

Inaudible Regularity Through Group Alterations in Ligeti's Tenth Piano Étude

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At first glance, Ligeti's tenth piano étude, *Die Zauberlehrling*, appears to fit into the same category as the earlier pieces *Continuum* and *Coulée*. As Hicks [1] points out, these pieces are defined by the ways in which “patterns of pitch and interval evolve gradually and smoothly beneath an articulative surface Ligeti produces this fluid, mechanistic music by deploying an extremely fast, even succession of notes primarily in tremolandi and scalar figures” One must keep in mind that the étude was written more than twenty years after these pieces, so although this description perfectly fits the piece, we must adapt the method of analysis. The purpose of this paper is to formulate a set of rules that can be used to analyze how Ligeti developed patterns in *Die Zauberlehrling*.

Inventing allowable rules to describe a work of Ligeti has precedent such as the aforementioned Hicks or Bernard's techniques of flips, spins, and glides to analyze sections of *Melodien* [2]. These techniques work well for Ligeti's middle period where rhythm seems to be of much less importance and movement through pitch space is of greatest interest. Ligeti himself describes the

increased importance of rhythm in the piano études, “At the center of my compositional intentions in the Études lies a new conception of rhythmic articulation” [3]. Before laying out the rules for the analysis of *Die Zauberlehrling*, we will examine why the movement through pitch space seems less important.

The reason for saying pitch space is of secondary importance is the following observation. From measures 1 to 47 the movement is almost entirely stepwise diatonic motion through pitch space. Measures 50 to 55 follow a strict pattern which will be explored later, but could be described as essentially stepwise chromatic motion. Measures 55 to 66 consists of stepwise whole tone motion. At 66 the right hand moves in stepwise diatonic motion while the left hand moves in stepwise pentatonic motion until 82 when the left hand continues and the right hand shifts to stepwise chromatic motion. At 88 both hands play stepwise pentatonic, and so on.

As such, tonally one could make a convincing argument that the étude is a scale study. It should be clear that using transformations through pitch space to describe the tonal motion would be a forced approach when such a natural explanation of the pitches used already exists. Instead, the theme of this paper is that Ligeti uses highly regular patterns that come in groupings. Ligeti seems to strictly follow rules for the groupings in each section of the piece. Recall the following quote of Ligeti speaking about the influence of a story he read as a child:

One of the stories was about the widow living in a house full of clocks ticking away all the time. The meccanico-type music really

originates from reading that story as a five-year-old, on a hot summer afternoon. Afterwards, other everyday experiences came to be added to the memory of the house full of ticking clocks; images of buttons we push and a machine would start working or not, as the case may be, lifts that sometimes work and sometimes do not, or stop at the wrong floor; the Chaplin film, *Modern Times*, one of the great movie experiences of my childhood. Recalcitrant machinery, unmanageable automata have always fascinated me. [4]

In typical pattern-meccanico fashion [5], Ligeti blurs or makes the machine feel irregular by breaking the symmetry or regularity of the patterns through several “illusionary rhythmic” techniques. One could argue as Steinitz does that there is precedence for this. The first organ étude is one of the most symmetric and regular of Ligeti’s career. Perversely, the symmetry is entirely inaudible due to the free tempo of the performer together with the microtonal changes of the organ pitches due to lack of air pressure [6].

The first technique I’ll describe is not one of the alteration techniques to get from one pattern to the next, but is meant to describe a way in which certain patterns are blurred. In Lauren Halsey’s master’s thesis [7], it is analyzed that in the earlier piano étude *Touches Bloquées* Ligeti creates highly symmetric lines, but makes them inaudible by having the pianist hold down a block of keys. This way when the pattern crosses these depressed keys no notes sound and the pattern is ruined.

The analogue in this étude is what we’ll call *overlapping*. This technique

refers to taking two individually simple patterns and superimposing them so that they share notes. This creates the effect of making the original two simple patterns inaudible and creating a longer, more complicated irregular pattern. Ligeti pointed out that he used this technique:

This, however, should not be understood as an ‘Ivesian’ heterogeneous layering for, on the contrary, it is the homogeneous 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. [3]

Although we will get to better examples later, a prototypical example to keep in mind occurs in the very first measure of the piece:



The left hand has as simple a pattern as one can get. The 12/8 is broken into 3+3+3+3. The pattern is to play on the pulse a two note pattern G, A, G, A and so on. The right hand also has a simple two note pattern of filling in the other two beats of the division with A, G, A, G and so on. From this verbal description it seems like the listener would readily pick up on this pattern, but the technique of overlapping obscures it. In fact, a simple octave displacement of one of the hands to prevent the overlap is all it would take to immediately be able to identify the pattern aurally.

Instead, we hear this irregular, stuttered pattern of G, A, G, A, A, G,

G, A, G. The pattern is long enough and weird enough that it would be surprising if a listener could pick out what is going on without writing down the pattern and being prompted that the longer pattern is actually an overlapping of two simpler patterns.

Now we move on to the techniques used to specifically analyze most of the piece. The idea is that a given section will have a rule to govern how a grouping in the pattern is formed and how to move from one group to the next. Except for just a few exceptions, these rules will be strictly followed. However, in order to break the regularity of the pattern-meccanico and explain why it doesn't appear at first to be following a strict set of rules, we have developed three blurring techniques, called *alterations*, which can be thought of as essentially a rhythmic analogue of Hick's blurring techniques.

Blurring might have unwanted connotations, since the term has been used to mean something different previously. The point of the alteration is to obscure the regularity that would come from following an unaltered pattern. The reuse of the term here is to emphasize that the étude is not a departure from his Ligeti's old techniques, but a direct transfer of his earlier ideas (such as periods of mistiness and clearing up) to this later period where pitch space is of lesser importance than rhythmic ideas.

Each section will have a rule set consisting of two rules. The first tells us how to make a group. The second tells us how the group can move through pitch space. An example of the type of rules one might find for a section is the following. A group will always consist of a descending chromatic scale. The way to go from one group to the next is to make the starting point of a group one semitone higher than the starting pitch of the previous group

(this is a real example from the *étude*). Without alteration, this will be readily audible to the listener and sound like a working machine rather than a malfunctioning one. Example:



With this example, we can now describe the three allowable alterations. The first is a *contraction* (possibly thought of as a grouping analogue of Hick’s infolding of a boundary interval). In the above example, the groupings are four notes long. Contraction just means to contract the group to a three note group. Note that with this set of rules there is only one way to do this and still follow the rules. We merely chop off the last note so that after that point the groups are three notes long:



The next example is an *extension* (or the grouping version of unfolding a boundary interval). This is the opposite of a contraction. It takes a group length of four to a group length of five notes. It should be clear how this works without an example. The last allowable alteration is a *phase shift*. This just means to insert or remove one beat of rest so that the groupings occur out of phase with the earlier pattern by one beat. This terminology

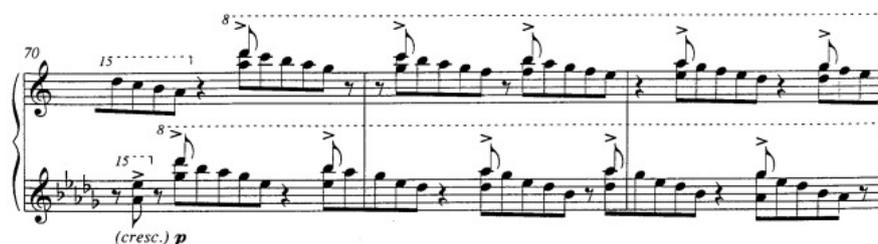
comes from Reich's piano piece *Phase Shift* and this technique was used by Halsey to analyze the étude *Entrelacs*.

Almost the entire étude can be described in these terms. The piece is divided up into sections. Each section has a rule set for the groupings and how the groupings move. The three alteration techniques above then describe how the groupings deviate from these rules. It would seem the last remaining question is how do we tell where the sections begin and end. Interval signals such as those found in *Lux Aeterna* have been used by many people to describe a signaling of a new section ([8], [9]). This has mild success near the beginning of the étude where the section changes are subtle. Later the sections change much more abruptly with no apparent interval signal. It is important that the section choices are not arbitrary to force the piece to this analysis, but the rule sets tend to change only when there is an abrupt change in which scale is being used.

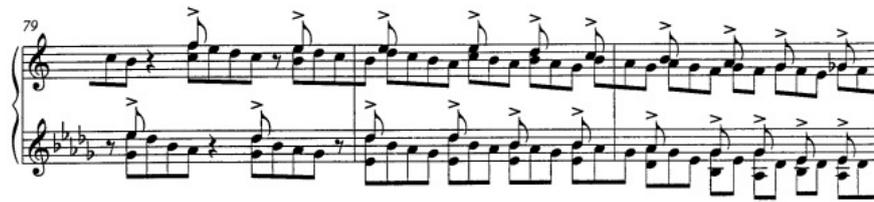
The most convincing case for this type of analysis happens in the most complicated part of the piece. We start by analyzing measures 70-96. This section really begins a few measures earlier at the register shift of 66. The rule for the groups played by the right hand is descending, diatonic, and stepwise motion. The groups may move by the same rule, i.e. the first note of the preceding group is diatonically one step higher. Ignoring the number of notes in the group, the length of rest between the groups, and the two exceptions of stray non-group notes, one can see that the rule set is strictly followed without exception between 67 and 81.

The left hand follows the same rule set except instead of scalar diatonic motion, the groups are scalar pentatonic motion. The left hand follows the

rule set strictly for the entirety of the section under consideration (up to measure 96). This already makes a good case that a highly regular collection of rules was used through this section to decide how motion through pitch space should work. Tonally these patterns are blurred because the right hand moves only using white keys, and the left hand moves only using black keys. To confuse matters for the listener even more there is overlapping between the hands:



Now we proceed to check that all alterations from the original grouping pattern can be explained using a single alteration from the allowable list. At 70, both hands are using a five note pattern with two beats of rest. Phase shifts happen periodically by either adding or removing a single beat of rest in the first few measures. It is interesting that by the end of 74 the left hand has phase shifted almost a full five note cycle ahead, but then the right hand catches back up over the next several measures. At 79, both hands start contracting until in 81 they both get down to two note groups with no rests between them.



After this, the left hand continues to use the same rule set as before, but the right hand changes its rule set to the one given in the first example. Namely, the rule is descending chromatic scalar motion and each group may move its first note using ascending chromatic motion. Both hands use the alteration of extension to expand the groups from two notes all the way up to five for the left hand and nine for the right.

At 87 they merge into one overlapped group pattern. The rule set is descending pentatonic motion. The first group half-way through 87 is 11 notes long and each subsequence one contracts by one until the last groups at the very end of 89 are two notes long:



The two hands separate out into two rule sets again, but both are the same using descending pentatonic motion. The same type of analysis takes us all the way through 96, but there are a few exceptions that need to be made in the 90-94 section. The other place in the section that needed an exception was the introduction of some whole steps in the chromatic rule set

of 84 to 86. Although the alterations don't allow for this, it is clearly in the same general philosophy of this analysis technique. The groupings are undergoing minor alterations to get from chromatic motion to pentatonic motion rather than changing abruptly.

There are over a hundred groups in this segment and only around five exceptions which is why we began with this section. Note that only *a single* alteration was needed to explain how to go from group to group. This is part of the power of this theory. We did not need any complicated combinations of allowable alterations to explain what was going on. The astute reader may be wondering about the doubled notes at the start of each group, but we can either take this to be part of the definition of the group's rule set or as two extra overarching groups following descending scalar motion. They don't seem to pose any sort of major problem to the theory.

To continue, we will now proceed in the order of the piece. The overlapping technique was already illustrated for the first seven measures. Not much can be said about the first 29 measures by way of the alteration techniques, because the patterns never phase shift or change length. We bracket the opening as an anomaly whose primary purpose is to establish the alternating major second as an interval signal and the speed of the piece. In other words, there are no irregularities to be explained. On the other hand, the perceived regularity doesn't seem to be following any strictly well-defined rule set either.

There is then a two measure transition to the same pattern down exactly one octave. The transition is easily explained using a rule set: a group is formed by alternating increasing then decreasing notes stepwise diatonically

and the next group repeats down one note of the scale. We'll call this rule set one (RS1). Here it only functions as a transition, but it will come up again later.

At 34 we have the original overlapping pattern from measure one, except now it is on B and C. At 36 we have the first alteration which comes as an extension. At 38, it alters the overlapping pattern by extending then contracting then contracting then extending to divide the measure into a 4+3+2+3 grouping:



At 41 we find a major second. This is the first time two notes are played simultaneously. It is interesting to think that earlier types of analysis, such as Hicks, might be tempted to say that the interval is unfolding in pitch space. In light of the previous analysis and the unusual choice of stemming, this can be explained as the first time a second group is formed. Up to this point, there has only been one grouping pattern. This major second should be thought of as a second group pattern that has started and is being played simultaneously with the first (the fact that there was more than one group pattern in the earlier analysis was taken for granted).

This new group follows RS1 exactly. In fact, the pattern begins earlier, but is overlapped so that it doubles already playing notes as seen in 38 and 39 above. The lowest note alternates between A and B for two measures,

then descends to alternate between G and A and descends again and so on for the duration of the section (this implies there is a stemming typo at 45, the last shown measure below, where the F should be downward and the G a part of the other group):



Taking as our philosophy that Ligeti uses a highly regular pattern to move through pitch space but obscures this fact through rhythmic irregularity, our first major section of interest is 50-55. This is another transition to a lower register and the movement can be explained as following a strict rule. The note occurring as the lowest first note of each group moves by a half-step upwards, then a minor third downwards and repeats this through the whole section. The middle voice, which occurs as the higher first note of each group, moves in strictly descending stepwise chromatic motion. The other notes are an ostinato alternating between B and C to fill in the 4+3+2+3 pattern:



As we see, upon analysis this section is highly regular, but audibly this pattern is blurred because the pattern only sounds to the listener sporadically as some complicated polyrhythm. The remaining section that connects this back up to where our analysis started at measure 66 has a similar stepwise pattern in the bass (stem down), but now the scale being used is whole tone. What we were earlier calling the ostinato notes are now just descending whole tone scales that fill out the group still in the 4+3+2+3 division.

The only remaining parts of the *étude* left to analyze are measures 97 to the end. Much of this is similar to the beginning, so we will omit analysis of it. The ending, like the beginning, can be bracketed as anomalous. There don't seem to be any set rules or patterns here. Instead, ideas from the patterns set up from each of the earlier discussed sections all make an appearance. The end seems to be a quick recapitulation of each section. Even the very last scalar run seems to not be able to decide whether it is diatonic, chromatic, or pentatonic. With how easily the alteration technique worked in other parts of the piece, it would seem odd to try to force one here.

Overall, since the piano *études* are so late in Ligeti's career, it makes sense that movement through pitch space follow a more conventional form such as scalar motion. The purpose of the above analysis is to give a method

for understanding how ideas that were so central to his earlier career, such as blurring in the micropolyphony techniques and the breaking of symmetry and regularity in the pattern-meccanico techniques, are manifested in pieces where illusionary rhythmic motion takes precedence over movement through pitch space. It would be interesting to see if the alterations technique would have success in other similar piano études.

References

- [1] Michael Hicks. Interval and Form in Ligeti's *Continuum* and *Coulée*. *Perspectives in New Music*, 31(1):172–190, 1993.
- [2] Jonathan W. Bernard. Voice Leading as a Spatial Function in the Music of Ligeti. *Music Analysis*, 13:227–253, 1994.
- [3] György Ligeti. On My Etudes for Piano. *Sonus*, 9(1):3–13, 1988.
- [4] *György Ligeti in Conversation with Péter Várnai, Josef Häusler, Claude Samuel and Himself*. Eulenberg Press, London, 1983.
- [5] Jane Piper Clendinning. The Pattern-Meccanico Compositions of György Ligeti. *Perspectives in New Music*, 31(1):192–234, 1993.
- [6] Richard Steinitz. *György Ligeti: Music of the Imagination*. Northeastern University Press, Boston, 2003.
- [7] L.B. Halsey. *An Examination of Rhythmic Practices and Influences in the Keyboard Works of György Ligeti*. Proquest, 2012.

- [8] Jonathan W. Bernard. Ligeti's Restoration of Interval and Its Significance for His Later Works. *Music Theory Spectrum*, 21:1–31, 1999.
- [9] Robert Cogan. Analysis of *Lux Aeterna*. In *New Images of Musical Sound*, pages 39–43. Harvard University Press, Cambridge, MA, 1984.