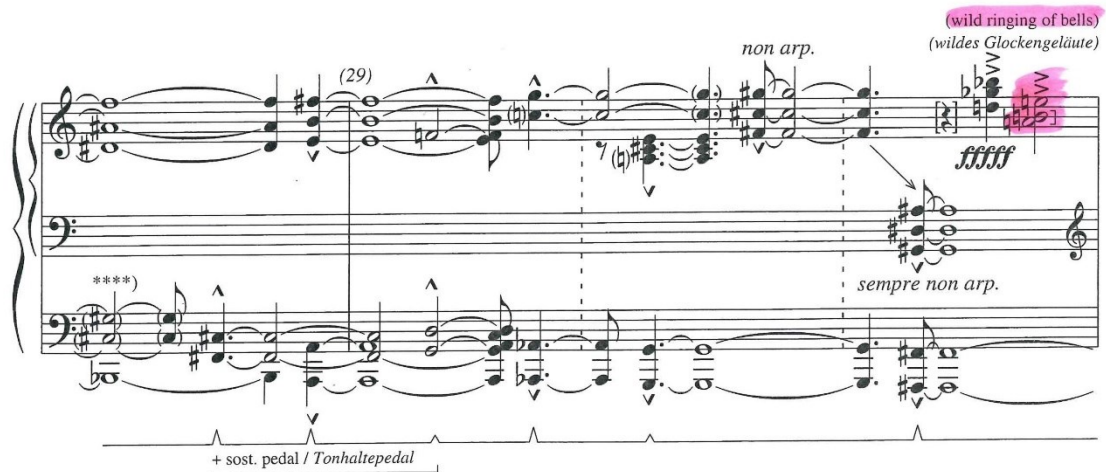




Example 91: Ligeti, Etude No 7, bar 21.

In the following example of Etude No. 13, Example 92, Ligeti indicated double thumbing on the last minim chord A–B in the right hand. It is the case where pianist’s five fingers can easily reach the full chord with fingers 5–2–1 without the need of the double thumbing.

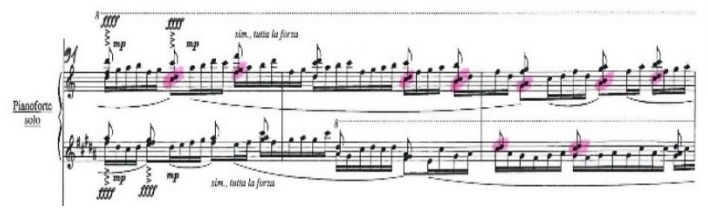
However, considering the powerful character of this section, the natural weight of the thumb creates the sonority of ‘wild ringing of bells,’ as marked in the scores by Ligeti, and the chord must be taken by the double thumbing on A–B as indicated by the composer.



Example 92: Ligeti, Etude No. 13, bar 29.

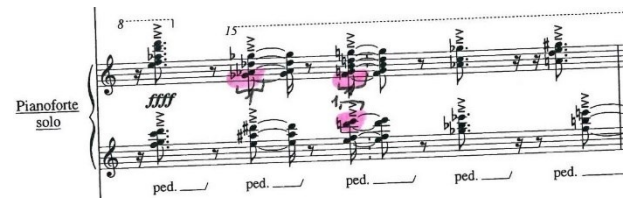
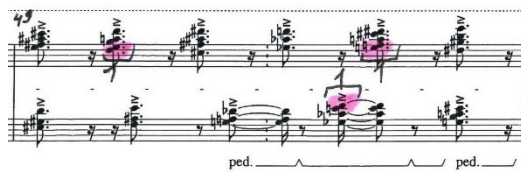
This fingering pattern recurs from bars 30–32 on the most dramatic climax of the piece, including the constant use of the double thumbing on the four-note chord E-F-B flat-D flat in the right hand as illustrated in Example 93.





Example 94: Ligeti, Piano Concerto, first movement, bars 89–93.

For the execution of short and accented chords, double thumbing will be necessary in the fifth movement of the Concerto, bars 49–50 in both hands as indicated in Example 95.



Example 95: Ligeti, Piano Concerto, fifth movement, bars 49–50.

In the third movement of Ligeti Trio, bar 97 (Example 96), double thumb in the left hand works well for the second crotchet chord A–B as the third finger is held on the preceding tied F.



Example 96: Ligeti, Horn Trio, third movement, bar 97.

For bars 132–133 of the same movement, the left hand will require double thumbing.

The thumb weight in the left hand contributes to the chord's continued richness.

(senza allarg.)

Example 97: Ligeti, Horn Trio, third movement, bars 132–133.

The execution of double thumbing will be necessary on the powerful, bell-like chords in bars 52–53 of the fourth movement of the Trio as shown in Example 98.

agitato

*ff* (poco a poco cresc. bis Takt 76 / until bar 76)

*più f* (poco a poco cresc. bis Takt 76 / until bar 76)

*f*

Example 98: Ligeti, Horn Trio, fourth movement, bars 52–53.

In bar 68 of the same movement as highlighted in Example 99, the use of the triple thumbing can be seen in both hands simultaneously (C–D–E in the right hand and G–A–B in the left hand). These chords are not clusters, and the precision of the written keys must be observed.

Example 99: Ligeti, Horn Trio, fourth movement, piano part, bar 68.

The use of double thumbing assures flexibility and technical security in the fast-running descending quavers in Etude No. 9. The example shown below are bars 106–107 of Etude No. 9. The thumb in the left-hand acts as a pivot without changing its position, helping to maintain hand serenity and providing a relaxing point for the left hand in the swiftly moving quaver passage.

Example 100: Ligeti, Etude No. 9, bars 106–107.

The double thumbing can be employed in Etude No. 11 as highlighted in Example 101. It provides a smooth legato line and a lateral wrist flexibility. The Etude requires a delicate touch.

The image shows a musical score for Ligeti's Etude No. 11, specifically bars 31-34. The score is written for piano and is in G major (one sharp) and 3/4 time. It consists of three systems of music. The first system covers bars 30-31, the second covers bars 32-33, and the third covers bar 34. The score includes various dynamic markings such as *pp*, *p*, *f*, and *pp*, and performance instructions like *non arp.*, *cresc. poco a poco*, and *poco rall., più rall.*. The double thumbing technique is highlighted in pink in the original image, showing the thumb playing two notes simultaneously. The score also features several slurs and accents, and the key signature changes to G minor (three flats) at the end of bar 34.

Example 101: Ligeti, Etude No. 11, bars, 31–34.

In the example below, Etude No. 15, bars 16–18 the use of double thumb facilitates the execution of the leaps, giving them more bouncy character. As the second finger is already used on the preceding note, there is no alternative way but to use one finger on two notes. Double thumb helps here to emphasise the *sforzandos*, i.e., a sudden or marked emphasis, with the weight of the thumb.



Example 102: Ligeti, Etude No. 15, bars 16–18.

Double thumbing acts as an important device for Etude No. 17 (Example 103). In the left-hand long quaver chain of page 20, the interaction with other intervals makes it necessary to do double thumbing, which, in turn, facilitates the execution of the rapid quavers.



Example 103: Ligeti, Etude No. 17, page 20.

In closing this section, I analysed the use of double thumbing, a crucial finger technique used by Chopin, Debussy, and Ravel, and which was later prominently incorporated into Ligeti's piano compositions. This fingering results from a natural hand position in which the hands

remain tranquil. Double thumb substantially aids the execution of certain micropolyphonic recursive passages in Ligeti's exceedingly difficult Piano Etudes, such as Etude No. 9 which is built completely on quickly looping quavers.



## 4 CONCLUSION

This research examined the role of dexterity in Ligeti's late piano works including his eighteen *Piano Etudes*, *The Horn Trio* and *Piano Concerto*.

There is already exhaustive research on the complex rhythmic structure and irregular rhythmic layers in Ligeti's piano etudes; however, the role of dexterity, technical demand and the pianistic nuances have not been covered by previous research, neither by musicologists nor by pianists. A physical sense of the keys under the fingers was a chief component making Ligeti's technically challenging piano works such as *Etudes* playable and well-suited for the pianistic hand. Although Ligeti had a natural feel for the piano, he did not explicitly address pianistic issues. Even fingering indications are rare in his entire piano output. Despite this, pianism plays a major role in Ligeti's piano writing, and as a performer of all his *Etudes*, his *The Horn Trio* and *Concerto*, I felt that the pianistic issues had to be addressed as thoroughly as the rhythmic complexity.

As previously stated, this thesis was informed by three fundamental approaches: historical reference, evidence from Ligeti's manuscripts, and my own solutions to the challenges presented by specific works. These approaches contributed to the re-creation of the knowledge required to judge the aesthetics and pianistic style of Ligeti's pieces, as well as to the establishment of a pianistic link between Ligeti's piano tradition and the broader historical keyboard legacy. Through these approaches, I concluded that despite the extreme complexity and uniqueness of Ligeti's late piano works, these compositions still engage intuitively with the pianistic hand and maintain continuity with the broader pianistic history. Ligeti's underlying use of traditional approaches for finger dexterity makes the works not only

playable, but also musically expressive. Ligeti achieved the musical expression through the concept of the pianistic hand. In sum, connections are always discernible between the hand, physical construction of the instrument and compositions.

Since there are not many printed fingerings for the Etudes, Trio and Concerto, I am hoping that my research, which includes a careful analysis of the fingering, will fulfil pedagogical purposes and make it easier for pianists to learn these pieces. The current work on fingering analysis will facilitate the execution of certain passages while also easing technical and interpretative problems. I hope that my work will create new and inspiring interactions with Ligeti's music by merging my experience with a historically informed performance practice.

Suggestions for further research could include providing an in-depth performance commentary and editorial fingering in the Etudes, Trio and Concerto. Although Ligeti's works, as a whole, have few fingering indications, the copies of some of his Etudes held at the Paul Sacher foundation show some original fingerings written by him. Further to my investigations about including these fingering indications, it has been shared by the Paul Sacher Foundation that there are plans to include these fingerings in the Schott edition, but this is not yet confirmed at the time of writing.

Additionally, further research on a more detailed level can be conducted for each of the Etudes. In particular, this space did not allow me to consider Ligeti's Etude No. 6 in detail; it compares intriguingly with Liszt's *La Campanella*.

My thesis coincides with the centenary of Ligeti's birth, which, I hope, makes it especially relevant at this time.

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## 6 APPENDIX

### **Katrin Klose: Piano Concerto with orchestra**

I. *Ciaconna*

II. *Pairs-Falling stars*

III. *The Angel sleeps*

Katrin Klose's (1990) Piano Concerto was written for my DPerf Development Project in 2021–2022.

I premiered the piece on the 26<sup>th</sup> April 2022 with Red Note Ensemble under the baton of Alvin Ho as part of the RCS Plug Festival.

### **Performance Commentary**

Abbreviations

*m.d.* = *mano destra* (right hand)

*m.s.* = *mano sinistra* (left hand)

The present piano part edition includes performing indications that have been discussed and agreed with the composer. These consist of fingering, pedalling, articulation, expressive markings, performance and other interpretative advice.

All fingering and pedalling are editorial unless otherwise specified.

All editorial expressive markings as well as performance instructions and articulation are shown in square brackets [].

Performance directions such as *senza accelerando*, *senza rit.* are based on natural tendencies that have been observed during the rehearsal process and have been agreed with the composer.

### **Notational revisions**

Bar 69. 15ma octave sign refers to both hands. In the second quaver, and in all analogous passages, each note of the sustained chord has to be tied over from the preceding upward run, whose notes should all be held down and tied over.

Bar 70. See comment to bar 69.

Bar 127. The third chord should be played as one continuous arpeggiation, the hands not synchronised with each other. This applies to all analogous arpeggios in this movement.

Bar 149. Originally, this passage was written with notes 1–3 and 7–9 down-stemmed to indicate *m.s.*, and notes 4–6 up-stemmed to indicate *m.d.* Over the course of rehearsal, we agreed that it would be more practical to start the passage with *m.d.* The beaming was accordingly adjusted.

Bars 322–333. It is important to observe the melodic structure that the pitch class of the top note in each chord recurs low in the texture of the following chord. Hand distribution (*m.s.* and *m.d.*) in bars 322–333 is editorial. This passage was originally notated on two staves, as shown below; the present score re-notates it on four staves to facilitate legibility.

sempre Arpeggio

ff

Ped \*

16

325

Piano

f

mf

mp

Ped \*

2<sup>nd</sup> movement. Pedal marks from bar 290 onwards are by the composer.

3<sup>rd</sup> movement. Pedal marks from bar 375 onwards are by the composer.

## **Fingering observations in Klose's Piano Concerto**

The subsequent section outlines points of contact relating to fingering and dexterity issues, the focus of my thesis, centred here on Klose's Piano Concerto.

### **Movement 1**

Bars 80–81. The fingering features the use of the thumb and little finger on black keys. The use of the thumb also forms a five-finger position.

Bar 93. The right-hand ascending passage closely resembles the fingering related to the passing of the thumb incorporating many accidentals within a small passage range.

### **Movement 2**

Bars 131–136. The double-thumb technique could be employed for the left-hand clusters encompassing the G sharp–F Sharp range.

Bar 303. Finger 3 on A flat, preceded by Finger 1 on G flat in the right hand, highlights the omission of a finger from the stepwise successions, in which two neighbouring notes, G flat and A flat, are played with fingers 1–3 instead of 1–2.

Bars 296, 303, 310, 313, and 316. The fingering features the employment of a pattern fingering in which the finger numerals may correspond to the rhythmic groupings of the notes.

### **Movement 3**

Bars 414–415, 419–420, and 427. The fingering demonstrates the use of finger substitution on the same note.





Solo piano

# Piano Concerto I. Ciaccona

Katrin Klose (\*1990)

calm ♩ = 60

musical score for measures 1-9. Treble clef, 3/4 time. Dynamics: *mf*. Performance instructions: "rotate glass, very high register" with a glass icon and dashed arrow above the staff. Measure numbers 7 and 9 are indicated.

musical score for measures 10-19. Treble clef, 3/4 time. Dynamics: *f*. Performance instructions: "stroke lightbulb over strings, high register" with a lightbulb icon and "rotate glass, high register" with a glass icon and dashed arrow. Measure numbers 10, 13, 16, and 19 are indicated.

musical score for measures 21-19. Treble clef, 3/4 time. Dynamics: *f*. Performance instruction: "stroke lightbulb over strings, high register" with a lightbulb icon. Section markers B, C, and 16 are present. Measure numbers 21, 24, 27, 16, and 19 are indicated.

musical score for measures 69-71. Treble clef, 3/4 time. Dynamics: *pp*, *p*, *pp*. Performance instruction: "[sempre legato] always hold keys". Measure numbers 69, 70, and 71 are indicated.

musical score for measures 72-75. Treble clef, 3/4 time. Measure numbers 72, 73, 74, and 75 are indicated.

2

(15)

73

Musical score for measures 73-74. The right hand features a melodic line with a trill on the first measure and a triplet of eighth notes in the second measure. The left hand provides a steady accompaniment of eighth notes. A fermata is placed over the final chord of the system.

(15)

75

Musical score for measures 75-76. The right hand continues the melodic line with a trill and a triplet. The left hand accompaniment remains consistent. A fermata is placed over the final chord of the system.

(15)

76

E

Musical score for measures 77-78. The right hand features a melodic line with a trill and a triplet. The left hand accompaniment remains consistent. A fermata is placed over the final chord of the system.

(15)

77

Musical score for measures 79-80. The right hand continues the melodic line with a trill and a triplet. The left hand accompaniment remains consistent. A fermata is placed over the final chord of the system.

(15)

78

Musical score for measures 81-82. The right hand features a melodic line with a trill and a triplet. The left hand accompaniment remains consistent. A fermata is placed over the final chord of the system.

(15)

80

Musical score for measures 83-84. The right hand continues the melodic line with a trill and a triplet. The left hand accompaniment remains consistent. A fermata is placed over the final chord of the system. The dynamic marking *mp* is present at the end of the system.

82 *[m. d. sopra]* *swa*

83

84

85 **F**

87

88

4

89

90

92

*p*

*ppp*

*Ped.*

\*

## II Pairs - Falling stars

rhythmical, lively ♩ = 120 [sempre staccato, secco, like a marimba]

107

112

*ff*

*ppp*

*ff*

*p*

*ff*

*Ped.\* simile*

*chromatic cluster*

[very short pedal]

H

115 *ff* *pp* *mf*

119 *p* *mf*  
Ped\*Ped\*Ped. \*Ped\*Ped.\*

124 *p* *mf*  
[tenuto simile] *f* *d* *mf*

127 *mf*

131 *ff* *pp cresc.* cluster, black keys white  
[no pedal] *ff*  
black white black

135 Ped\* Ped\* Ped\* Ped\* Ped\* Ped\*

Detailed description: This page of a musical score contains six systems of piano music. The first system (measures 115-118) features a forte (*ff*) dynamic in the bass and piano (*pp*) in the treble, with a mezzo-forte (*mf*) dynamic in the bass for the remainder. The second system (measures 119-123) includes a piano (*p*) dynamic in the bass and mezzo-forte (*mf*) in the treble, with a 'Ped\*Ped\*Ped.' marking. The third system (measures 124-126) shows a piano (*p*) dynamic in the bass and mezzo-forte (*mf*) in the treble, with a '[tenuto simile]' marking and a forte (*f*) dynamic in the bass. The fourth system (measures 127-130) continues with mezzo-forte (*mf*) dynamics. The fifth system (measures 131-134) is characterized by a fortissimo (*ff*) dynamic and a 'cluster, black keys' marking, with a 'white' marking in the treble and a '[no pedal]' marking in the bass. The sixth system (measures 135-138) features a fortissimo (*fff*) dynamic and a 'black white black' marking, with 'Ped\* Ped\* Ped\* Ped\* Ped\* Ped\*' markings below the bass line.

139 **I**

pp fp

right hand left hand

[no pedal]

143

mf p

right hand left hand

8<sup>va</sup> Ped\* Ped. \* Ped\* Ped. \*

fp mf

148

fp mf

right hand left hand

[senza accelerando]

150

p

right hand left hand right hand

8<sup>va</sup> 5

153

p f

right hand left hand right hand

158 **J** right hand left hand

*p* *ff*

161 right hand left hand

*p* *ff*

163 right hand left hand

*p* *ff*

167 **K** [secco] chromatic cluster cluster, black keys

*p* *f*

173 white keys chromatic black keys chromatic

*p* *f*



176 white keys

180

184 black keys [senza rit.]

*fff* *pp*

[no pedal]

189 L cluster, arm, black keys cluster, arm, white keys

*f* *f*

*ped.* \**ped.*

198 cluster, arm, black keys

*ff* *ff*

\**ped.* \**ped.*

203

cluster, arm,  
white keys

*fff*

\* Ped. \*

208 **M**

cluster, arm,  
black keys

cluster, arm,  
white keys

*fff*

Ped.

214

\* Ped.

221

**N**

*f*

*pp*

\* Ped.

228

*f*

*pp*

\* Ped.

233

*f*

239

*f*

242

*fff*

*Red.* \*

chromatic cluster, both arms

246 (65)

*fff*

*Red.*

chromatic cluster, both arms

254 poco a poco accelerando

*fff*

*fff*

no pedal change

259

15va

*p*

\* Ped. \* [sempre con ped.]

**P** [sempre tenuto]

265 (15)

268 (8)

270

8va

*mf*

274 (8)

277

**Q**

280

ff

Detailed description: This system contains measures 280 through 283. It features a grand staff with treble and bass clefs. The music is characterized by dense, sustained chords and arpeggiated textures. A dynamic marking of *ff* (fortissimo) is present at the end of the system.

284

*8va*

Detailed description: This system contains measures 284 through 286. The notation includes a *8va* (octave up) marking. The music continues with complex chordal structures and arpeggios.

287

*f*

Detailed description: This system contains measures 287 through 290. It features a dynamic marking of *f* (forte). The music concludes with a double bar line and repeat dots.

calmer, warm sound,  
infinite exhalation  $\text{♩} = 90$   
[sempre legato]

**R** *8va*

290

*ff*

Detailed description: This system contains measures 290 through 292. It begins with a **R** (ritardando) marking and an *8va* marking. The music is marked *ff* and features intricate arpeggiated patterns with fingerings (1-4) and accents. A *Red.* (ritardando) marking is at the bottom.

293

[tranquillo]

Detailed description: This system contains measures 293 through 296. The music is marked [tranquillo] and features complex arpeggiated textures with various fingerings and accents.

296 *p* *[un poco agitato]* *8<sup>va</sup>* *21* *piu ff*

298 *Red.*

300

302 *[tranquillo]* *p* *8<sup>va</sup>* *21* *[un poco agitato]*

304 *fff* *Red.*

14

306

308

[tranquillo]

310

21

8<sup>va</sup>

*p*

[un poco agitato]

*mf*

Ped.

312

21

*pp*

314 *mp*

316 *pp* *mf*

318 *pp* *f* *p* *f*

320 *f* *p* *pp*



16 sempre Arpeggio

322

1) g) *ff*

*f*

Ped. \* Ped. \* Ped. \* Ped. \* Ped. \*

327

*mf*

Ped. \* Ped. \* Ped. \* Ped. \*

331

*mp*

Ped. \* Ped. \* Ped. \*

### III The angel sleeps

334 **Andante** ♩ = 80

**11**

**11**

*p*

**U**

347

349

351

The image shows a page of musical notation for a piano piece. It consists of four systems of music, each with a grand staff (treble and bass clefs). The first system starts at measure 334 and includes a tempo marking 'Andante' with a quarter note equal to 80 beats per minute. There are two measures of whole rests in both staves, followed by a melodic line in the right hand and a bass line in the left hand. A dynamic marking 'p' (piano) is present. A box labeled 'U' is above the first measure of the right hand. The second system starts at measure 347 and features complex rhythmic patterns with many sixteenth and thirty-second notes. The third system starts at measure 349 and continues the intricate texture. The fourth system starts at measure 351 and concludes the page. Various fingering numbers (1-5) and articulation marks like slurs and accents are used throughout. The key signature has two flats (B-flat and E-flat), and the time signature is 3/4.

18 353 *Andante* *Andante* **V**

355 *Andante*

357 *Andante* *f*

359 *mp* *Andante* *Andante*

361 *mf*

363 *p*

365

367 **W** *f*

369

Musical score for measures 369-370. The piece is in 3/4 time with a key signature of two flats. Measure 369 features a triplet of eighth notes in the right hand and a sixteenth-note triplet in the left hand. Measure 370 continues with similar rhythmic patterns, including a descending eighth-note line in the right hand and a sixteenth-note triplet in the left hand. Fingerings are indicated with numbers 1-5.

371

Musical score for measures 371-372. The piece is in 3/4 time with a key signature of two flats. Measure 371 features a triplet of eighth notes in the right hand and a sixteenth-note triplet in the left hand. Measure 372 continues with similar rhythmic patterns, including a descending eighth-note line in the right hand and a sixteenth-note triplet in the left hand. Fingerings are indicated with numbers 1-5.

373 rit.

Musical score for measures 373-374. The piece is in 3/4 time with a key signature of two flats. Measure 373 is marked *rit.* and *p*. It features a triplet of eighth notes in the right hand and a sixteenth-note triplet in the left hand. Measure 374 continues with similar rhythmic patterns, including a descending eighth-note line in the right hand and a sixteenth-note triplet in the left hand. Fingerings are indicated with numbers 1-5.

375  quiet and even, ♩ = 50

[bell-like]

*pp dolce*, [ma senore]

*p*

*pp*

h) *Ped.* [sempre tenuto] \* *Ped.* \* *Ped.* \* *Ped.*

Musical score for measures 375-378. The piece is in 4/4 time with a key signature of two flats. Measure 375 is marked *pp dolce*, [ma senore]. It features a bell-like sound effect in the right hand and a sixteenth-note triplet in the left hand. Measure 376 continues with similar rhythmic patterns, including a bell-like sound effect in the right hand and a sixteenth-note triplet in the left hand. Measure 377 features a bell-like sound effect in the right hand and a sixteenth-note triplet in the left hand. Measure 378 continues with similar rhythmic patterns, including a bell-like sound effect in the right hand and a sixteenth-note triplet in the left hand. Fingerings are indicated with numbers 1-5.

381

Musical score for measures 381-386. The system consists of two staves. The upper staff is in bass clef and contains a melodic line with slurs and accents. The lower staff is in bass clef and contains a rhythmic accompaniment of eighth notes. Pedal markings (\*Ped.) are present at the beginning of measures 381, 383, 385, and 386.

387

Musical score for measures 387-392. The system consists of two staves. The upper staff is in bass clef and contains a melodic line with slurs and accents. The lower staff is in bass clef and contains a rhythmic accompaniment of eighth notes. Pedal markings (\*Ped.) are present at the beginning of measures 388, 390, and 392. Dynamic markings include *mf* and *p*. A box labeled 'Y' is above measure 389.

393

Musical score for measures 393-398. The system consists of two staves. The upper staff is in bass clef and contains a melodic line with slurs and accents. The lower staff is in bass clef and contains a rhythmic accompaniment of eighth notes. Pedal markings (\*Ped.) are present at the beginning of measures 393, 395, 397, and 398. Dynamic markings include *mf* and *p*.

399

Musical score for measures 399-404. The system consists of two staves. The upper staff is in treble clef and contains a melodic line with slurs and accents. The lower staff is in bass clef and contains a rhythmic accompaniment of eighth notes. Pedal markings (\*Ped.) are present at the beginning of measures 399, 401, 403, and 404. Dynamic markings include *f* and *p*.

405

Musical score for measures 405-410. The system consists of two staves. The upper staff is in treble clef and contains a melodic line with slurs and accents. The lower staff is in bass clef and contains a rhythmic accompaniment of eighth notes. Pedal markings (\*Ped.) are present at the beginning of measures 405, 407, and 410. Dynamic markings include *ff*. The tempo marking *poco rit.* is above measure 405. A dashed line labeled '8va' is above measure 407.

22

410 **Z** **Andante** ♩ = 80  
very soft and tender, like a lullaby [*semplice*]

*p dolce*  
*p dolce*  
Ped. \* Ped. \* Ped. \* [Ped. simile]

416

1 1-2

422

*f* *mp*  
3 1-2

428

[bell-like]  
*p* *p*  
Ped.

434

fading away completely  
Ped. \*