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Examining Historical Precedents for Directional Motion in Ligeti's Mid-Century Works

ABSTRACT

According to some recent scholarship, tonal-style voice leading and centric directionality are not possible in post-tonal musical works. To address this question, this paper begins by suggesting that ways of audiating in past historical periods engendered an accumulation of tone systems over time. Actions of memory that allowed past eras to perceive directionality and continuity in memory persist in the modern era. Pitch cycles in particular can be heard as an expansion beyond the tonal system.

Following a discussion of this historical development, sound examples will demonstrate cyclic motion, based on audiation in memory of starting groups of pitches and their cyclic expansions. The paper then proposes that cyclic groupings in works of Ligeti's mid-century period can be heard directionally, as they extend logically and musically from previous systems, establishing new tone-group relationships and centric gravitation. Detailed analyses of Ligeti's *Lux Aeterna* and *Lontano* illustrate. These analyses will extend linear analysis models, with the proviso that the directional motion is outside of tonality and can appear in many different musical genres.

The paper aims to suggest analytical applications not only to Ligeti's music but also to various types of 20th-century music, as well as directions for future compositional experimentation.

1. INTRODUCTION

The analysis of directionality and continuity in modern works is a problem of well-known difficulty. My interest in this topic was spurred by a notion that a study of listening throughout history would clarify how we musically comprehend these works, and suggest analytical approaches. Although theorists have proposed analytical methods for particular modern works, or set out rules prohibiting tonal voice leading in them, there has not yet been a study of historical types of directional motion and how they expanded in the 20th century, with analytical applications to composers' repertory.

It has been said by Straus, Kleppinger *et al*. that centric directionality is not possible in post-tonal musical works (Straus 1987 and 1997; Kleppinger 2011). I suggest that this is not a question only of techniques in any single composition but of recognizing ways of audiating in each historical period that engendered accumulation of tone systems over time, a factor not addressed by these writers. This article aims to illustrate compositional actions engaging memory and continuity which allow the building of directionality in memory, actions which continued to be used in the modern era, suggesting how pitch cycles in particular can be heard as an expansion beyond the tonal system.

In order to understand this concept and hear it in musical works, it would be advantageous to consider the full explanatory treatment that will be given to this topic in a future monograph, of which only an outline can be discussed here. Analyses of historical works will be an essential clarification of the elaborative process of the growth of systems.

Part 2.1 of this article will examine how listeners compare pitches mentally, in forms of simultaneity, to hear melodies and harmonies. Part 2.2 will discuss the historical development of this mental simultaneity through the aggregation of musical devices and systems, and present a thesis of continuing aggregation of devices into the 20th century. Part 3 will apply these principles in analyses of two works of Ligeti, his choral work *Lux Aeterna* and his *Lontano,* for orchestra.

2. PRINCIPLES

2.1 Mental Simultaneity

How does a listener know how a melody goes? The only possible way is to compare the pitches mentally, in a form of simultaneity (Figure 1). The pitches that occur are mentally retained, and a standardized scale forms in the process. If a melody is tonal, its centric note is a point of reference that is remembered when returning to it at the ending. Memory is aided by the standardization of the scale, which was made more memorable by pleasant-sounding overtones which tune up well, fostering a centric organization, as the partials themselves elaborate the sine tone.

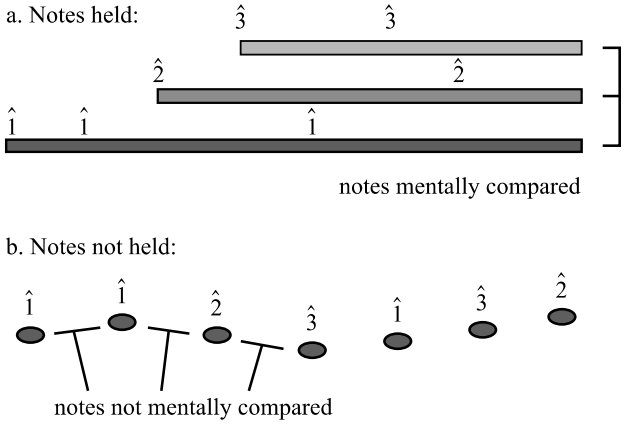
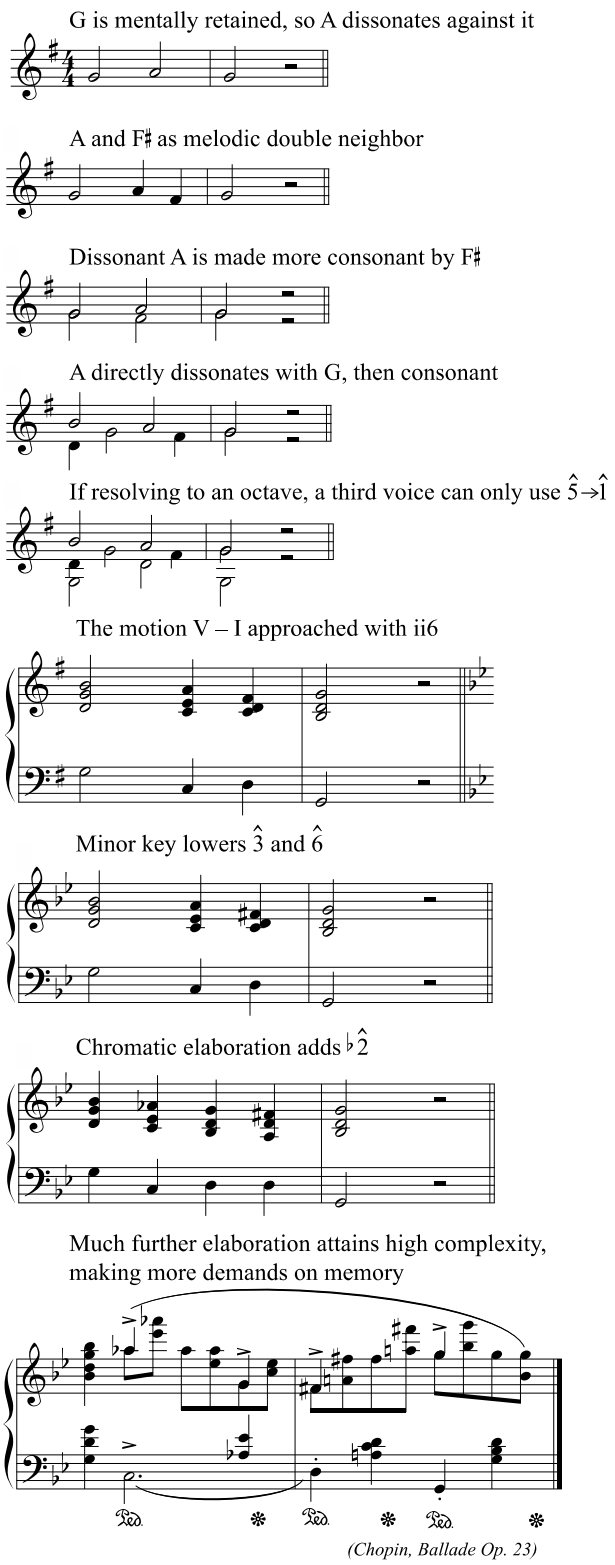


Fig. 1. To perceive the motion of notes, they must be compared in memory as a simultaneity.

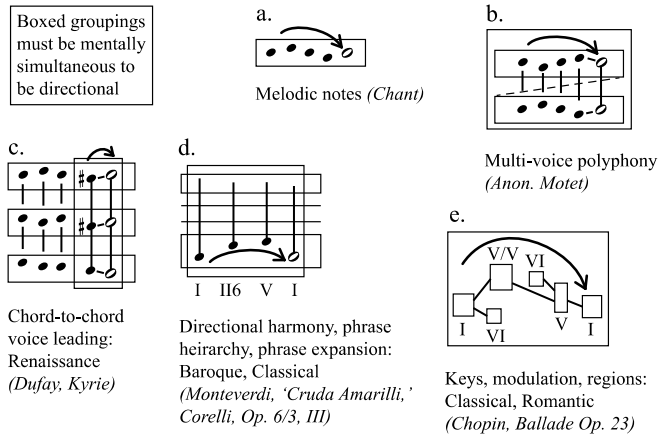
This simultaneity in memory accumulates complexity of events as the music is built up. The table in Example 1 shows a typical accumulation. In each successive stage, the added notes mentally clash against the starting note, and that is what creates their interest and expressive force, until a high degree of

expression is attained.[1] The notion of complexity can include dissonance or newness or difference, which cause mentally intense comparisons to what came before.



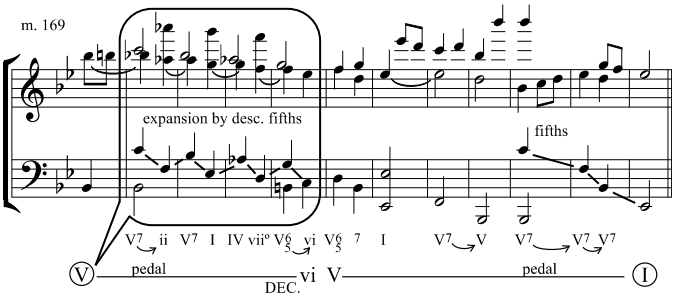
Ex. 1. Elaboration compiles simultaneities in memory, creating increasingly expressive weight.

Example 2 shows how the historical aggregation of compositional devices mirrors that of the previous table. Each level receives elaboration in the following style period, increasing the complexity and interest and retaining previous techniques as a framework. Motion is best perceived when each boxed grouping is heard as a simultaneous group. Each new technique of motion is initially sought by composers for a strong, final-sounding motion for musical ending, and once discovered to succeed, such cadencing techniques are used throughout the music thereafter. Through this elaboration, hierarchies of groupings build up, until phrases and phrase expansions turn into modulations and key regions. The mental simultaneity of chords in a tonal progression give it directionality, as chords gravitationally relate to the tonic.



Ex. 2. Historical styles mirror the aggregation of complexity.

An additional means of expansion in a tonal context is the sequence, which forms a thought bubble reaching out of a harmonic progression, but thereby increasing its weight and finality. A familiar case is from the E-flat-major theme of Chopin's G-minor Ballade (Example 3). The passage is notable for the sheer number of fifths it employs for elaborative expression, as is the entire work (Petty 2007).



Ex. 3. Expansion through elaboration by sequences (Chopin, G-minor Ballade Op. 23, mm. 169–180).

Some principles inherent in what we have been discussing are summarized in Figure 2. These emphasize that composers use the natural properties of overtones as a resource for memorability.

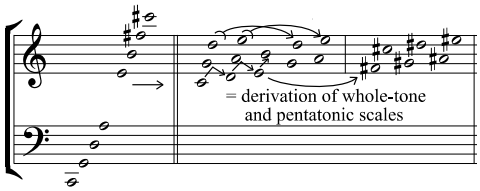
[1] All works in the illustrations are in the list of recordings at the end of this article, which were used in the spoken presentation of this paper.

1. Notes must be compared simultaneously in mind for motion to be perceived.
2. Groupings assist memory in doing this, of which centricity , scales and hierarchy are among the most ef fective.
3. Groupings tend to accumulate over time and become more hierarchically complex through elaboration, with previous groupings acting as framework, and complexity engenders expressive weight.
4. Composers tend to draw on overtones as a resource, using them to standardize systems that are easy to hear , and engaging the gravitational tendency of partials to fall for closure.
5. Most compositional devices of directional motion are discovered first at cadences, where they are needed for strong finality .
6. The directionality of closure is due to the gravitation of centricity, derived from overtones which elaborate the tone upward and fall away naturally in a downward motion.

Fig. 2. Some proposed basic principles of tonal musical hearing.

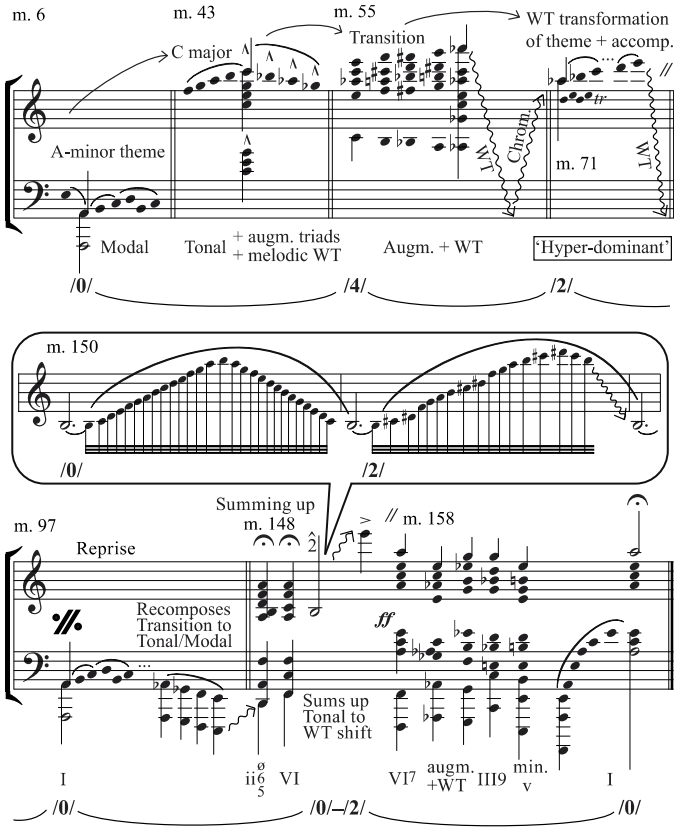
2.2 Historical Aggregation Continues

As tonality reached a point of saturation in the 19th century, the patterns of sequences were an easily audible way of expanding out of the tonal system, while retaining their directionality and attachment to the tonal center. Example 4 shows how the cycle of fifths, when condensed into a closer range, produces the whole-tone scale.



Ex. 4. Fifths placed into vocal range form the whole-tone scale.

Composers such as Debussy took advantage of these cyclic patterns for motion. In Example 5, I've outlined a framework of motion through pitch collections of the first movement of Debussy's *Suite: Pour le piano*. The tradition of using all possible devices to make audible and forceful cadencing motion is evident, with the V/V/V/V derivation of the whole-tone scale providing an effect of 'hyper-dominant', to which Debussy can even quasi-modulate by converting the modal first theme (at m. 6 and m. 43) into the whole-tone collection in the middle section (at m. 71), and using 048 triads as a transitional device (at m. 43 and m. 55).[2] In this style, cycles resolve by collapsing back to the tonal collection (m. 97). Debussy recomposes the reprise to keep it tonal. I indicate types of cycles below as interval numbers between slashes, to provide a roman-numeral-like notation. Debussy's summary of cyclic resolution in the last measures is very clear (see m. 150). In this case, the thought bubble is no longer a sequence, but still resolves. This kind of cyclic motion, from tonal collection to whole-tone and back, is shown in Figure 3.



Ex. 5. Debussy, *Pour le piano,* 'Prelude' (1894–1901).

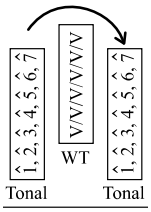
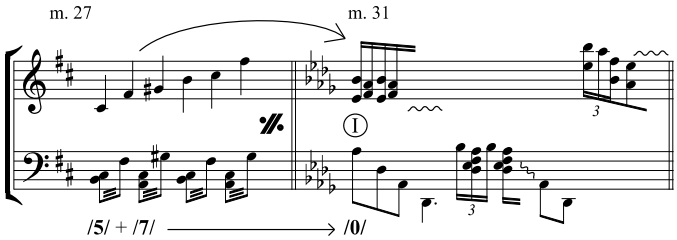


Fig. 3. Whole-tone scale as dominant field, resolving to the tonal scale.

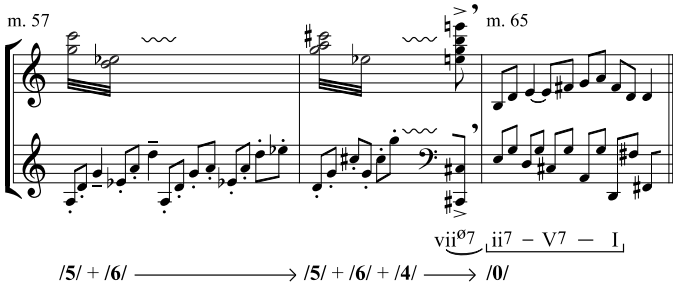
Various cycles and combinations of cycles, such as those of fifths, fourths, thirds, etc., can be used for this resolving action. Note the familiar 'sunrise' depiction in Debussy's *La mer* (Example 6).



Ex. 6. Debussy, *La mer,* 'De l'aube à midi sur la mer' (1903–1905), mm. 27–33.

Similarly, a passage by Holst from *The Planets* resolves quite strongly back to the tonal scale (see Example 7).

[2] I will use pitch-class designations for some note groupings, such as 048 for a cycle of major thirds.



Ex. 7. Holst, *The Planets,* 'Jupiter' (1914–1916), mm. 57–68.

The concept of this cyclic expansion of the tonal system requires several steps (see Figure 4).

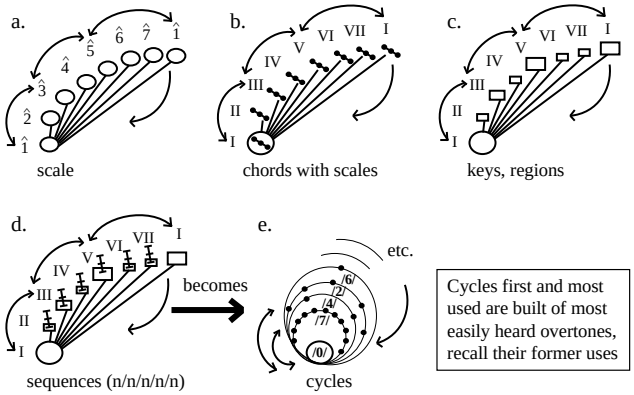


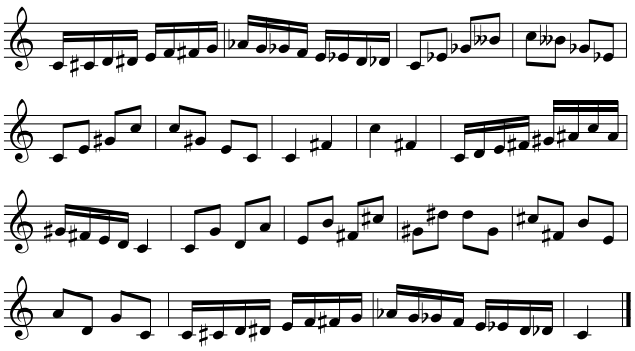
Fig. 4. The starting note is attached to all expansions of groupings; simultaneous memory of groupings is required for directional motion and gravitation toward resolution.

The initial form of attachment to the starting note, melodic scales (letter a), is expanded into mini-centers of roots of chords on the scale (b), each of which can itself be tonicized, with a sense of its own scale, producing keys and regions (c). The next expansion takes the transposing action and multiplies it, creating constructions such as V/V/V/V/V (d). These are standardized into cyclic clusters to aid memory, and although their sequential nature falls away, they retain their gravitational resolving force, and can collapse cadentially back to an anchoring pitch (e). It is crucial to note that mental simultaneity is still operating, so the concept of the exploding motion is reversible, hence centric and directional. Cycles in compositions also seem to retain a sense of their former intervallic uses, such as fifths collapsing, fourths creating an opening motion, lateral connection by thirds, neighboring semitones, and the like.

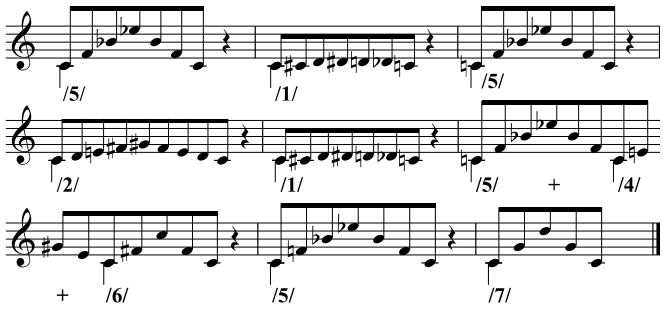
How is cyclic motion more easily heard? Students can practice with exercises such as Example 8. Singing these patterns condensed into one's own range allows a secure attachment of groupings to a starting note, and enhances the audibility of movement between them. Example 9 shows a progression of cycles with a single starting note, and with some cycles combined.

Students' aural training tends to mirror the historical development of systems, as they first grasp melody, then counterpoint and harmony, then key relations, then learn to compare tone groupings larger than a chord, such as pc–sets, scale collections, and cycles. Therefore listeners can eventually learn to grasp anchoring notes of cycles and linear melodic motion in an atonal context.

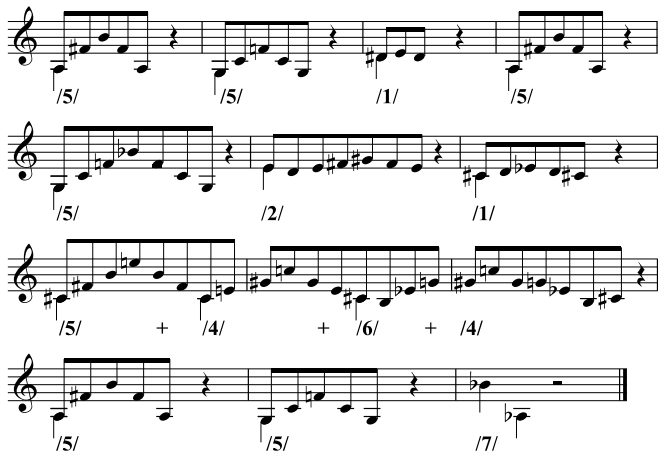
Example 10 illustrates the progression again, this time moving the anchoring pitches, forming a bass line. In this way, the motion between cyclic clusters attains true voice leading, and the anchoring pitches also relate cyclically to the end, with an additional directional resolving effect.



Ex. 8. Vocal exercise for aural training.

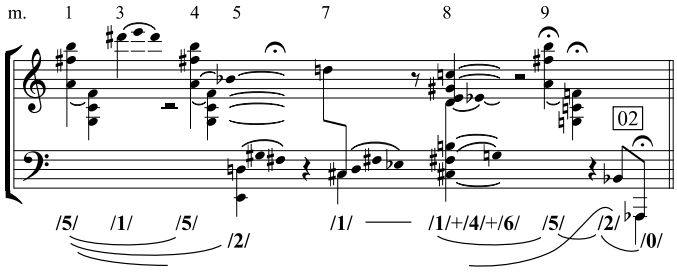


Ex. 9. Properties of intervals give cycles a sense of motion.



Ex. 10. Moving anchoring notes increases motion, like a bass line.

If this progression sounds familiar, please see Example 11, Schoenberg's Op. 19 No. 6.



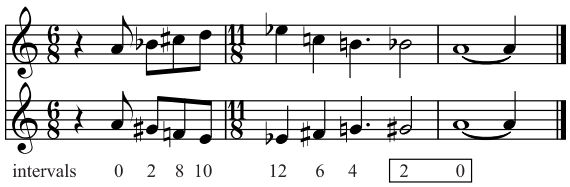
Ex. 11. Schoenberg Op. 19 No. 6 (1911, publ. 1913).

I have sketched out some of the motion through cycles, ending with the cluster of fourths recalled from the beginning moving to a closing descending ninth. The last two notes of the work use this major ninth to represent two collapsing fifths. In fact,

composers have often used the condensed version, a 02 dyad, for cadencing.

The clearly audible interval of the fifth has always been the first choice for experimentation with new compositional simultaneities — organum, polyphony, the V–I cadence, modulation to the dominant —, and such devices were first used for cadences because of their stability and finality. Thus the association of collapsing fifths with cadencing is long-standing. This clarity is why Schoenberg's falling ninth or a major second at the close of a work can successfully represent ending.

In Example 12, by Bartok, motives from the opening of the first movement are summed up neatly at the end. In this style, cycles can originate with a unison, and can collapse back to a single note. This follows from the long tradition of anchoring starting notes that we have been discussing. As we will see later, Ligeti takes full advantage of the marshaling power of the unison, to which myriad groupings in his music connect.



Ex. 12. Bartok, *Music for Strings, Percussion, and Celesta* (1936), mvt. I, ending.

These more modern examples suggest further basic principles which I summarize in Figure 5. I might go so far as to call this 'mtonal motion' — instead of atonal —, 'm' standing for 'meta-tonal' or 'multiplicative-tonal', because it has its own expanded system of cyclic motion outside of 'cptonal' or common-practice tonal motion.

7. Sequences form as an elaboration of harmonic progression, adding weight and force of closure.
8. The natural expansion and collapse of sequences suggests cycles as a centric expansion on tonality as a sys tem.
9. Cycles recall their intervals' former uses, such as cadencing, lateral connection, opening gestures, or neighboring motion.
10. Cyclic motion draws on the gravitation of overtones and they form an expanded system of directional motion that is outside of cptonality.

Fig. 5. Further principles of hearing directional motion.

3. ANALYSES

The score of Ligeti's *Lux Aeterna* consists of many pages of short fragments, so I will discuss it using the reduction table provided in Example 13. The small fragments are given canonical and systematically patterned rhythms to prevent the voices from entering together on any beats (Levy 2013). Exceptions are made where vertical chords specifically articulate the words 'Domine', 'Requiem', and in m. 94 the word 'luceat'. Those verticalities occur at significant structural points of motion. The text, part of the traditional Requiem, refers to eternal rest and heavenly light.

The work begins with a melodic trichord motive, pitch classes 013, from which gradually build up trichords in the sopranos and altos into a chromatic sound mass, dwindling to a local cadence as a unison high A takes hold in m 37. The tenors and basses suddenly enter with the word 'Domine' on a chord of F-sharp–A–B, the trichord (025), which results when each of the semitones in the set of 013 is expanded by a fifth (Figure 6). This particular trichord is also at the opposite end of the circle of fifths from the starting F, so it creates a distinct opening gesture, continuing through more frequent uses of 025 and whole-tone sound masses for the middle section of the text, cadencing temporarily on 02 after m. 56. At m. 61, all voices together have 025 and a four-octave G on the word 'requiem', building up a chromatic collection again, then subsiding to a local cadence of fifths on E-flat, then 02, then a unison E at m. 84. At m. 90 the basses and tenors in their lowest range state three chords, again on the syllables 'Do-mi-ne', which are set with two 025 trichords resolving to a D-sharp-minor triad, a quite striking device to close up the fifths-space evoked in the middle section. This continues into a chromatic buildup of motives in the altos. At m. 94 the sopranos return with the pitches B–A–F-sharp in the top of their range, recalling the three pitches from the opening of the middle section, to close down that motive, followed by a diatonic sound mass that deconstructs to a collection of fifths at m. 100, which collapse down to 02 on F for the ending. An overall framework is proposed below the staff, with the motion /0/–/7/, /0/–/7/–/0/, a construction not unlike the tonal frame I–V, I–V–I, but in a completely new cyclic system. Also audible is a beautiful descent through pitches that Ligeti highlights, from the initial high A to G in m. 61, to F-sharp in m. 100, to F at the end — the white beam. The tripartite opening-and-closing cyclic motion of the whole work, together with the shape of opening downward and upward registers, conveys the vision of heavenly light in the text, with the high note A and the high-register B–A–F-sharp used for the words 'luceat eis', or 'illumine them'. This work is an excellent example of how motives (Figure 6a) and directional motion (Figure 6b) can still collaboratively create form in a modern context.

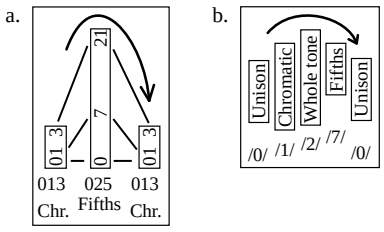


Fig. 6. Cyclic motivic expansion, cyclic motion of sound masses.

I should note that this approach assumes that an incomplete cycle can represent the full cycle, being a recognizable and standardized pattern. Also, a composition might make use of combinations of cycles for a stronger effect.

In addition, I must point out that due to the complexity involved, to hear this kind of motion clearly it is an absolute necessity to listen to entire works, and multiple times.

An analysis of Ligeti's *Lontano* is provided in Examples 14a and 14b, with a timeline and rehearsal letters at the top. This work, for large full orchestra, was said by the composer to explore different planes of sound made possible by orchestral tone colors in all ranges (Levy 2017, 205). Ligeti thought of it as similar in procedure to *Lux Aeterna*, and it begins with the same 013 trichord. The use of smaller collections proceeds in the same fashion, building from small motivic units sound masses of various types in local motions within the larger frame. The opening creates a canonic and chromatic sound mass shown by the striped crescendo, then dwindling to an 02, then a unison C after letter E. Registrally opening down to the lowest

instruments, 013 is formed on D-flat at letter F, changing to chromatic, diatonic, then acoustic scale sounds at letter H, where the formation of pcs 0, 2, 4, 6 and 7 — or in scale degrees 1, 2, 3, sharp-4, and 5 — is one of Ligeti's favored representations of fifths. The bass note B and upper E-flat then move by step to B-flat and E natural, a pure tritone verticality in the full range of the orchestra. This motion is especially interesting, because it is a true example of voice leading, with anchoring notes, one cycle audibly moving to a different one, by step. The tritone lingers, then grows into the next chromatic buildup of motives, cresting a dynamic wave at letter Q, settling into a pool of whole-tone sonority at letter R. A unison F-flat takes over, then a transition out of the whole tones and unison, first with 012 before letter V, then a unison F-natural at W, with a sudden local opening motion to 025 at letter X. From this restarting gesture large masses of trichord motives come in, first in a downward and then an upward direction at letter Y, the chromatic sound coalescing into a loud and high unison D-sharp after letter Z. This crux of the dynamic action suddenly takes off into the ether in a *subito p* at letter AA, the sound masses gathering quietly into a closing section with a complex mixture of cycles not heard before, including a formation of major sixths by A-sharp–B and C-sharp–D in the piccolo and violas at letter BB. This turns into a pile of fifths after letter CC, collapsing down to end on an 013 trichord on B–C-sharp–D. The last trichord both motivically sums up the many 013s used in the work and allows the sound of B and C-sharp to predominate, lending the effect of an 02 cadence. The overall motion of the frame is shown below the staves, an initial opening segment moving to an unmistakeable 06 tritone whose B-flat and E tones pass to a whole-tone section with descending B-flat–A-flat–G-flat–F-flat, labeled /2/, a quasi-modulatory motion similar to Debussy's hyper-dominant. This resolves to a closing section that moves from /0/ to /7/ to /0/. The motion of cycles supports an elegant descending line of prominent pitches, shown as a white beam. While the mtonal motion creates a strong opening and closing framework, at the same time it programmatically uses cycles which first engage the close overtones, then progressively more and more distant upper partials with a dynamic crescendo, seeming to express the meaning of 'lontano', which means 'far' or 'distant', by cyclically ascending the upper overtones to metaphorical reaches of outer space.

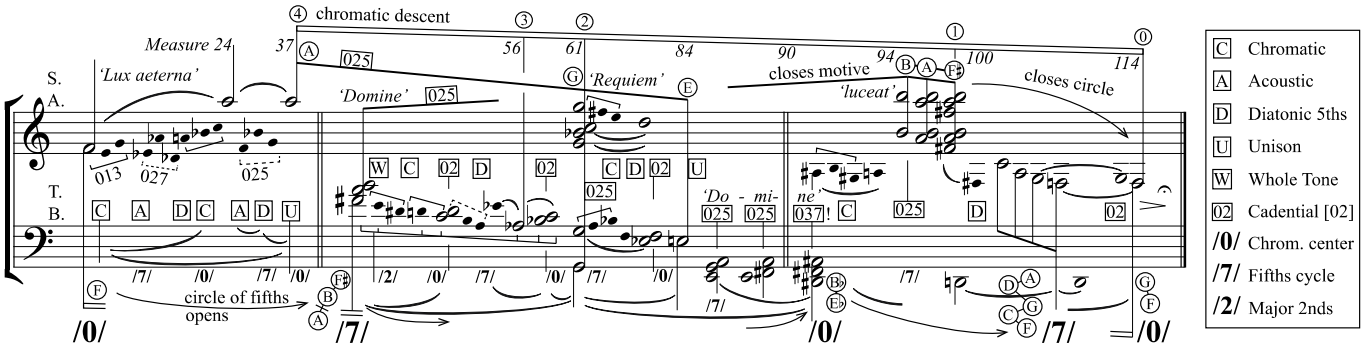
4. CONCLUSION

I began by saying that simultaneous groupings of pitches in memory are required for motion to be perceived. One might well note that without thinking of the developmental history of centricity acting as a musical memory aid, of complexity for expression, of increasingly elaborate devices of tension and resolution, and some practice hearing cycles, the audibility of this framework would not be quite as clear. In fact, it could be said that the aforementioned entire history has worked at the service of memorability, since musical complexity in the mind has such expressive force. Indeed, cycles succeed in forming memorable directional motion because their aggregation and collapse contains a resolving gravitation, even as they expand their way out of the tonal system.

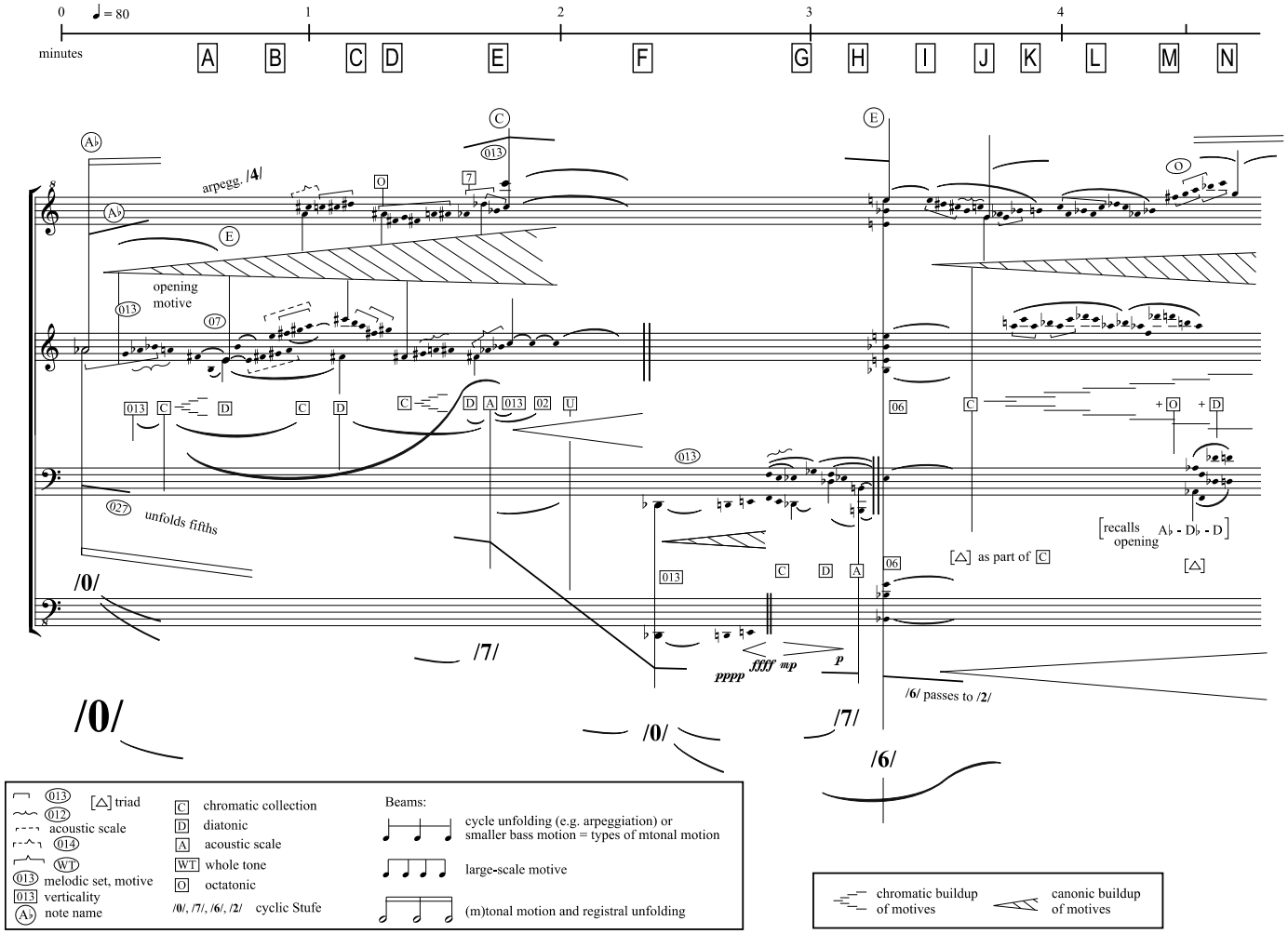
The question I have explored here is why composers choose the specific notes they do as opposed to different ones. While compositional devices such as canons and evocative sound effects can be crucial elements of the music, the more essential question is how composers discover them as first listeners, especially those who perform to experiment with sound. Music history suggests that we naturally perceive and store systematic thinking and musicianship, and are semi-consciously responding to those systems that we hear in musical passages, because we are mentally adept in ways of hierarchic remembering of the emotional effects of sounds.

This study has proceeded through logic, musical effects and history, and a close study of musical repertory. It focuses on the use of memory, on the composer counting on the listener's memory working in the same ways as his, and on the logic of embellishment that retains elaborative principles in the dissemination of musical works and in performers' responses to those works. It is worth noting that, in its historical beginnings, the entire outset of this musical logic proceeded by memory, because there was no way to write the music down, so memory is the initiating premise of musical interest, and of motion.

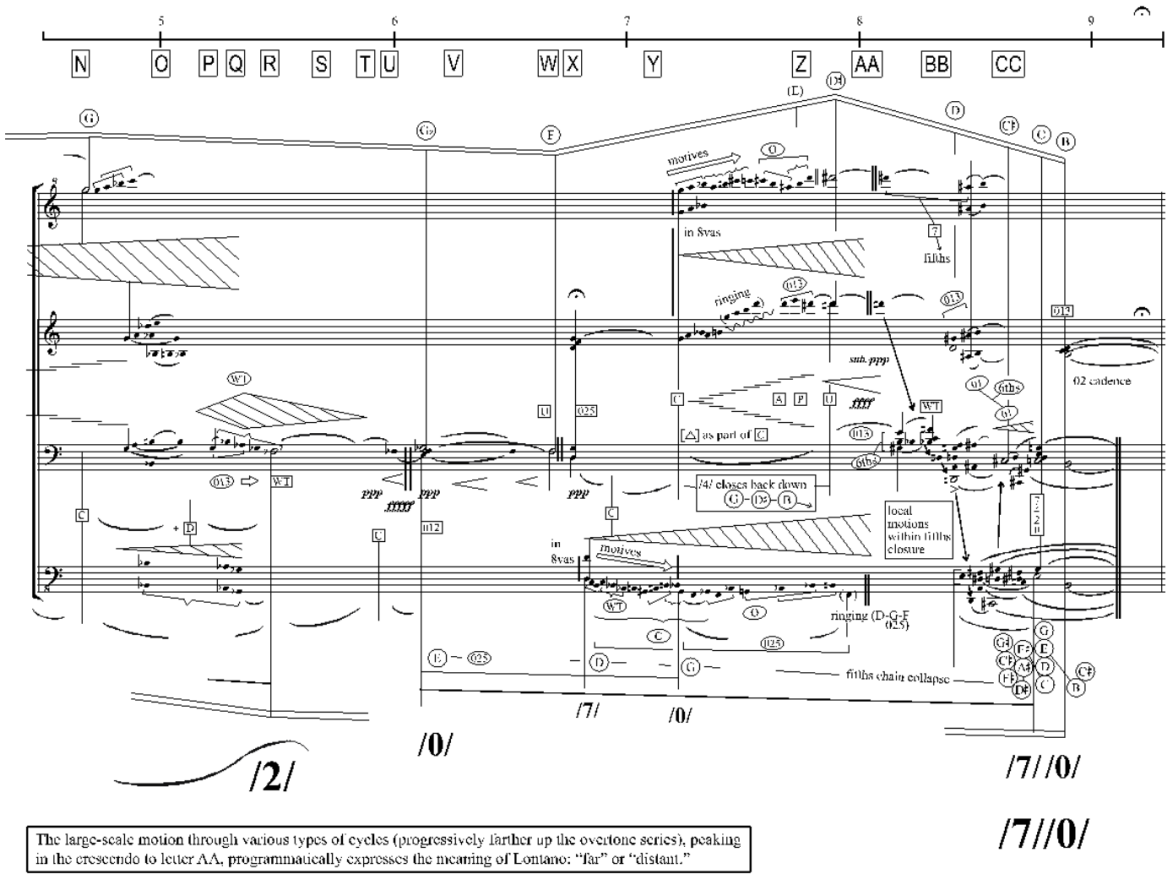
It might further be supposed that since the cyclic motion addressed here has been appearing in many different genres and styles of music — both high-art and popular —, that composers are each independently calling upon ways of hearing that have been explored since ancient times, discovering musical motions which will be successfully heard by you, the listener.



Ex. 13. Ligeti, *Lux Aeterna,* analysis.



Ex. 14a. Ligeti, *Lontano,* analysis, page 1.



Ex. 14b. Ligeti, *Lontano,* analysis, page 2.

KEYWORDS

Music Analysis and Listening Approaches, Theories of Tonality, Musical Perception, Analytical Theory, Advanced Tonality and Post-Tonal Music.

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