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Aspects of melodic and rhythmical textures in György Ligeti's micro and macro polyphony

MEANS OF TEXTURE ORGANIZATION BY TWENTIETH-CENTURY COMPOSERS

Every great composer of the past and present has developed a personal idiom, a pool of characteristics which are evident in their works and which create their compositional identity. These elements of identity – more or less consciously formed by each composer – create an impression of a composer's self on those who perceive each work. We often listen to a particular piece and can correctly guess it is by Bach, Mozart, Beethoven, Messiaen or Stravinsky. This compositional identity is consistently present, thus making one's works identifiable and connected to their creator. It may also be common for the majority of composers, performers and listeners to agree that, for a composer, finding this personal idiom, their personal identity, is the greatest – but the most rewarding – challenge to be faced. In the case of György Ligeti, his compositions are filled with such elements of idiom recognition, including his micro-polyphony and polyrhythmic textures among others, some of which are elaborated here.

During the 1950s a number of European (and later, American) composers chose not to follow the integral serialism or aleatorism, but to establish a new musical style, focused on timbre, harmonic sonorities and the fluctuation of textural densities. In an attempt to determine the characteristics of this, new to the 1950s, compositional approach, the term “sonorism” was introduced by both composers and musicologists, to describe the exploration of new, unconventional sounds and musical textures from traditional instruments, produced by expanding the instrumental potential through extended techniques.

Researcher Danuta Mirka, in her book *The Sonoristic Structuralism of Krzysztof Penderecki*, describes sonorism as an exploration of pure sound values of the musical material (Mirka 2014, 25).

This practice seems to be reflected on different levels in works by composers of the twentieth century. Figure 1 presents four composers who have utilised different media in their individual compositional style to shape and organise the texture of their works within this context.

Composers	Media
Witold Lutosawski	Aleatoric counterpoint
Krzysztof Penderecki	Graphs
Iannis Xenakis	Stochastic methods
György Ligeti	Micropolyphony

Figure 1. Media of texture organization per composer.

In Ligeti's music, there are examples of works in which the composer makes use of extended techniques. This is evident, for instance, within two of his masterpieces: in *Apparitions*, where extended instrumental techniques are utilised as a means to organise aspects of articulation, as well as within the breath-tone passage of his *Atmosphères*.

Beyond these examples, there are also cases of works in which Ligeti seems to achieve an "acoustic synthesis" of sound, through techniques which remind these utilised in studio WDR in Cologne, such as "additive synthesis, filtering, and fluctuating color" (phenomenon *Bewegungsfarbe*) (Iverson 2011, 63; Levy 2009, 73). This can be identified particularly in works such as *Lontano*, *Atmosphères*, or in parts of *Melodien*. here, solid orchestral sonorities seem to be synthesised, and media such as micropolyphony or rhythmical irregularities have a strong presence.

According to Ligeti's own words, as mentioned in the interview collection *Ligeti in Conversation* (1983):

Technically speaking, I have always approached musical texture through part-writing. Both *Atmosphères* and *Lontano* have a dense canonic structure. But you cannot actually hear the polyphony, the canon. You hear kind of impenetrable texture, something like a very densely woven cobweb... [*sic*] The polyphonic structure does not come through, you cannot hear it, it remains hidden in a microscopic, underwater world, to us inaudible. (Várnai 1983, 14–15¹)

¹ *Ligeti in Conversation with Péter Várnai, Josef Häusler, Claude Samuel and Himself*, trans. Gabor J. Schabert, Sarah E. Soulsby, Terence Kilmartin and Geoffrey Skelton, London: Eulenburg, 1983.

According to the acclaimed composer's words, György Ligeti's micropolyphony consists of two levels. The inner, inaudible level consists predominantly of sophisticated canonic procedures, gradually unfolding melodic lines and irregular rotations of intervals. The outer, audible level is often perceived as a shape of "clusteroid" moving parts, which form massive harmonic textures. The sound components are obscure and create interwoven sound masses, in the form of a moving cluster of various ranges and densities (Varnai 1983; Bauer 2001). Thus, micropolyphony becomes a powerful textural tool in Ligeti's hands for organising the successions of sonoristic events of this specific kind, and an important characteristic of his compositional style.

In the subsequent sections, aspects of Ligeti's organization of polyphonic textures will be examined through specific examples of three works from the composer's different compositional periods. These works have been selected with a view to exploring and highlighting specific tools with which the composer seems to manipulate aspects of texture, pitch and rhythm in his structures. More specifically, starting within a context of orchestral instrumentation, harmonic and melodic elements from *Melodien* will be explored, focusing on the interaction between melodic lines, which generate dense, textural surfaces. Following this, a discussion is attempted in relation to the organization of rhythmical elements as these evolve within a gradual opening of the musical space, by examining the opening of the third movement of the *Chamber Concerto*. Finally, relevant aspects of rhythmic structure and melodic contours are addressed, within the single-instrument context of the *Touches Bloquées* piano étude. The analysis of the extracts presented bears no generalization purposes, as it is acknowledged that the specific examples cannot justify broad generalizations about Ligeti's practice.

EXPLORATION OF HARMONIC AND MELODIC ELEMENTS IN LIGETI'S *MELODIEN*

The orchestral work *Melodien* was composed in 1971 and is one of the most representative examples of Ligeti's writing. It is a pivotal work between the sound clouds and the triadic organization, followed in his later works, such as the *Horn Trio*, composed in 1982 (Searby 2001). For a post-1950s contemporary composer, the melodic shaping seems to have been the "forbidden fruit" of modern music. Unlike his previous works such as *Lontano* and *Atmosphères*, in which Ligeti uses canonic procedures to shape their texture, this process does not seem to be applied in *Melodien* (Reiprich 1978; Bernard 1999; Bauer 2001). In this particular work, Ligeti seems to shape his melodic lines through different ways of utilization and organization of intervals.

At the beginning of the work, rapid, superimposed waves of ascending gestures, which are primarily chromatic, are presented by the majority of the instruments

(Baca-Lobera 1991). The simultaneous sound of these ascending gestures seems to form a melodic and harmonic grid of horizontal and vertical major and minor seconds, which might be perceived as a moving cluster.

Taking a closer look at the beginning of the previously-mentioned ascending gestures of individual instruments, various pitches are used as their starting points. From a macro-structural point of view, the isolation of the starting pitches of each gesture seems to create a melodic contour for individual instruments, which constitutes the melodic “spine” of the first part (bars 1–10).

The figure below illustrates the sequence of pitches utilised as starting points for each gesture within the Flute part, as found in bars 1 to 6. The solid-line circles include pitches which appear for the first time, while pitches which appear for the second time are placed within dashed circles.

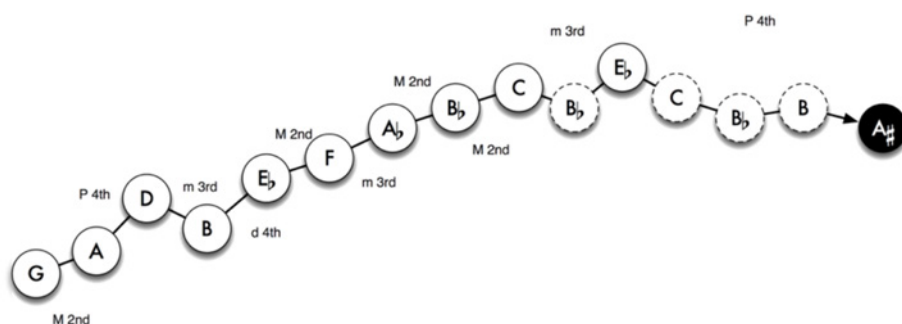


Figure 2. Melodic shape created by the sequence of pitches.

The final pitch mentioned in Figure 2 (A sharp) is persistently repeated throughout bars 4–6, leading to bar 7, where the dematerialization of the overall instrumental texture of this section begins. The intervals mentioned between pitches which are introduced for the first time indicate the shape of this specific melodic contour, suggesting the direction of the flute sound waves in this section. It is worth mentioning that the listener’s perception of the melody might not necessarily occur through the contour created by the individual pitches used as starting points. In contrast, the main audible melodic element of this section might be perceived more clearly through the overall shape of the melodic contour. Therefore, what might be perceived in place of a melody could be the overall direction of the ascending sound waves, as this is shaped by the sequence of the starting pitches.

In the next section (bars 11–30), Ligeti organises his sound clouds by gradually unfolding a melodic line through additive repetition, in 57 distinct steps. Beginning from bar 14, the pattern of F₅ and A₅ appears in the Piccolo part, which is repeated continuously and gradually expanded by adding further pitches to the initial two-note material. The same idea is applied to various instruments following the Piccolo

throughout this section. The melodic lines are rhythmically organised with triplets, quintuplets, sextuplets and septuplets, along with syncopations in the Violin 2 part, which suggests four subdivisions per beat. The simultaneous sound of the combined rhythms from the melodic lines of all instruments generates complex rhythmical irregularities, which create the impression of a harmonic texture produced by the vertical sonority of the individual melodic lines.

Figure 3 below represents the first four steps of this melodic compositional process, indicating the enrichment of the primary material of F_5 and A_5 as found in bars 14–18 of the Piccolo part. At the same time, harmonic possibilities for each step seem to be implied. Therefore, each step of the following figure might be viewed both as melodic and harmonic musical material.



Figure 3. The four steps of unfolding melody in bars 14–30.

Similar melodic shaping can be found in Ligeti’s *Ten Pieces for Wind Quintet* (1968), where three different melodic lines are developed by the Flute, the Clarinet and the Bassoon (Clendinning 1993). A similar process of melodic material enrichment is presented in Figure 4, which shows the melodic progression for the Flute part, as identified within the first four bars from the eighth movement of the *Ten Pieces*.

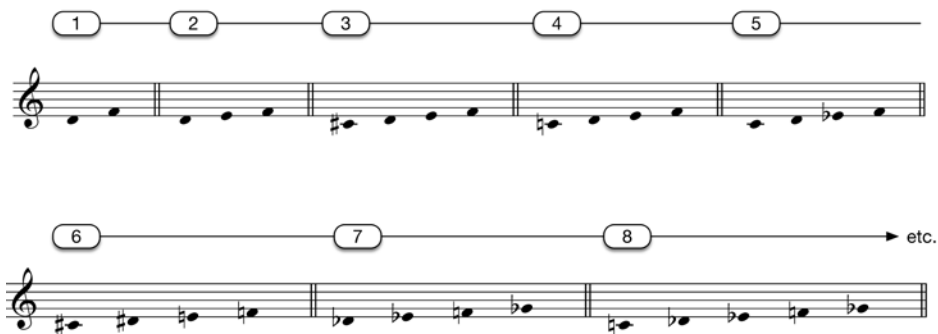


Figure 4. Enrichment of Flute melodic material in Movement 8 of *Ten Pieces for Wind Quintet* (bars 1–4).

On another level, along similar lines, this idea of gradual melodic development can be traced in works by Steve Reich and other minimalists, who use what often seems to be minimum compositional material in order to develop a melodic concept in a progressive manner. Relevant examples for reference might include Terry Riley's *In C* (1964), Steve Reich's *Vermont Counterpoint* (1982) and *Eight Lines* (1983).

In bars 46–56 of *Melodien*, Ligeti expands the two initial textures described above by using arpeggiated patterns. Examining the parts where these patterns are more prominent indicates ways in which Ligeti seems to shape the density, the intensity and the mobility of the texture in this section by developing the range of the various sonic events. Starting from bar 46 with the Viola, a rather newly introduced arpeggio-style material of three notes (F_3 , G_3 and B_3) is presented. This idea appears consecutively from various instruments in every bar, creating the impression that this developing pattern passes from one instrument to another. The following table illustrates the beginning points (with bar number) of this idea, as presented by each instrument.

Bar Number	46	47	48	49	50	51	52	53	54	55	56
Instrument	Vla.	Pno. Vibr.	Vla. Vln. II	Bsn.	Cl. Pno. Vibr. Vlc.	Cl. Bsn. Tpt.	Vibr. Pno. Vla. Vlc.	Cl. Cb.	Cl. Pno. Hrn.	Ob. Bsn. Fl. Tba. Vlc.	Vla. Cb.

Table 1. Introduction of arpeggiated pattern per instrument(s), per bar.

As shown in Figure 5, the initial range of this motive is quite limited when introduced by the viola, while the overall, expanded, range of the arpeggiated texture appears in bar 55, by the flute and the contrabass.

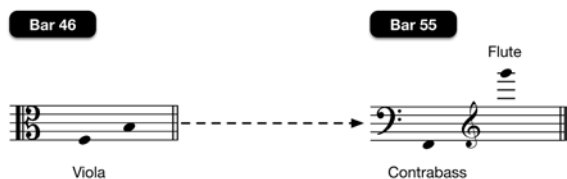


Figure 5. Expansion of the range of the arpeggiated patterns (bars 46–56).

This idea of the arpeggiated movement can be located again in bar 70, where the vibraphone introduces another similar element with an even more limited range (B_3 and C_4 sharp). The initial range reaches its peak in bar 83 (C_4 – G_5), while similar patterns are successively introduced through various instruments: for example, the

violoncello starts with a persistent C_4 , progressively expanding to the range of A_2 flat – E_4 flat, in bar 80. This material is gradually developed and expanded dramatically by the entire orchestra, reaching its widest orchestral range in bar 91, within a low dynamics environment (p to ppp). The following figure presents the range of the initial pitches (a) as introduced by the vibraphone in bar 70, along with the expanded orchestral range (b) as encountered at its peak point in bar 91 by the violoncello (E_3 , lowest pitch) and the piano (C_8 , highest pitch):

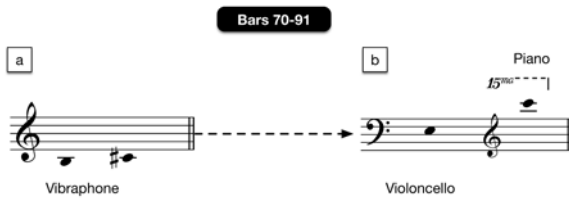


Figure 6. Expansion of the range of the arpeggiated patterns (bars 70–91).

The final section with arpeggiated texture begins from all the strings simultaneously (bar 107), with the exception of the Contrabass, which maintains a sustained harmonic. The reappearance of this idea in bar 107 seems to signify a change of the texture, which becomes more mobile, in contrast to the sustained pitches of the previous section (bars 96–106). In this case, the arpeggiated movements of each individual instrument appear significantly broad right from the first bar of the section (bar 107). More specifically, the initial range of each string instrument is presented in the following figure (Figure 7), along with the overall range of the arpeggiated texture of the whole string ensemble within this section.

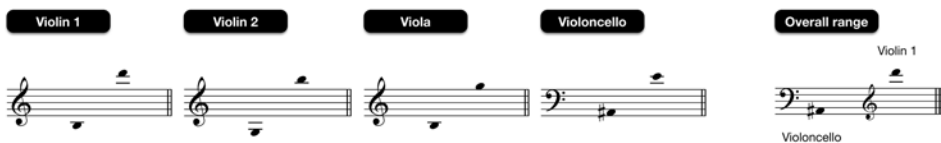


Figure 7. Individual string instruments and overall range of the arpeggiated patterns in bars 107–109.

In the entire arpeggiated section, the interwoven arpeggiated patterns seem to create polyrhythmic textures as well as horizontal melodic lines, which result from the alternation of the presented pitches. In this context, melody does not appear in its traditional form, but seems to emerge more from the listener’s individual interpretations of the perceived pitches.

the rhythmical irregularities occurring from the accented pitches, thus forming the polyrhythmic texture of the beginning section. In addition, the bottom part of the figure depicts the melodic contour which is generated from the melodic expansion of pitch E_4 , supporting the rhythmic material. This contour is first introduced by the winds, brass and keyboards and later reappears by the pizzicato strings at the end of the section.

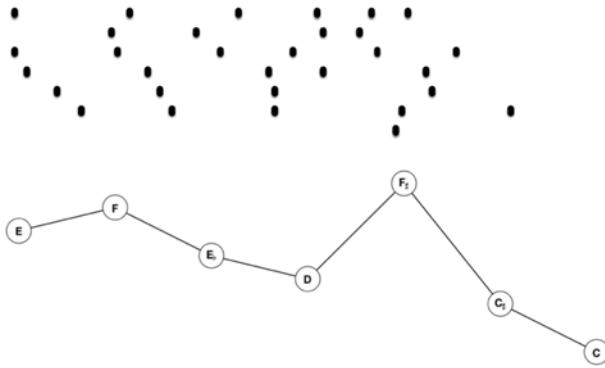


Figure 9. Visualization of rhythm created by *sfz* entries in the opening of *Chamber Concerto* (Movement 3).

Étude No. 3, Book I, Touches Bloquées (1985)

Although Ligeti used polyrhythmic elements in his music since his early compositional period, his interest in this practice seems to have become more prominent during the 1980s. Medieval music, African rhythms, as well as composers Colon Nancarrow and Roberto Sierra contributed to his inspiration in relation to polyrhythmic writing (Toop 1999).

In his third *Étude* from Book I, Ligeti uses a very inventive and effective way in piano writing to achieve numerous rapid upbeats and rests with high rhythmic accuracy. The performer is asked to play numerous rapid alterations between sonorous pitches and silent notes of equal values (quavers and silent quavers), creating the effect of sounds and rests. To achieve this to the highest level of rhythmic accuracy, Ligeti has utilised the technique of silent key pressing: the performer silently blocks specific keys as indicated by the composer, and presses them along with the non-blocked keys, which creates the effect of highly accurate rhythmic sequences of values and rests.

More specifically, *Touches Bloquées* has a simple ternary form, A–B–A1 (bars 1–71; bars 72–91; bars 92–115 respectively), where individual quavers or groups of quavers dominate the rhythmic structure of the work. The rhythmical texture of

the Étude is based on a continuous quaver pulse which is interrupted by rests in the texture, created by the blocked keys. Pairs of audible and inaudible quavers create a repeated effect of alternating sound and silence, which is prominent in the first part of the work. The succession of these sonorous or soundless elements occasionally appears as gestures of two, three, four or five quaver or silent quaver groups. The appearance of the above groups shapes the characteristic rhythmic irregularity of the work, since elements of this idea are also evident in the next parts. The following extract from the score (Figure 10) presents an example of such gestures in the left hand part, indicating the number of audible, slurred quavers per group, as found in bars 26–33:

Bars 26-33

4 5 3 4

5 4 4 4

Figure 10. Number of audible quavers per slurred group (bars 26–33).

Figure 11 below illustrates the sequence of two-, three-, four- and five-quaver groups, as these appear from bar 2 to bar 71 along the first part (A) of the piece, representing the polyrhythmic structure of the sound material. These gestures are occasionally interrupted by single, double or triple (found only in bars 50 and 51) silent quavers, alternating with single audible quavers. The indication “Bars 26–33” refers to the score extract, presented in Figure 10 above. Finally, the complementary table (Table 2) summarises the same information, namely the number of audible quavers per group, also including the bars in which these are located. Bars marked with * indicate groups of quavers which are shared between these specific bars.

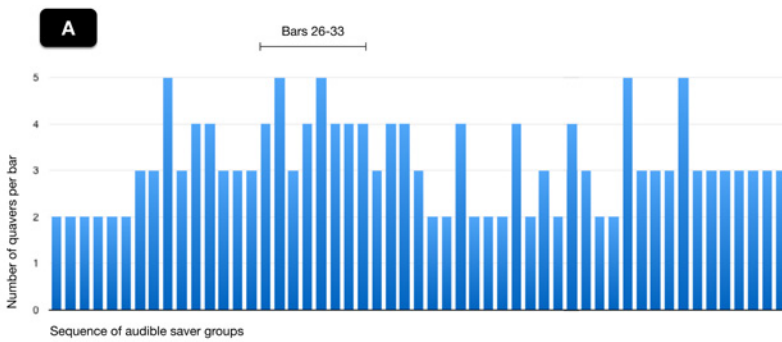


Figure 11. Sequence of audible quaver groups and number of quavers per slurred group in part A (bars 2–71).

Bar Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Quavers per group	-	2	-	2	-	2	-	2	-	2	-	2	-	3	3	-	5	3	4	-	4	-	3

Bar Number	24	25	26	27	28	29	30	31	32	33	34	35	36	37	37-38*	38	38-39*	39
Quavers per group	3	3	4	-	5	3,4	5	4	4	4	3,4	4	3,2	2	4	2	2	2

Bar Number	39-40*	40	41	42	42-43*	43	43-44*	44-45*	45	46	46-47*	47	47-48*
Quavers per group	4	2,3	2,4	3	2	2	5	3	3	3	5	3	3

Bar Number	48	48-49*	49	49-50*	50	50-51*	51	52	53	54	55	56	57	58	59	60
Quavers per group	3	3	3	3	3	2	3,4	2	2	2	2	2,2	2	3,2	-	2

Bar Number	61	62	63	64	65	66	67	68	69	70	71
Quavers per group	2	2	2	3,2,2	2,2	3	2	2	2	2	2,3

Table 2. – Number of quavers per groups within bars of part A (bars 1–71).

From a macro-structural perspective, various observations can be made in relation to the shaping of melodic contours throughout the first part of the étude. In the first 14 bars, the melodic material seems to be developed in an ascending manner above a repeated B_3 pitch. This melodic course is demonstrated in Figure 12:

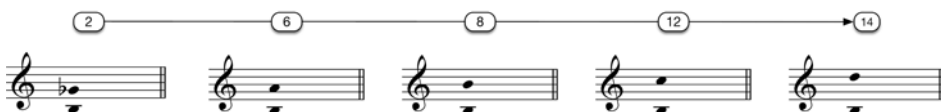


Figure 12. Illustration of the ascending development within bars 2–14.

Along similar lines, from bar 15 to the very end of section A (bar 71), a large-scale descending melodic contour seems to evolve gradually, reaching the very end of the lowest piano register. Figure 13 shows this progressive descending movement, indicating the specific bars in which each lower pitch is first encountered:



Figure 13. Illustration of the descending development within bars 15–71.

The same groups of audible quavers seem to be applied in the structure of the middle part (B) of the work. Non legato quavers (as indicated in bar 72) are grouped into two, three, four and five per bar, through the notated barlines. These sonorous groups are used throughout this part, while no silent quavers are present. Therefore, the rhythmic complexity of this part seems to occur through the alternation of a diverse number of quavers in each bar. As depicted in Figure 14, this is evident in bars 79–82, for example, in which a successive sequence of uneven groups of two, five, three and two quavers per bar is observed; further to this, another complex rhythmical sequence takes place in bars 86–91, with an order of two, five, two, three, five and five quavers per bar. Thus, an intricate, irregular, dense rhythmic texture is created, forming the most intense part of the Étude. An illustration of the rhythmical texture of this, purely sonorous, section is attempted in the subsequent figure, which depicts the number of sounding quavers within each bar of part B, in their order of appearance.

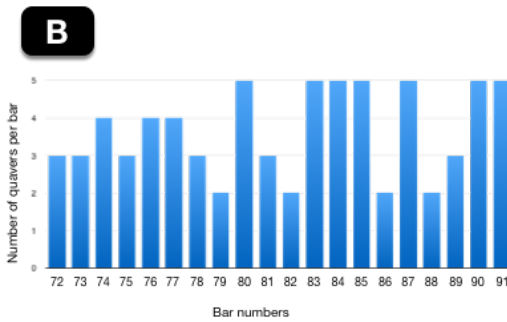


Figure 14. Number of sounding quavers per bar in part B (bars 72–91).

In part A1 the same rhythmic complexity is maintained. Again, the sound material is organised through groups of one to five slurred quavers, which are interrupted by single silent quavers. Single silent quavers are evident from bars 92–99, while from bar 100 onwards groups of silent quavers also appear. Although the idea of grouping silent quavers was also introduced in A, with up to three successive silent quavers, this idea is further developed here, eventually dominating the final part of the work. Larger groups of quavers (4, 5 and 6) appear more often than the previous rather smaller groups of 2 and 3, particularly from bar 106 onwards. The number of silent quavers in each group gradually builds, reaching its peak in the final bar, with a group of 20 silent quavers. Thus, the gradual expansion of silence leads to an effect of “dematerialization” of both pitch and rhythm. This process is illustrated in the two following figures: Figure 15 shows the number of sounding quavers in each group in order of appearance, as divided by the silent quavers; Figure 16 represents the development of the silent quavers appearance, illustrating the increase in the frequency of silent quavers, produced by gradually blocking more keys. This time, the peak of the graph represents silence instead of sound, creating the impression of a reverse climax of tension, through an irregular fade out to complete silence.

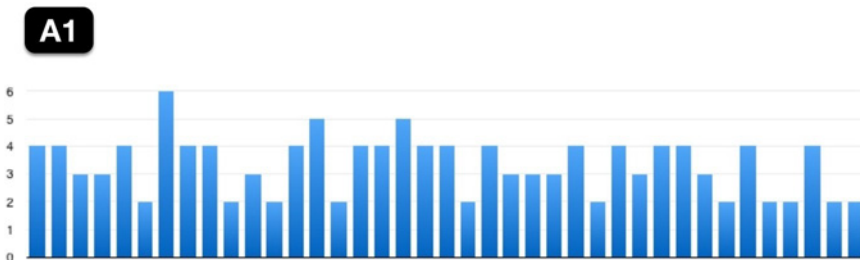


Figure 15. Number of sounding quavers in each group in part A1, in order of appearance (bars 92–115).

A1



Figure 16. Succession of grouped silent quavers in part A1 (bars 92–115).

Finally, the following table summarises the course of audible and silent quavers, as these alternate within each bar of the final part of the étude. The number of audible and silent quavers has been noted in their order of appearance within each bar. A progressive increase of silent gestures can be observed, both in terms of frequency of appearance, as well as in terms of duration through the utilization of larger groups of blocked notes, which is combined with a simultaneous decrease of the audible elements.

Bar Number	92	93	94	95	96	97	98	99	100	101	102	103
Number of audible quavers	4	4	3,3	4,2,1	6,1	4	4,1,2	3,2,4	5,1,2	2,4	4,5	1,4,4,2
Number of silent quavers	1	1	1,1	1,1,1	1,1	1	1,1,1	1,1,1	1,2,1	1,1	1,1	1,1,1,1

Bar Number	104	105	106	107	108	109	110	111	112	113	114	115
Number of audible quavers	4,1,3,3	3,4,2,1	4,3,4,4	3,2	4,2	2,4	1,1,2	2,1	1,1	1	1	1
Number of silent quavers	1,1,1,2	1,1,1,2	2,2,1,2	3,3	3,3	2,3	2,2,3	4,5	6,9	13	20	-

Table 3. – Summary of alternating audible and silent quavers per bar, in section A1 (bars, 92–115).

SUMMARY

In conclusion, stylistic characteristics of Ligeti's compositional idiom have been discussed through the examination of parts of these three very different works from different periods of the composer's creation. Aspects of his polyphonic writing have been discussed, focusing on melodic shaping, harmonic elements and polyrhythmic textures. Through this approach towards these specific works, his textures seem to consist of more abstract sound clouds, such as in *Melodien*, of mechanical patterns of complex rhythm, found in both the *Chamber Concerto* and the *Touches Bloquées Étude*, which are often achieved by inventive methods, such as through the blocked piano keys or the accents of specific beats of repeated tones. In addition, the macro-structure of the inner, micro-polyphonic and polyrhythmic layers seems to indicate extra melodic contours, mostly perceived as movements of the generated sound clouds. Undoubtedly, these are only some of the many compositional tools that have shaped Ligeti's idiomatic language, which is an inspiration to subsequent generations of composers, bringing forward inventive ways for the organization of texture and extending the possibilities of the orchestral sound.

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