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Hearing Arnold in a new space : building a transformational-theory patrimony

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Hearing Arnold in a New Space: Building on a Transformational-Theory Patrimony

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The old song goes "you always hurt the one you love". Harold Bloom's The Anxiety of Influence takes that idea a step further: for Bloom, artistic creation is born from an anxiety that compels artists to rebel against the influences of their predecessors, their artistic fathers; one has to metaphorically kill the thing one loves in order to escape its shadow[1]. I realize that in order to do an honors thesis, I have to do a bit of good natured killing of my own – or at least do some sharp elbow jabbing – if only for a moment, to force myself to the front of a line of music-theoretical thinkers for whom I have great respect. So using as my touchstone Joseph's Straus's musical variation on Bloom's work as exemplified in his "Remaking the Past"[2], my goal here today is to begin by outlining for you a trend in recent music theory that places and hears music of all types in new conceptual spaces: spaces where the rules that we all learned in diatonic and chromatic harmony classes no longer apply, or are not very effective.

Specifically, the first stage of my paper will highlight points on a recent arc of music-theoretical thinking that attempts to explain how full-blown post-tonal music developed from late 19th century chromatic music: what the discipline refers to as "triadic post-tonality" – "music that is triadic, but not altogether tonally unified"[3]. I will outline briefly, but hopefully effectively, the basics of four musico-spatial approaches to analysis developed by four successive theoretical fathers – David Lewin, formerly of Harvard University, now deceased; Brian Hyer, from the University of Wisconsin-Madison; Richard Cohn; from the University of Chicago; and Michael Siciliano, from the University of Nebraska-Lincoln. In my second stage, I take cues from an American Ives scholar and a French philosopher and outline the beginnings of a remaking of my music theory predecessors, what I believe to be an extension and strengthening of their arc of theoretical thought that I illustrate with my view of passages from Schoenberg's op.11.

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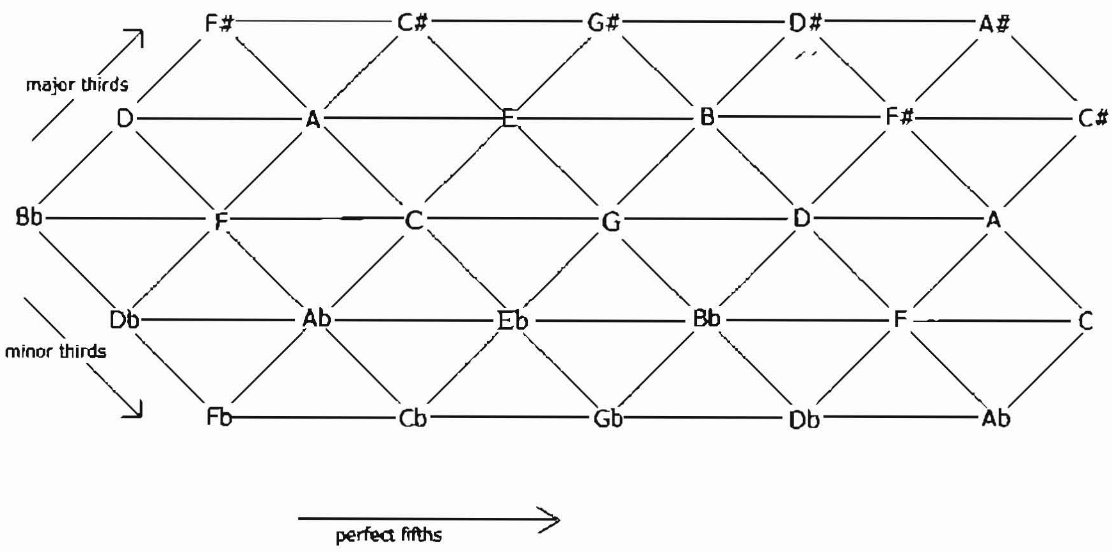
[1] Bloom, 1973.
[2] Straus, 1990.
[3] Cohn, 1998, 167.

For most graduate students, Hugo Riemann's name evokes painful memories of long and somewhat tedious hours and commiseration sessions[4]. In recent years however, aspects of Riemann's theories of harmonic function have undergone a resurrection of sorts. It was David Lewin and Brian Hyer, my first two theoretical fathers in this study, who first used aspects of Riemann's work to create innovative and powerful analytical strategies based on new harmonic and transformational spaces that have come to dominate the current music theory scene; approaches now commonly referred to as neo-Riemannian[5]. The combined work of these two music theorists uses a geometric spatial representation of a three-dimensional net of consonant triads developed by Riemann as shown in Figure 1, popularly referred to as the tonnetz – German for "tone network"[6].

Figure 1. the Tonnetz



[4] Riemann's writings on the science of musical hearing often seem far-fetched, especially his theory of the unterklänge, or undertone – the acoustic complement to the oberklänge, or overtone, though Riemann himself eventually abandoned the idea of a material acoustic structure of undertones.

[5] see Lewin, 1993; Lewin, 1987; Hyer, 1995; additionally, the Autumn 1998 Journal of Music Theory was devoted to neo-Riemannian theory and contained articles by Cohn, Lewin, Adrian P. Childs, Edwards Gollin, Stephen Soderberg, Clifton Callender, Jack Douthett and Peter Steinbach, Carol L. Krumhansl, John Clough, Jonathan Kochavi, and David Clampitt.

[6] The original conception of the tonnetz was taken by Riemann from Ottokar Hostinsky's Die Lehre von den musikalischen Klängen (1879), and used by Riemann to explore the music of Bach and Beethoven. Bryan Hyer and David Lewin first extended the use of the tonnetz to explain passages from late Romantic music.

Let's look at how the tonnetz is organized: as you can see, the notes connected by the horizontal axes are separated by a perfect fifth; the axes that run diagonally from left to right connect pitches by major thirds; and the axes that run diagonally from right to left connect pitches by minor thirds.

Though the tonnetz appears here as a two-dimensional figure, we must imagine it in a three-dimensional space: the bottom and top axes fold around to meet each other at enharmonic points, and the side edges also meet at enharmonic points, resulting in a torus, or donut shape. Each triangle on the tonnetz represents a consonant triad, but unlike conventional tonal thinking, movement between triads is defined not by root relationships, but by triadic transformations. We've been trained to think of triads in terms of their root. Lewin and Hyer's theoretical contribution is that we think of triads in terms of their proximity to one another in the tonnetz space. Though it naturally appears as something static, the tonnetz is, in application and conception, a geometric/spatial representation of a series of triadic transformations. By transformational, the theory community means that in contrast to labeling what an object is – an associational approach (that's a I chord, that's a passing tone) – the transformational theories of Lewin are Hyer are more concerned with how a given object – in this case, a triad – becomes something different; that is, what do we do to this triangle in order to get that triangle, irrespective of its root. Here, Lewin and Hyer concern themselves only with transformations from one consonant triad (major and minor) to another – that is, between forms of the same sonority, or set class[7].

The tonnetz is an important musico-spatial concept because it gives us a new vernacular with which to discuss 19th century chromaticism. Now free from the idea of "rootedness", the

[7] We could therefore describe these transformational techniques as 1st order transformations, because they are only concerned movement between forms of the same sonority, or set class. 2nd order transformations would be defined as movement between different set classes, or types of chords.

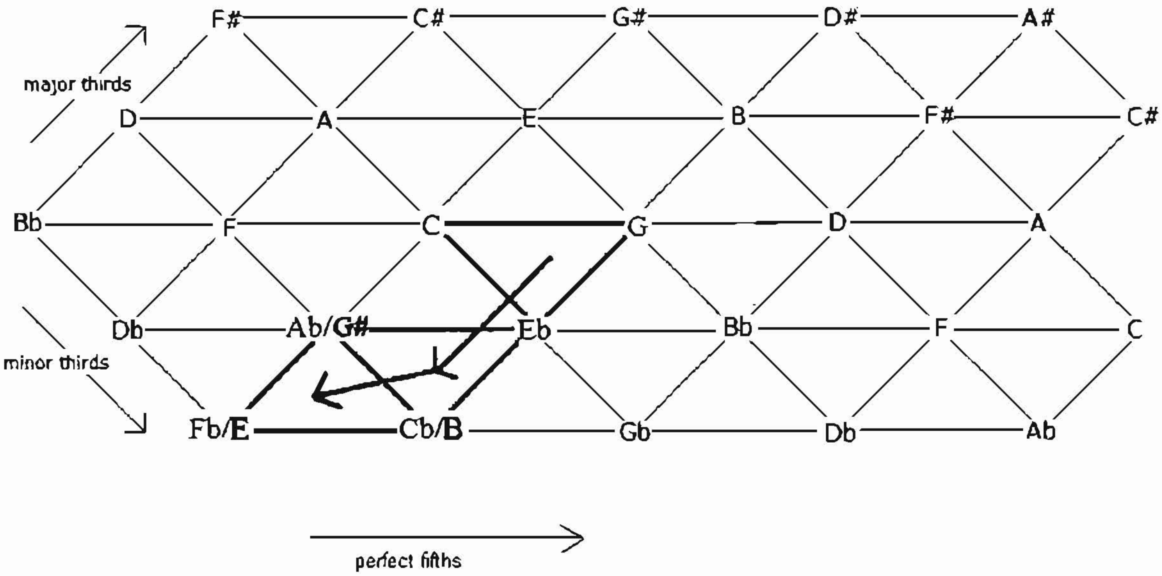
tonnetz offers a view of harmonic logic that focuses on patterns of tone retention and movement, and the relative proximity of chords on the tonnetz. For an example, let's look at a passage from Mahler's 2nd symphony[8]:

Example 1. Mahler, Symphony no. 2, first movement, bars 43–49

The three chords that occur in this passage are C-minor, Ab-minor, and E-major. A Roman numeral analysis of this progression would be cumbersome, but if we look at the tonnetz, it is easy to describe the movement from each chord to the next:

[8] Cohn, 1996, 22.

Figure 2. Mahler, Symphony no. 2, first movement, bars 43–49: chord progression illustrated on the Tonnetz

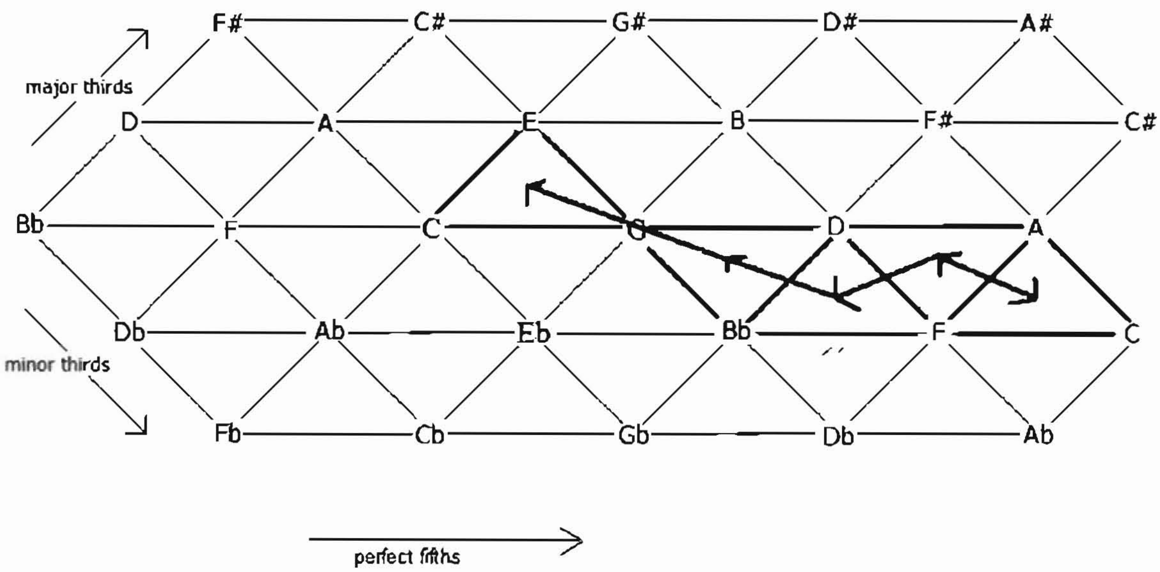


We can see a simpler example in Debussy's *Nuit d'Etoiles*:

Example 2. Debussy *Nuit d'etoiles*

The opening piano accompaniment contains a combination of F-major and D-minor chords, then moves to Bb-major, and then a sonority that seems to be a combination of C-major and G-minor, before returning to F-major. This movement could be described in roman numerical terms as a sort of I-vi-IV-V-ii movement. But matters are complicated because in many instances, two harmonies occur at once – the left hand plays F-major while the right hand plays D-minor. Perhaps we can better understand the passage by looking at the tonnetz:

Figure 3. Debussy *Nuit d'etoiles:* chord progression illustrated on the Tonnetz

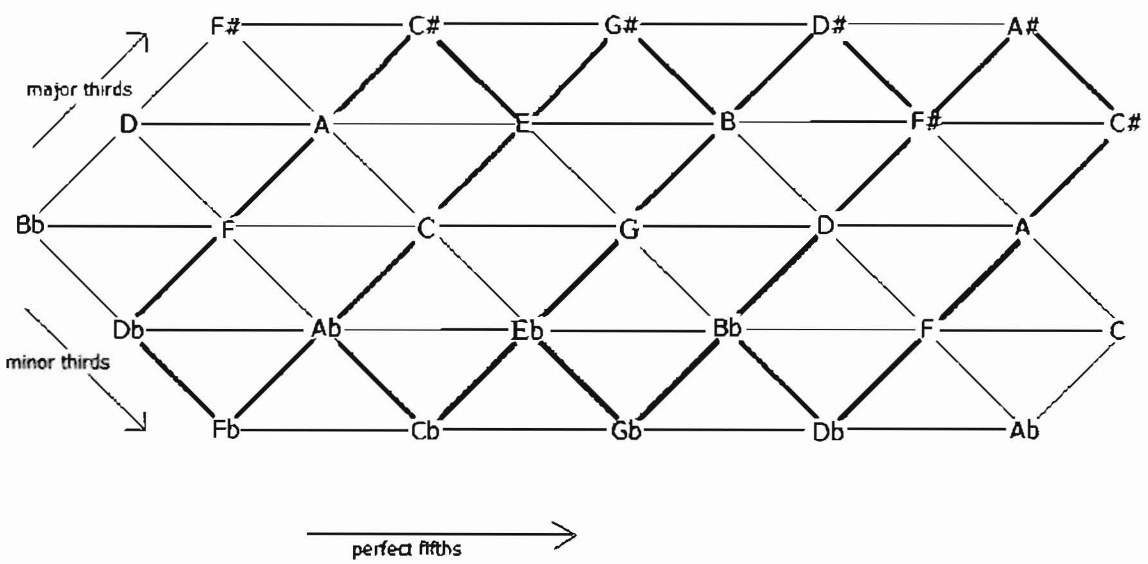


As you can see, F-major, D-minor, Bb-major, G-minor, and C-major are all connected on the tonnetz. What makes this passage even more interesting is that for the first eight measure of the song, F-major and Dminor are the only two sonorities that occur in the piano accompaniment. Then, in measure 9, there is a dissonance present in the F-major chord – E, followed by Bb-major in the left hand, and then the strange C-major--G-minor sonority. This shift in accompaniment coincides with the vocal line "sous ta brise et tes parfums" ("beneath your breeze and your fragrance"). In this line, the words "brise et" ("breeze and") sound like the word "brise", which means break; the F-major—D-minor pattern is literally broken by the text at

this point. An overall examination of this passage shows that movement between the chords, and even the co-occurrence of them makes much more sense when described according to the tonnetz. So to summarize, the tonnetz as presented by Hyer and Lewin is a transformational tonal space in which analytical reliance on root relationships is replaced by considerations of common-tone movement and spatial proximity.

My third theoretical father, Richard Cohn, remakes Lewin and Hyer by refining the view of tonnetz transformations. Cohn identifies in those transformations something he calls "parsimonious voice leading". To quote Cohn, "whenever a motion between triads involves retention of two common tones, [and] the single 'moving' voice proceeds by step"[9]. Cohn was especially interested in progressions where the single moving voice progressed by semi-tone, which can be represented on the tonnetz as movement from the bottom left to the top right corners. As shown in Figure 4, Cohn highlights four "alleys" that contain all the twenty-four possible major and minor triads.

Figure 4. the Tonnetz highlighting Cohn's 4 "alleys"



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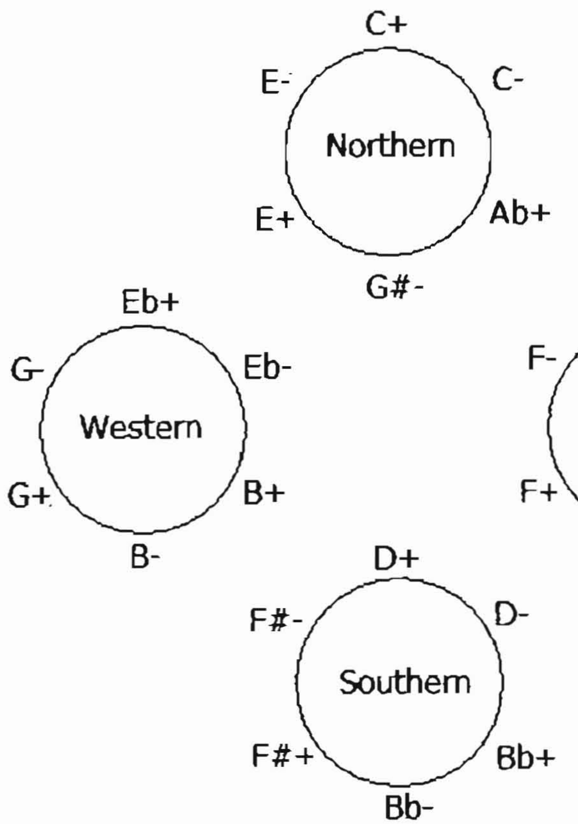
[9]Cohn, 1998, 174.

In his respatialization of the tonnetz, Cohn creates what he calls the hyper-hexatonic system, shown in Figure 5, in which each of the four alleys now appears as a circular space:

Figure 5. Cohn's Hyper-Hexatonic System[10]



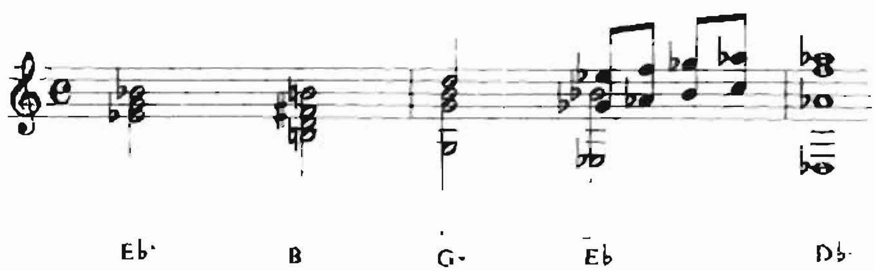
The four circles are labeled according to their geographic locations on the page: Northern, Eastern, Southern, and Western, and each letter on the circle represents a consonant triad, not just a single pitch; so C+ is a C-major triad, E- is an E-minor triad. The organization of the four semi-tone alleys with respect to each other comes from their contents' proximity on the tonnetz. As you can see, the alleys that are next to each other on the tonnetz are also next to each other in Cohn's circular tonal space; the far left alley is the Eastern circle, the alley to the right of that is

[10] Cohn, 1996, 17.

the Northern circle, the next alley to the right is the Western circle, and the far right alley is the Southern circle.

Cohn's rethinking of the tonnetz serves to strengthen the idea that 19th century triadic progressions may be best understood not by their relationship to a given root, but by their proximity on the hyper-hexatonic system. The hyper-hexatonic system is an important extension of this idea because it allows for hierarchical analysis of common-tone relationships. Movement within each of the circles (what Cohn calls "the forces of unity") is distinguished from movement between the circles ("the forces of diversity"). Cohn has now given us a visual way to represent the distinction between semitone and whole tone movement. Using the hyper-hexatonic space, and subsequent work based on it, Cohn presents convincing analyses of many passages of 19th century chromatic music. For example, the passage from Wagner's *Parsifal* shown in Example 3 illustrates movement through a single hexatonic system (the forces of unity)[11]: the passage begins with an Eb-major chord, moves to B-minor, G-major, and finally Eb-minor. All of these chords appear within the Western hexatonic space. The Db-minor chord breaks the pattern, shifting from the Western to the Eastern circles.

Example 3. Wagner, *Parsifal*, Act. III, bars 1098 ~ 1102 ('sanfte Erleuchtung des Grales')



[11] Cohn, 1996, 23.

A more complex example comes from Liszt's piano transcription of Polonaise I from his unfinished oratorio *Die Legende der heiligen Stanislaus*[12], shown in Example 4.

Example 4. Liszt, Polonaise I from *Die Legende der heiligen Stanislaus*, bars 98-110

[12] Cohn, 1996, 29.

Whereas the *Parsifal* example illustrated movement through only one of Cohn hexatonic circles, Liszt's Polonaise moves alternately through two different circles. The opening two chords, E-major and C-minor, are opposite each other on the Northern system. The next two chords that appear are F#-major and D-minor, which occur in the same positions on the Southern system. The Ab-major and E-minor chords in measure 106 brings us back to the Northern system, and this is once again mirrored in the next measure by the Bb-major and F#-minor chords. The next measure, once again, returns to the Northern system with the final two chords of that system, C-major and G#-minor. Based on the pattern up to now, we would expect the next measure to contain the missing two sonorities from the Southern system. But instead, Liszt gives us a tonal cadence on E-major. Cohn suggests that the G#-major triad in measure 108 ends the hexatonic sequence, and that Liszt takes advantage of G#-minor's position in the E-major scale (the key signature of the piece) to lead into a traditional tonal cadence on E-major. Cohn describes the overall motion of this piece as a "contrasting generative [path] through the hexatonic system"[13]; this passage is illustrative therefore, of both the "forces of unity" and "the forces of diversity".

Cohn's development of the hyper-hexatonic system represents an important refinement of the spatial thinking of Lewin and Hyer: where Lewin and Hyer describe movement on the tonnetz, but don't discuss the geographical location of this movement in the tonnetz space, Cohn codifies movement by organizing triads into smaller, geographically specific groups. Cohn allows for a further categorization of movement by separating the four "alleys" of the tonnetz. By describing "the forces of unity" and "the forces of diversity", Cohn furthers the spatialization of tonal space that Lewin and Hyer began with the tonnetz.

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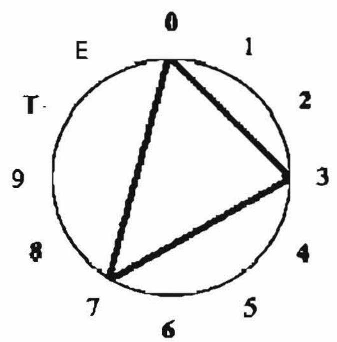
[13]Cohn, 1996, 25.

Like any prophet with a powerful message, Cohn has earned a large crowd of disciples who see the potential for extending his work beyond the triadic world and adapting it for the study of what one might call classically post-tonal music; the music of Berg, Webern, and Schoenberg, for example. One particularly vocal disciple, and my fourth theoretical father, is Michael Siciliano. His recent article, "Toggling Cycles, Hexatonic Systems, and Some Analysis of Early Atonal Music", from the Fall 2005 issue of Music Theory Spectrum, adapts certain aspects of Cohn's triadic transformational approaches in order to address the gap that seems to exist in this music between harmonic content and linear process. Siciliano also uses Lewin's transformational theory as the basis for his original work. But he points out that because the transformations of Lewin, Hyer and Cohn are based on movement between consonant triads, their use is limited to the analysis of 19th century triadic music, but are not applicable to post-tonal music. In order to overcome this limitation Siciliano remakes the preceding trio of theorists with yet another musico-spatial model. As shown in Figure 6, Siciliano first uses conventional integer notation to organize the twelve pitch classes into a circular space and represents trichords as triangular spaces within the larger circular space.

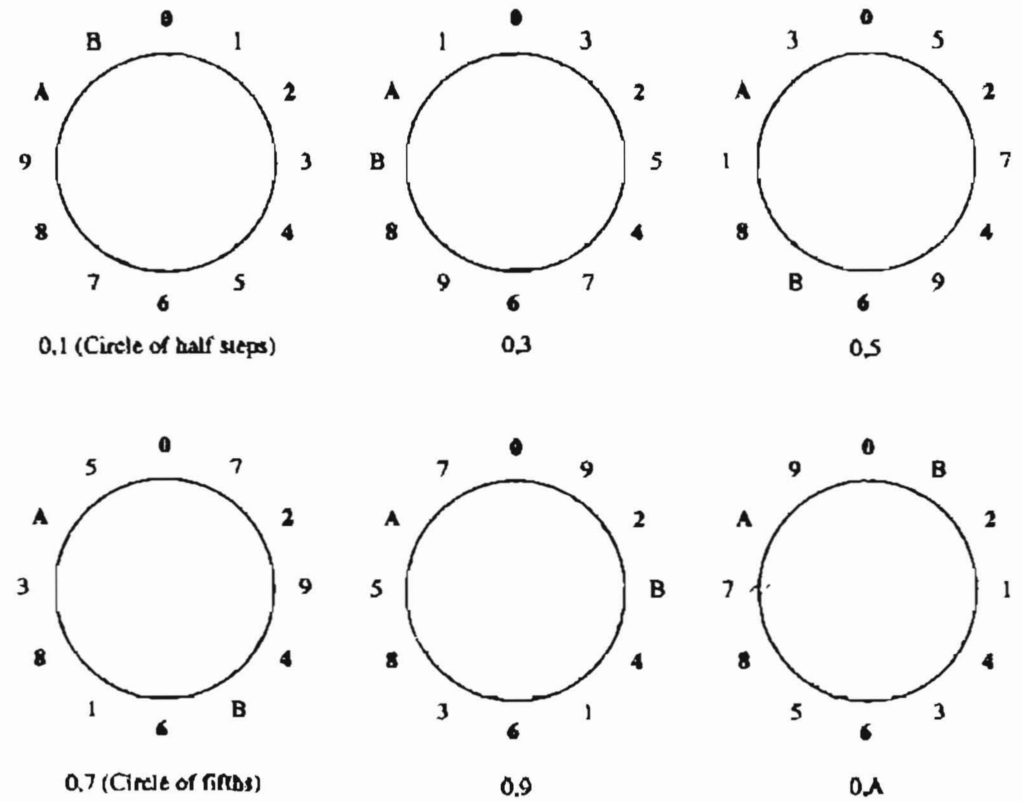
Figure 6. Siciliano's Circular Pitch-Class Space with C-minor triad highlighted



This re-spatialization allows Siciliano to not only show consonant triads, but any three-note group, or trichord.

Siciliano then divides the twelve pitch classes into the two whole-tone collections (even and odd numbers) and rotates the collections with respect to each other, thus generating six unique circular spaces, shown in Figure 7.

Figure 7. Siciliano's 6 Unique Pitch-Class Circular Spaces[14]



Siciliano now has a system of six circular spaces on which he can represent various trichords and transformational operations – and unlike Hyer, Lewin, and Cohn, this theoretical father is able to define movement between trichord types other than the consonant triad. Using his spatialization, Siciliano takes a basic neo-Riemannian transformation – the R operation – and applies it to the contents of his circular pitch-class spaces. The R operation, when applied to a consonant triad, transforms that triad into its relative major or minor. Figure 8 shows the R

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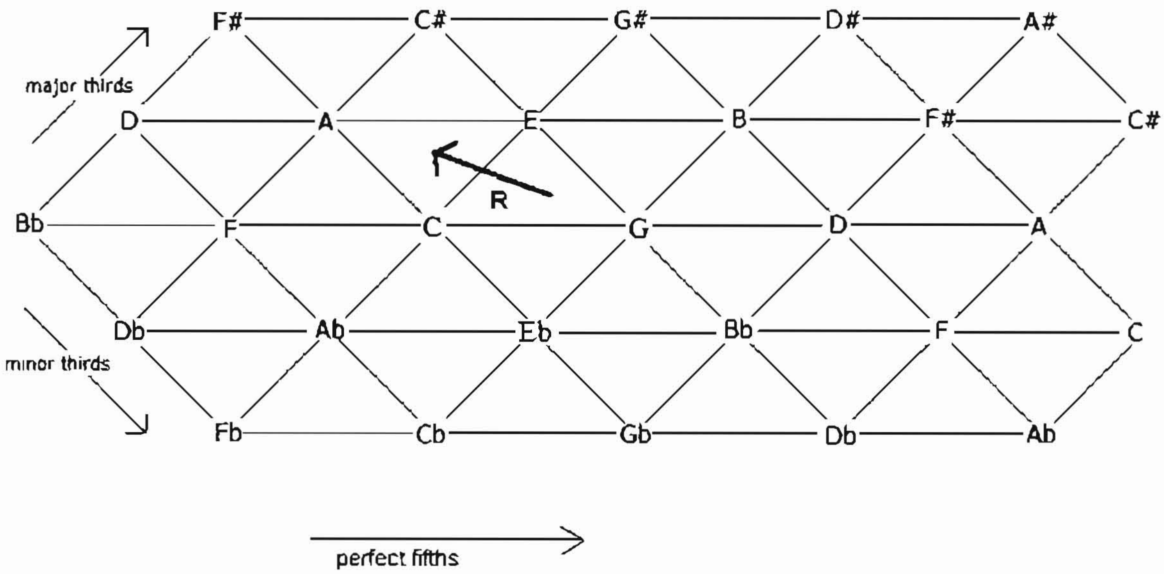
[14] Siciliano, 241

operation represented on the Tonnetz. As you can see, applying R to a C-major triad maps the G onto A, resulting in an A-minor triad – the relative minor of C-major.

Figure 8. the R operation shown on the Tonnetz



The R operation thus works in a way similar to Cohn's "parsimonious voice leading" – when applied to a given trichord, two tones are held in common, while one tone moves by step. Siciliano focuses on the R operation because it is the only Lewinian transformation that causes the moving voice to progress by whole step, rather than semi-tone. This whole step movement is what allows for transformation between different set classes. Rather than applying this operation to consonant triads on the tonnetz however, Siciliano applies it to triangular trichordal spaces within his circular spaces of ordered pitch classes. This results in what he refers to as the R template. For his analytical purposes, Siciliano is interested in the transformative relationships among three trichord types: the consonant triad – in integer notation [037] or [047], and the [014]

and [015] trichords: for example, {C, C#, E} and {C, C#, F}, respec5tively[15]. Siciliano's limited but powerful analytical game demonstrates that the R operation provides a way of transforming these trichords into one another thus shedding light on some post-tonal secrets.

Siciliano uses the R template to analyze the opening four measures of Arnold Schoenberg's op. 11, no.1 piano piece, shown in Example 5.

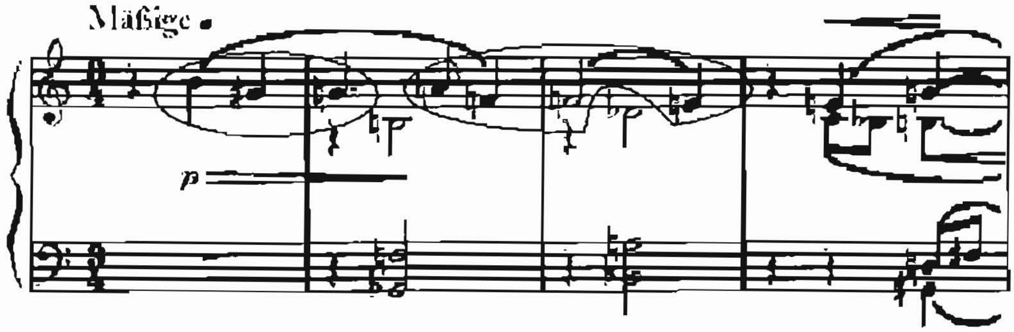
Example 5. Schoenberg, op.11, no.1, bars 1-4

Siciliano describes the opening gesture of the piece as two suspension-like figures: the G in measure two "resolves" to the F, which is already present in the lower chord. In the same way, the F of measure three "resolves" to the E. Of course, for those of you familiar with Joseph Straus's writings on post-tonal voice leading, you will perhaps recognize the basic problems with describing either of these figures as a "suspension" [16]. But that aside, Siciliano proceeds to explain this passage in terms of a series of R transformations. Not surprisingly, he divides the opening melody into two trichords: {B, G#, G} and {A, F, E} (example 6).

[15] Siciliano chooses these trichords in an earlier section of his article because of their ability to generate Cohn's hyper hexatonic system through what Siciliano calls "toggling cycles". For a complete discussion of this process, see Siciliano, 2005.

[16] the figure must be described as "suspension-like" rather than as a suspension. As Joseph Straus points out in "The Problem of Prolongation in Post-Tonal Music", 1987, the definition of a suspension is reliant on the presence of consonance and dissonance. In a post-tonal musical work where there is no defined consonance, there can be no suspension.

Example 6. Schoenberg, op.11, no. 1, bars 1-4: melodic trichords {B, G#, G} and {A, F, E}



Because the R template changes only one pitch class at a time, Siciliano cannot relate the two trichords directly, but carves a tortured segmentation path through the lower sustained chords to get from the beginning to the end of the passage. Thus for Siciliano, in order to get from the first melodic trichord to the second, shown in Example 7, the initial {B, G#, G} is transformed to {B, G, Gb} – the low Gb in the left hand chord displaces the G# from the first measure, shown in Figure 9.

Example 7. Schoenberg, op.11, no.1, bars 1-4: Siciliano's segmentation of the opening transformation

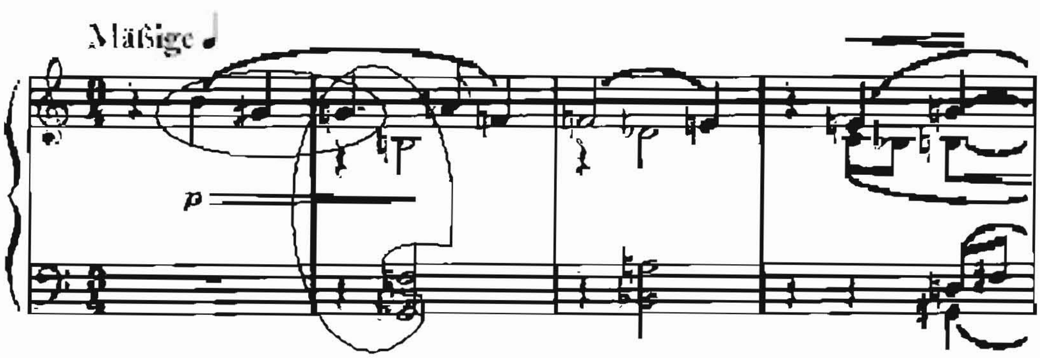
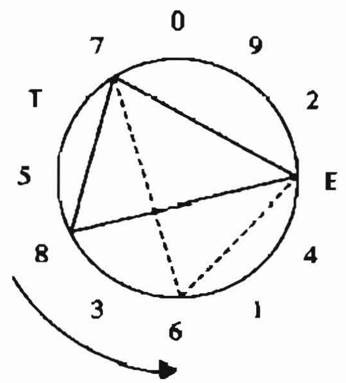


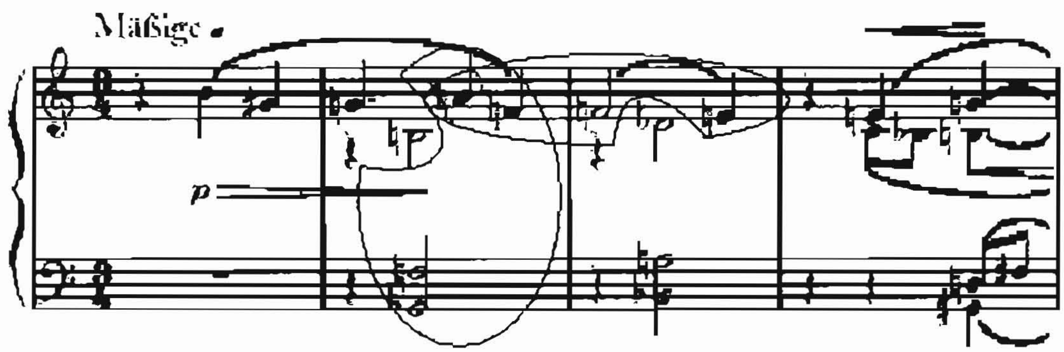
Figure 9. Siciliano's R template transforms {B, G#, G} to {B, G, Gb} on the 0,9 circle[17]



The initial {B, G#, G} trichord is represented as the bold triangle on the 0,9 circle. B and G, or E and 7, remain the same, and G# or 8 moves around the circle to Gb or 6.

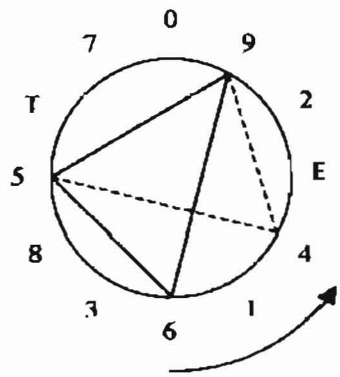
For Siciliano, the Gb, however, occurs as part of a new trichord, {Gb, F, A}. You're sure to notice this slightly strange segmentation shown in Example 8; it certainly appears problematic. When he again applies the R template, the Gb is displaced by the E of measure three, shown in Figure 10.

Example 8. Schoenberg, op.11, no.1, bars 1-4: Siciliano's segmentation of the second transformation



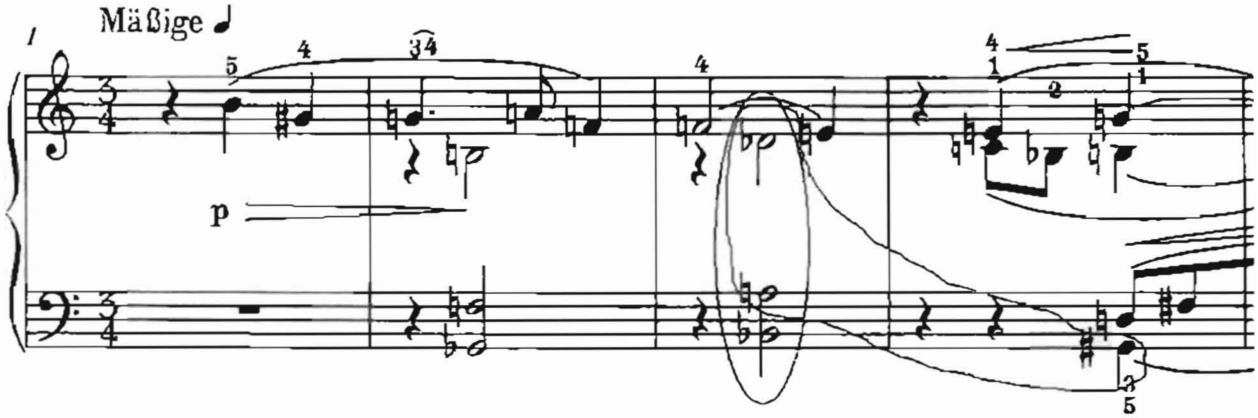
[17] Siciliano, 245.

Figure 10. Siciliano's R template transforms {Gb, F, A} to {A, F, E} on the 0,9 circle[18]



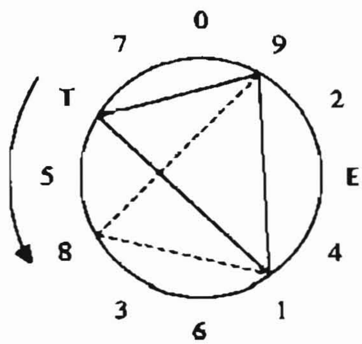
Siciliano therefore understands the E not as the result of a suspension-like figure, but as the result of a series of R operations on the 0,9 circle. In addition, Siciliano states that just as the sustained chord in measure two introduced the Gb that prepared for the E of measure three, the second sustained chord also prepares for the material of measure four, shown in Example 9: when the R template is applied to the {Bb, A, Db} trichord of measure three, the Bb moves to G#, which appears in the bass in measure four, shown in Figure 11.

Example 9. Schoenberg, op.11, no.1, bars 1-4: Siciliano's segmentation of the third transformation



[18] Siciliano, 245.

Figure 11. Siciliano's R template transforms {Bb, A, Db} to {Db, A, G#} on the 0,9 circle[19]

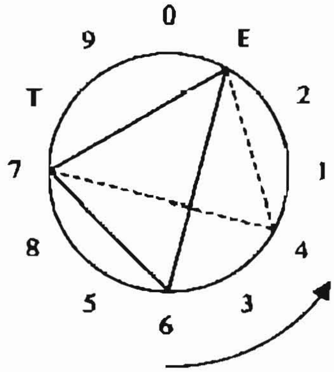


Siciliano also presents a "more abstract observation"[20] in which he explains the final E in the melody by transforming the opening {B, G#, G} trichord to a {B, E, G} trichord, shown in Example 10. Siciliano uses two different circles (0,9 and 0,11) to achieve this transformation: the first transformation is identical to the transformation shown in Figure 9 – {B, G#, G} maps to {B, G, Gb}. As shown in Figure 12, Siciliano then represents the {B, G, Bb} trichord on the 0, E circle, where application of the R template maps this trichord to {B, E, G}.

Example 10. Schoenberg, op.11, no.1, bars 1-4: Siciliano's segmentation of his "abstract" transformation

[19] Siciliano, 245.
[20] Siciliano, 245.

Figure 12. Siciliano's R template transforms {B, G, Gb} to {B, E, G} on the 0,E circle[21]



Although Siciliano recognizes that it may be counterintuitive to associate the final E with the initial B and G, he suggests that the right hand of measure four supports the relation. Siciliano sums up the usefulness of the R template with the following: "Thus we can understand the entire passage a presenting a series of R-template transformations. These transformations highlight the transpositional relations suggested by the melody, account for the structure of the chords, and profile E as the culmination of the R-template process"[22].

Now if you're confused, you should be! Unlike Cohn's virtuosic work on triadic post-tonality, work in which there seems to be little left without some sort of compelling and clear explanation, Siciliano's Cohn-inspired post-tonal work, while certainly provocative and innovative, seems to me to somehow miss the mark; too many things are left unasked and unanswered. I agree with Siciliano's initial assessment that the piece starts off with two melodic figures over lower sustained chords. However, one look at his explanatory segmentation of the transformational logic of the passage, shown in Example 11—that tortured winding through the supporting chords— would seem to be enough to show that it is perhaps a bit too counterintuitive, too abstract – that's not how you would hear, or perhaps even want to hear this music.

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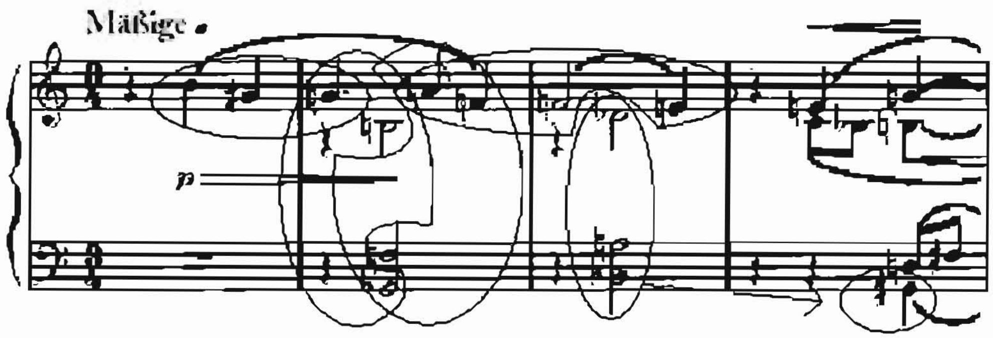
[21] Siciliano, 245.
[22] Siciliano, 246.

Example 11. Sicliano's segmentation of Schoenberg's op.11, no.1, bars 1-4



Siciliano is forcing us to see and hear the music through the single narrow lens of his R template – but the music doesn't seem to want to conform. For me, the two opening melodic phrases need to relate directly.

Thus, my task now is to add my own link to the chain of refinement and remaking that began with Lewin and Hyer's tonnetz thinking, was succeeded by Cohn's refinement of their work, and Siciliano's subsequent remaking of Cohn's transformational work. I need to get something new to grow from the music-theoretical ground these theoretical fathers have been tilling, and, with all humility, elbow my way to the theoretical foreground. I will establish my new position at the head of the line by revisiting specific things Siciliano tries to make us see and hear in Schoenberg's music. For though I do not think that the use of Siciliano's R template results in a convincing analysis, I do believe that his basic conceptual idea has promise. So to use an old cliché, as I begin my "remaking" of Siciliano's thinking, I'm not about to throw out the baby with the bathwater.

The first inspiration for my own conceptualization of musical space comes from J. Philip Lambert's work on the music of Charles Ives[23] which I encountered last year in Music Theory IV. Lambert views Ives' tonally unconventional harmonic and melodic language as the product

[23] Lambert, 1990.

of interval cycles – that is, the repetition of a single interval used to create harmonic and melodic structures; for example, if you're using interval cycle five, your harmony might consist of C-F-Bb-Eb. Unlike Siciliano however, Lambert does not limit himself to a one-size-fits-all approach. For he also includes the possibility of "combination cycles" to examine harmonic and melodic material generated by the alternation of two different interval cycles; for example, building harmonies with an alternation of perfect fourths and major seconds, or interval classes 5 and 2. Anybody who reads Lambert's work will see what a powerful and revealing idea this is, and that the cyclic combination of intervals seems to have been an asset to Ives because it allowed for the production of systematic variety. The French philosopher Jacques Derrida transposes and further refines this kind of combination idea in his arguments against any reliance on simple binary oppositions which he sees as a handicap to Western thought, musical and otherwise[24]. For Derrida, the truth or "a" truth lies only in what is produced or recognized by the tension between terms or ideas – what he calls "différance"[25]. Transposing Derrida to a musical domain thus suggests to me that musical creation emerges not as the product of one musical paradigm– Siciliano's R template, for example, but, as I will show, from the interaction of competing elements.

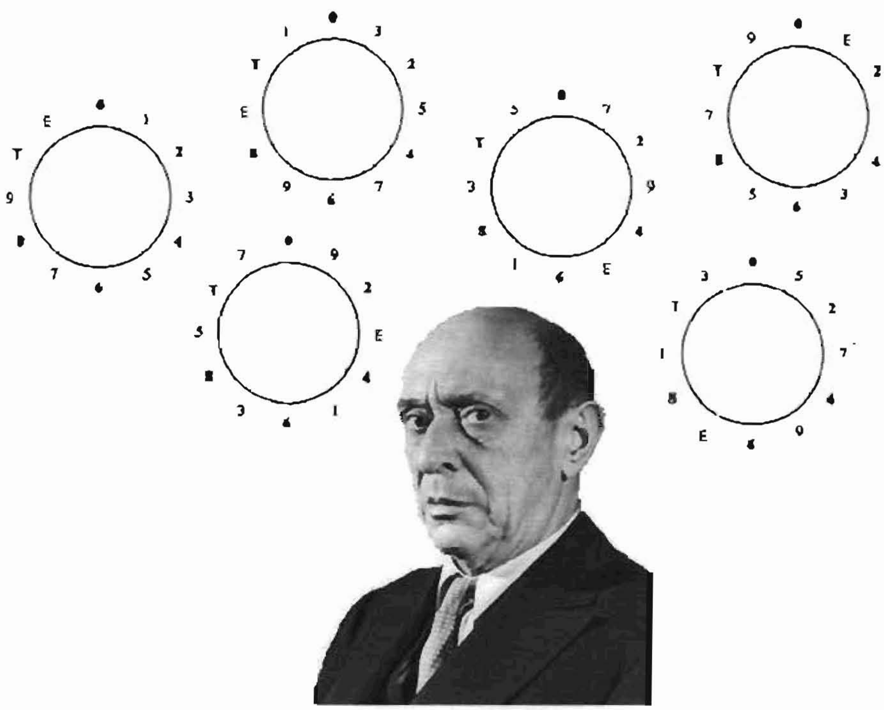
So here is my new link in the chain I've been following: I'm going to keep Siciliano's basic materials, but remake the character and mechanics of his musical spatialization. I would like to put forward an analytical procedure in which the logic of aspects of Schoenberg's op. 11, no. 1 reveals itself in the interaction of and tension between pairs of Siciliano's circular and triangular spaces. In order to understand my new conception of pitch-class space, we can't think

[24] Derrida describes these binaries as existing in unequal opposition; that is, one side of the pole is defined as a distorted or undesirable version of the other: evil is the corruption of good, absence is the lack of presence, death is the absence of life.
[25] Coward, 1990 and Derrida, 1981.

of static circles on a page, but instead, imagine how each circle represents a particular area in musical space, and each pitch class on the circle occupies a portion of that space. In my remade world there are six distinct circular areas that are sometimes just floating around, and sometimes interacting directly with each other.

Imagine, if you will, a composer's thought process: when I imagine Schoenberg composing this piece, I get a picture of a bunch of different ideas and compositional techniques bouncing around in his mind – sometimes influencing him individually, sometimes interacting with each other and producing new, perhaps unexpected ideas. I won't pretend to know what Schoenberg was thinking while he wrote this piece, but what I do get is a clear sense that there was more than just a single narrow window of inspiration. If we imagine Siciliano's pitch-class spaces interacting with each other much like the hypothesized compositional process I just outlined (Figure 13), I believe I can demonstrate that I have a new way to remake hearing and thinking about this piece.

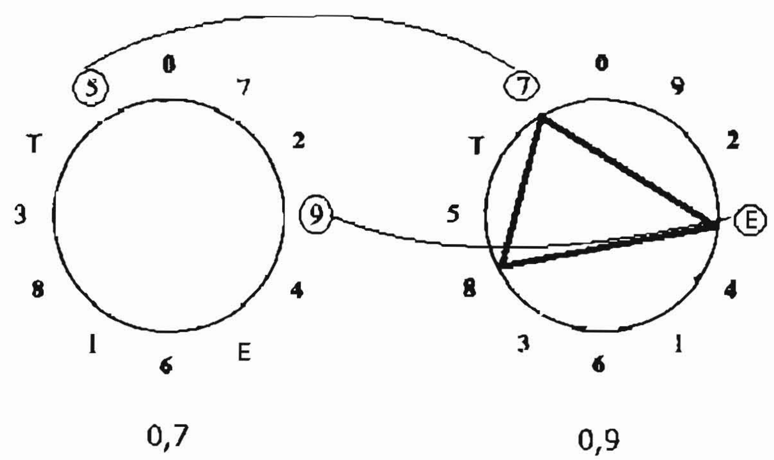
Figure 13. Schoenberg's hypothetical thought process



Where Siciliano relied on the use of one circular pitch space at a time for examining Schoenberg's work, I'm going to show how small-scale melodic movement and large scale musical form in op.11, no.1 reveal themselves when I imagine Schoenberg's musical creation emerging from two competing or interacting musical spaces, or what I refer to as "combination transformations".

You will perhaps recall that Siciliano tries to describe the opening gesture of op.11, no.1 as a series of distinct transformations occurring in a single circular pitch-class space, and how the results of that effort, as shown by the segmentation in my earlier example seemed counterintuitive. But now imagine a scenario in which that first 0,9 circular space somehow is able to interact with another of his circular pitch-class spaces – to begin with, the 0,7 circular space. When the two circles or ideas come together and form a new combined spherical space, the pitch classes that have been activated by the triangular trichordal space share their spaces with another pitch class: if you overlay the 0,7 on top of the 0,9 circle, shown in Figure 14 with the {B, G#, G} trichord from op.11, no.1, measure 1 highlighted on the 0,9 circle, the Eleven or B shares spatial identity and location with 9 or A and 7 or G shares spatial identity and location with 5 or F.

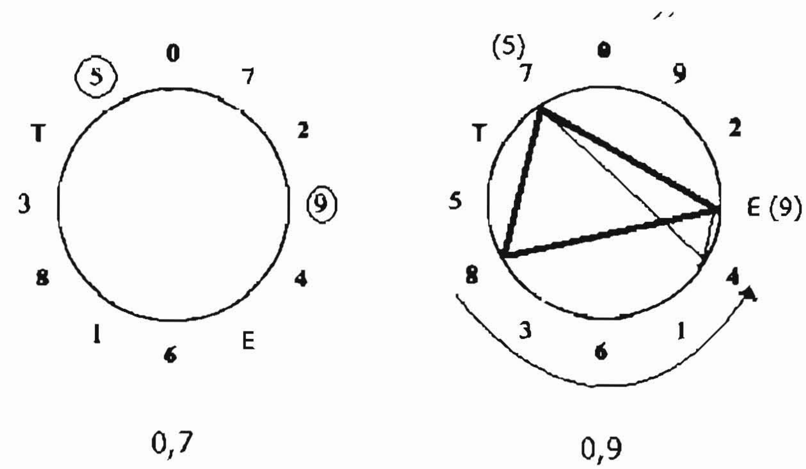
Figure 14. Interaction of 0,9 and 0,7 circular spaces



The pitch classes that are not activated by the triangular space within the circle remain dormant – they do not compete with new pitch classes. This sharing of space gives Schoenberg an option – an option that is only created by the combination of two circular spaces. Two of the elements from the inner triangular space will be compressed into a smaller space – the two pitch classes compete – and one displaces the other. But all of this activity happens within a single spatial position – so even though one pitch class displaces another, the elements maintain position in the circular area.

This reconceptualization now gives me a way to directly relate the piece's first two melodic figures, thus changing how I think about and hear them, while, like the R template, still only spatially shifting one pitch-class. With this spatial pairing, the B in the first motive is displaced by A in the second, G is displaced by F, and G# changes spatial position to E.

Figure 15. {B, G#, B} transformed to {A, F, E} through combination of 0,9 and 0,7 circular spaces



The initial {B, G#, G} trichord is represented as the bold triangle in the 0,9 circular space. When this space interacts with the 0,7 circular space, only the G#, or 8, moves around the circle to E, or 4, while the other pitch classes are displaced by pitch classes that share their space within the circle. The smaller, thin triangle represents the second melodic trichord, {A, F, E}.

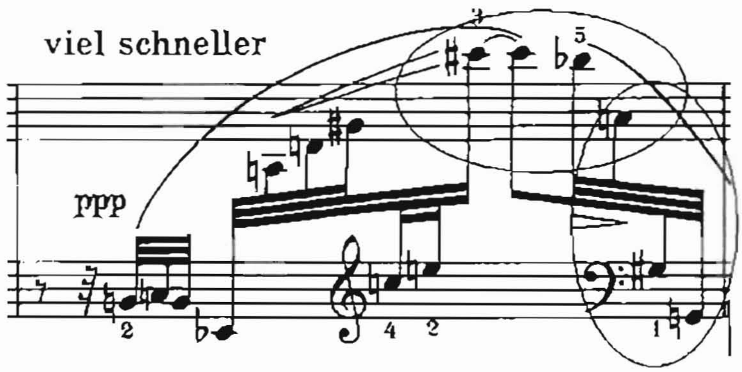
Like Siciliano's R template and Cohn's parsimonious voice leading, this interaction only involves one moving pitch class within the spherical space; all three notes do move to different pitches, but in terms of their spatial presentation, (and that's the crucial point) only one pitch class has moved. This spatial consistency suggests to me that Schoenberg is not just writing chords and melodies, but that Schoenberg, like Varese for example, has a highly acute and developed sense of musical and pitch-class space.

Now if you're really paying attention, you may notice that my operation looks slightly different from Siciliano's R operation. Most obviously, the triangles are different sizes. But the key is, like Siciliano, the combination transformations maintain spatial integrity. That is, each combination transformation begins with the shape of the bold triangle in Figure 15 and compresses to get the shape of the thin triangle – the same shape every time – two pitch classes retain their spatial position and while pitch class moves[26].

If we look a little further in the music, we see a slightly varied example of this type of musical movement that also maintains spatial consistency, shown in Example 12.

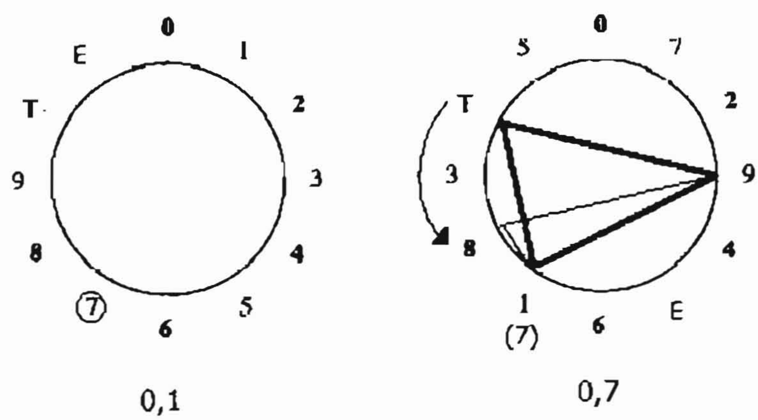
[26]The operation that defines the movement of the changing pitch class has changed from Siciliano's R operation slightly. While R is defined by whole-step movement, my operation is defined by the shape of triangular space that it generates. If we look at Siciliano's circles, he always uses the same type of triangle to represent trichords: a triangle with legs of lengths 3, 4, and 5. The R operation always acts on the pitch class joined by the lengths 3 and 5, and results in another 3-4-5 triangle. In my spatialization, I also begin with a 3-4-5 triangle, but instead of maintaining the same shape, my transformation acts on the same pitch class (joined by 3 and 5) and results in a triangle with legs of lengths 1, 4, and 7. Given any 3-4-5 triangle, there are two possible ways to generate a 1-4-7 triangle in this way: whole-step movement towards the 3-4 vertex, or movement by a major third towards the 4-5 vertex. So my operation could be either of these; it is defined by the move from a 3-4-5 triangle to a 1-4-7 triangle.

Example 12. Schoenberg, op.11, no.1, measure 12



The final gesture of this measure, starting with the high C#, can be segmented into two clear trichords: {C#, Bb, A} and {A, G#, G}. In this case, the A is common to both trichords, acting as a sort of pivot between the two groups. As shown in Figure 16, if we see the first trichord on the 0,7 circle, and then imagine it combining with the 0,1 circle in another spherical space, the C# of the first trichord competes with and is displaced by the G, the A competes with D#/Eb, but in this case the A is not displaced and remains in the new trichord, and the Bb changes spatial position within the 0,7 circle and maps onto G#.

Figure 16. {C#, Bb, A} transformed to {A, G#, G} through combination of 0,7 and 0,1 circular spaces



So here are two slightly different ways in which my combination transformations are able to describe small-scale motivic logic. And happily, they are also able to reveal large-scale

formal logic. For example, using musical texture as a guide it seems clear that measures 1-12 constitute a distinct musical unit or phrase (Example 13):

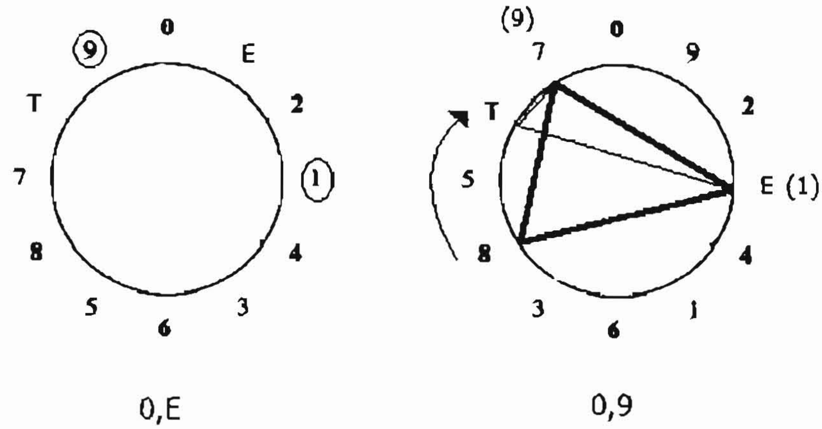
Example 13. Schoenberg, op.11, no.1, bars 1-13

Measure 12 acts as a sort of cadential flourish to the first 11 measures, culminating in the downbeat of measure 13, where new melodic material is introduced. And just as the A in measure 12 acts as a hinge between two trichords, measure 12 as a whole acts as a hinge between two contrasting sections, propelling the piece forward.

This phrase division is also identified by a combination transformation: the first trichord from measure 1 containing the opening's registral extreme shows a combination transformation relationship with the registral extreme at the close of this passage. As shown in Figure 17, if we

see the first three melodic notes {B, G#, G} again on the 0,9 circle, but this time interacting with the 0,E circle, rather than the 0,7 circle as before, the B is displaced by C#, the G is displaced by A, and the G# changes spatial position to Bb.

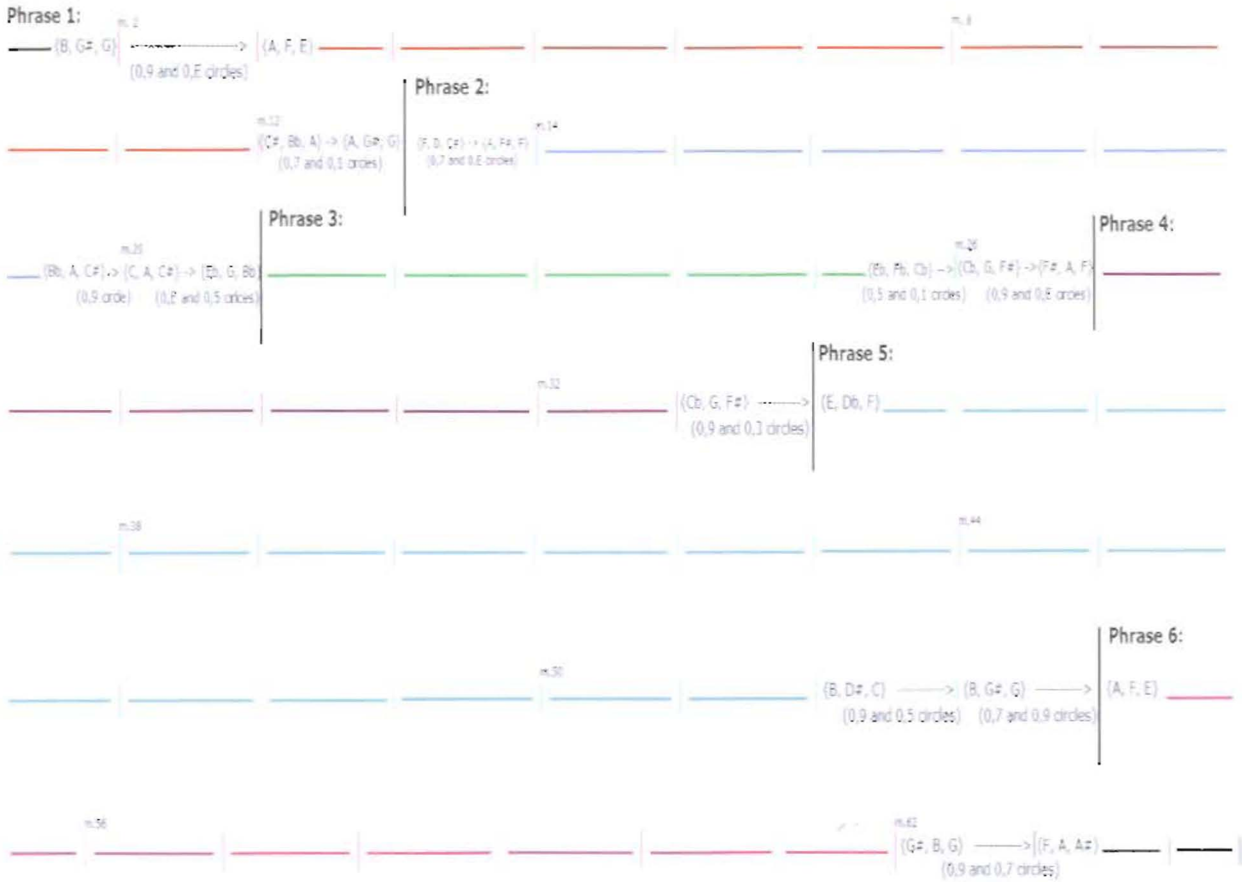
Figure 17. {B, G#, G} transformed to {C#, Bb, A} through combination of 0,9 and 0,E circular spaces



Reinforced by the textural shift in the music, this transformational connection suggests a conceptual and compositional logic that extends to the level of the musical form. If you continue application of my combination transformations, you will find that they reveal six distinct sections, or phrases in the first movement of Schoenberg's op.11, shown in Figure 18[27].

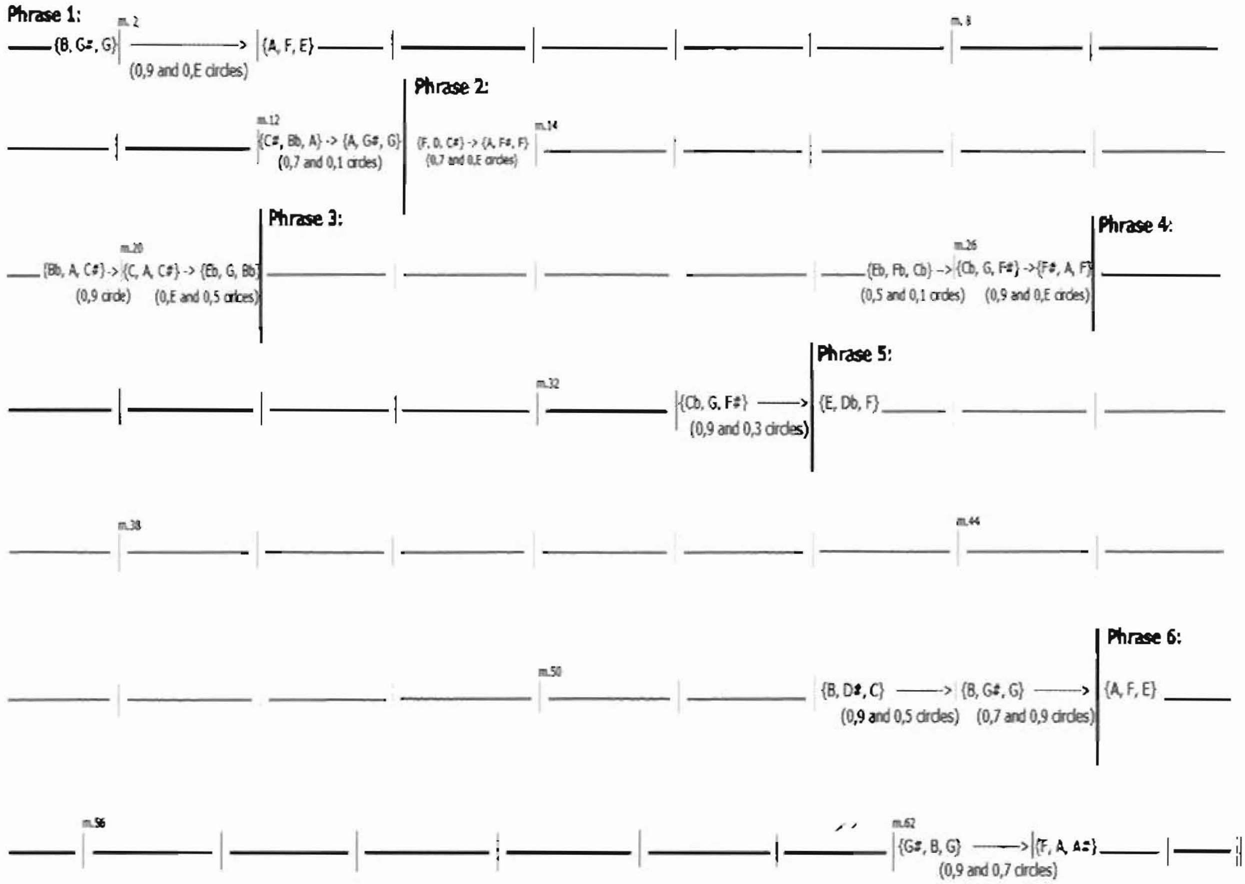
[27] For a complete analysis of op.11, no.1, see Appendix A.

Figure 18. Combination Transformation map of Schoenberg's op.11, no.1



Using textural changes as an analytical guide, my analysis shows how each phrase begins and ends with two elements related by a trichordal combination transformation and that the opening and closing trichords of each phrase are also related through another transformation. So the formal outline articulated by musical texture is reinforced by my little bit of spatial remaking. The combination transformations therefore reveal a harmonic, melodic, and formal logic in this movement in which six phrases emerge. Thus, hearkening back to Lambert and Derrida, in both subtle and powerful ways that don't ignore good old inspiration, some very original artistic creation and musical thinking can be productively viewed through my combination

Figure 18. Combination Transformation map of Schoenberg's op.11, no.1

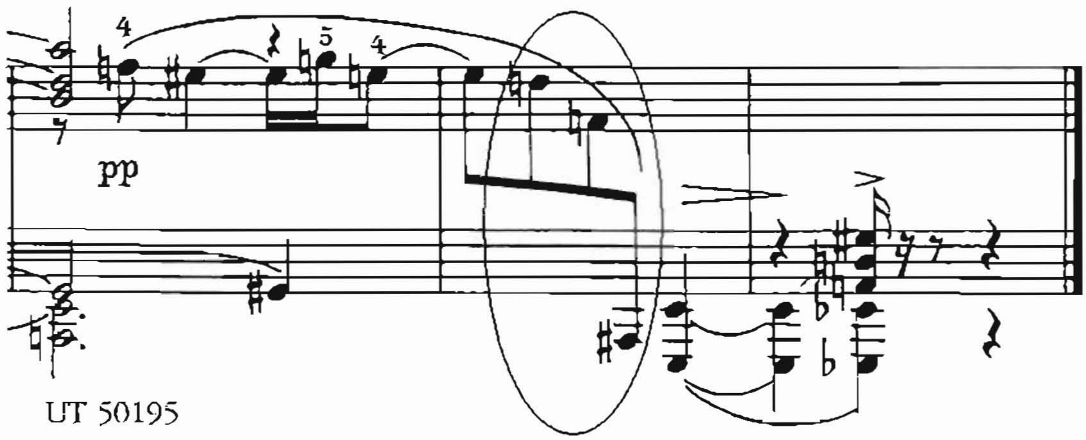


Using textural changes as an analytical guide, my analysis shows how each phrase begins and ends with two elements related by a trichordal combination transformation and that the opening and closing trichords of each phrase are also related through another transformation. So the formal outline articulated by musical texture is reinforced by my little bit of spatial remaking. The combination transformations therefore reveal a harmonic, melodic, and formal logic in this movement in which six phrases emerge. Thus, hearkening back to Lambert and Derrida, in both subtle and powerful ways that don't ignore good old inspiration, some very original artistic creation and musical thinking can be productively viewed through my combination

transformations as the systematically derived product of the interaction of competing conceptual spaces: my systematic "remaking", if you will.

Now it would be very nice, of course, if the last measure of this piece was the combination transformation and textural conclusion to a final phrase. But it seems that, like the Navajos, who for theological reasons intentionally weave a mistake into every blanket they make, the last measure of this piece (Example 14) seems wrong – it doesn't fit my scheme of combination transformation interplay.

Example 14. Schoenberg, op.11, no.1, bars 62-64



But the combination transformation concept has an answer. If you examine the opening of the second movement, shown in Example 15, you will see that the first three pitch classes that are heard in this movement, {F, D, Db} can be seen as the result of a combination transformation of the final melodic trichord of the first movement, shown in Figure 19. The {F, A, A#} trichord in the 0,3 circle interacts with the 0,E circle: F is displaced by Db, A is displaced by F, and A# changes spatial position to D.

Example 15. Schoenberg, op.11, no.2, bars 1-2

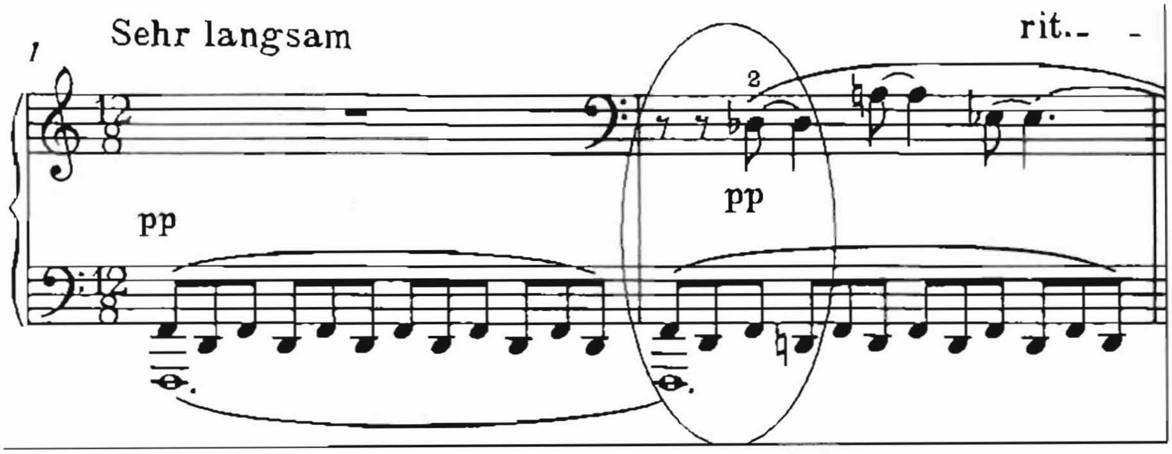
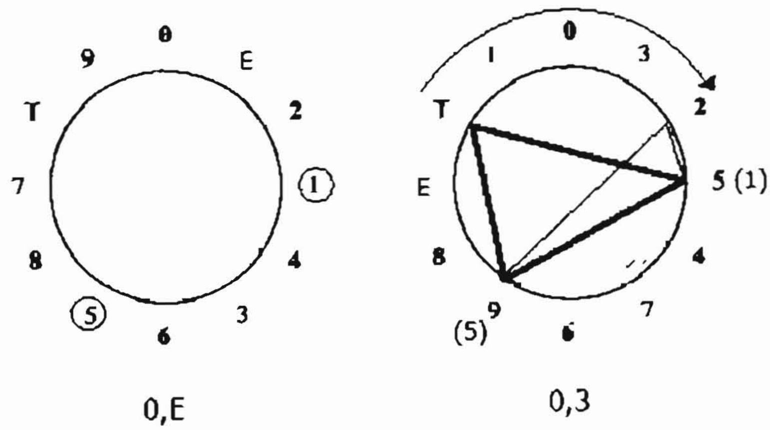


Figure 19. {F, A, A#} of movement 1 transformed to {F, D, Db} of movement 2 through combination of 0,3 and 0,E circular spaces



Thus my combination transformation game extends across movement boundaries and makes a logical spatial link between the closing of the first movement and the beginning of the second movement, a connection that again demonstrates the small- and large-scale abilities of my approach.

And so I close here. I hope that I've accomplished what I set out to do: make my own contribution to a long lineage of theoretical fathers who have thought about music in various spatially-centered ways. Though my own combination transformations are quite distanced from those in Lewin and Hyer's tonnetz space, I believe that I have continued this line of spatial

thinking by presenting an idea that allows us to understand some post-tonal music on a variety of levels: spatially, structurally, performatively, small- and large-scale, and across movement boundaries. This project has allowed me to combine contrasting musical and philosophical thinking in ways that suggest ties on all of these levels. But it, too, of course, leaves a number of things unasked – for example, is there a pattern or method in the combination of circles that might parallel aggregate completion in Schoenberg's tone row manipulations? Is his tone row thinking also played out in using these musical spaces? Is there a definitive logic that determines when pitch classes in a pitch-class space undergoing combination are displaced or retained? Could this spatial thinking be transposed to considerations of rhythm, or register? The time frame of this project did not allow sufficient time to address these questions; they are questions for a later date. But what I have done is develop a logic that combines pitch-class transformational theory and with a new approach to musical spatialization. And now that I've been in the front of the "respatialization line" for a brief time, I can't help but wonder – who will remake me? It certainly will happen at some point, so for now I'll have to make sure to look both ways before I cross the street, and hope that whoever comes along next prefers Straus's idea of "remaking" to Harold Bloom's idea of "killing".

Appendix

The combination transformation model can be seen throughout the first movement of op.11, and full analysis provides a structural framework around which the piece can be viewed: the movement is made up of six phrases that begin and end with combination transformations. Additionally, the beginning and end of each phrase is related through another combination transformation. The two melodic groups of the opening of op. 11, no.1, shown in Example 1, can be directly related through a combination of the 0,7 and 0,9 circular spaces, shown in Figure 1.

Example 16. Schoenberg, op.11, no.1, bars 1-3

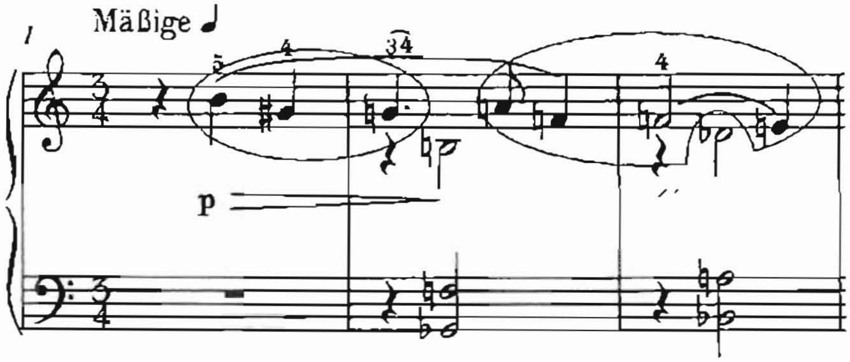
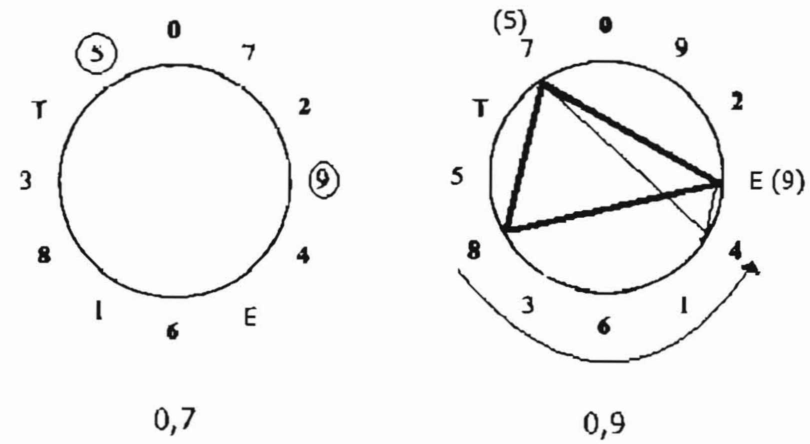


Figure 20. {B, G#, G} transformed to {A, F, E} through combination of 0,9 and 0,7 circular spaces



The end of this first phrase comes in the second half of measure 12 with the descending arpeggio, shown in Example 2. The {C#, Bb, A} transforms to {A, G#, G} with the A acting as a pivot between the two chords. As shown in Figure 2, the combination transformation is achieved by a combination of the 0,1 and 0,7 circular spaces.

Example 17. Schoenberg, op.11, no.1, bar 12

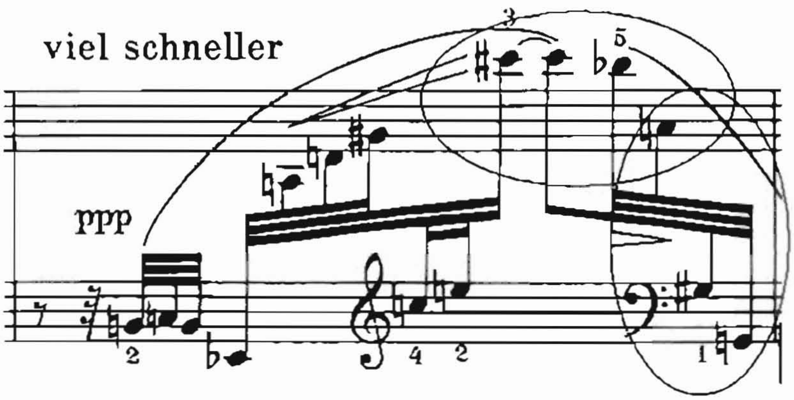
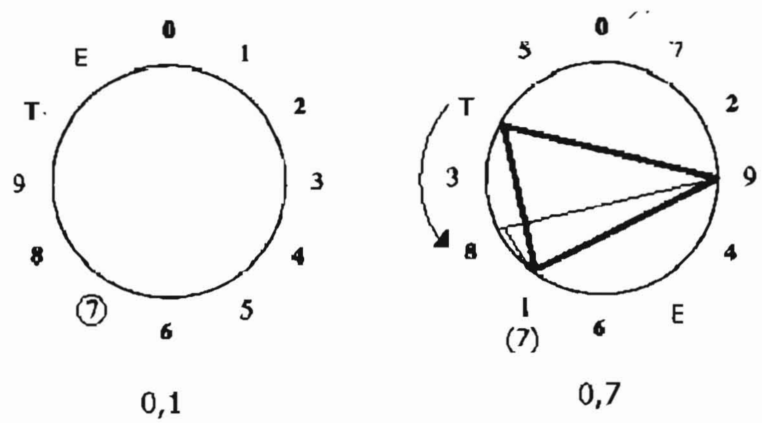
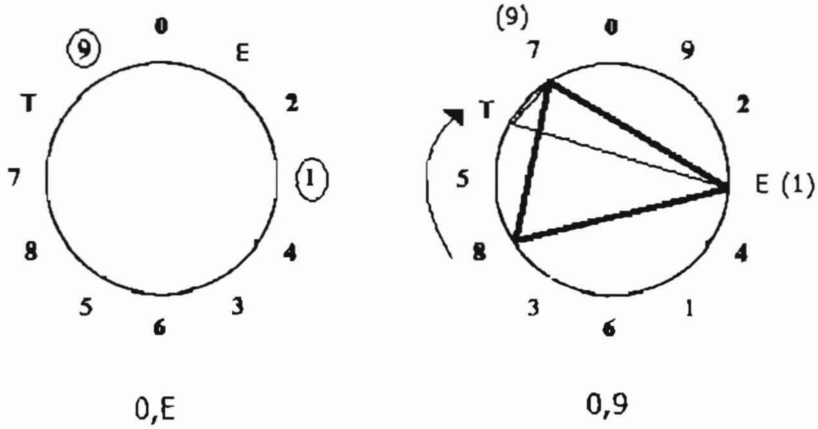


Figure 21. {C#, Bb, A} transformed to {A, G#, G} through combination of 0,7 and 0,1 circular spaces



The usefulness of the combination transformation method is further highlighted by the relationship between the phrase's opening and closing gestures; as shown in Figure 3, the first trichord of the beginning of the phrase, {B, G#, G} transforms to the first trichord of the closing of the phrase, {C#, Bb, A} through a combination of the 0, E and 0,9 circular spaces.

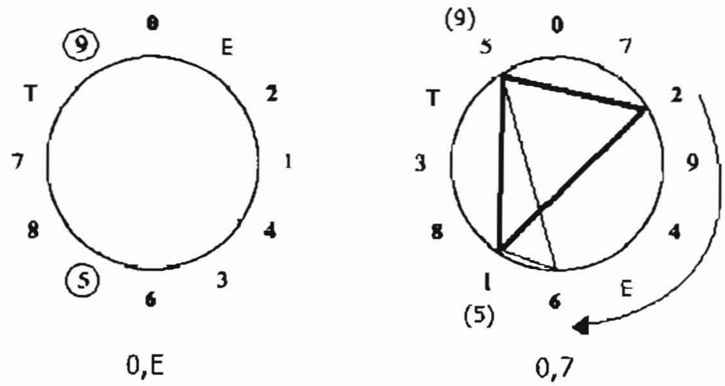
Figure 22. {B, G#, G} from m. 1 transformed to {C#, Bb, A} from m. 12 through combination of 0,9 and 0,E circular spaces



The second phrase begins in measure 13, shown in Example 3, with the right hand gesture: there are two four-note groups, and the last three pitches of each group, {F, D, C#} and {A, F#, F} are related through a combination of the 0,7 and 0,E circular spaces, as shown in Figure 4.

Example 18. Schoenberg, op.11, no.1, bar 13

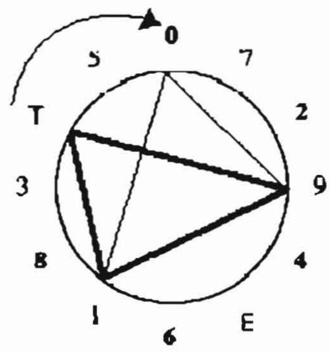
Figure 23. {F, D, C#} transformed to {A, F#, F} through combination of 0,7 and 0,E circular spaces



The end of the second phrase comes in measures 19-20, shown in Example 4. Here we see a two-part transformation: the first can be explained by Siciliano's R template, and the second by a combination transformation. The first transformation comes from the trichord on the last beat of m. 19, {Bb, A, C#} to the trichord on the downbeat of measure 20, {C, A, C#}, as shown in Figure 5. Because only one pitch class changes, this movement is explained by Siciliano's R operation. The second transformation, shown in Figure 6, starts with the same trichord from m. 20, {C, A, C#} and moves to the last three notes of that measure, {Eb, G, Bb}.

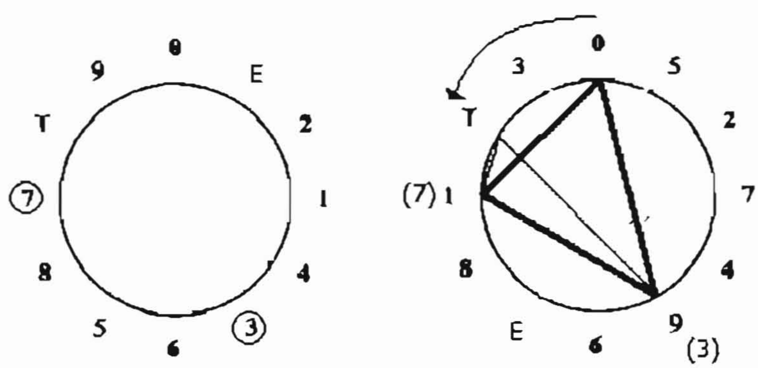
Example 19. Schoenberg, op.11, no.1, bars 18-20

Figure 24. {Bb, A, C#} transformed to {C, A, C#} with R operation on 0,7 circular space



0,7

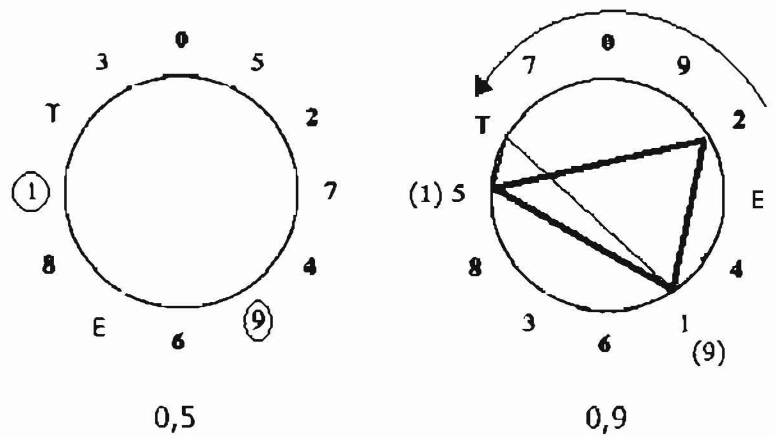
Figure 25. {C, A, C#} transformed to {Eb, G, Bb} through combination of 0,5 and 0,E circular spaces



0,E 0,5

Again, the gesture at the beginning of the phrase can be related to the end of the phrase with the combination circles. As shown in Figure 7, the {F, D, C#} trichord from measure 13 transforms to the {Bb, A, C#} trichord of measure 19 through a combination of the 0, 5 and 0,9 circular spaces.

Figure 26. {F, D, C#} from m. 13 transformed to {Bb, A, C#} in m. 19 through combination of 0,9 and 0,5 circular spaces



The gesture is measure 20 provides a clear closing to the second phrase, but it can also be seen as the opening of the third phrase; the two transformations serve to first end one phrase and then start another. The closing of the third phrase comes in measure 25-26, shown in Example 5, in another two part combination transformation that functions as an end to the third phrase and a beginning to the fourth phrase. The first combination transformation, shown in Figure 8, moves the first three notes of measure 25, {Fb, Eb, Cb} to the {Cb, G, F#} of measures 25-26, with the Cb acting as a pivot. The second combination transformation, shown in Figure 9, starts with the same {Cb, G, F#} trichord and moves to the first three notes in the left hand gesture of measure 26, {F#, A, F}, this time with the F# acting as a pivot.

Example 20. Schoenberg, op.11, no.1, bars 25-27

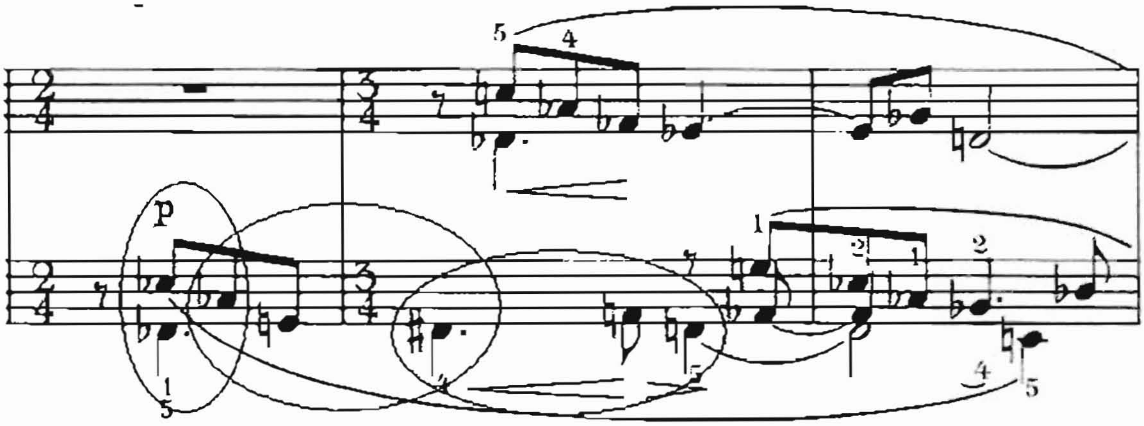


Figure 27. {Fb, Eb, Cb} transformed to {Cb, G, F#} through combination of 0,1 and 0,5 circular spaces

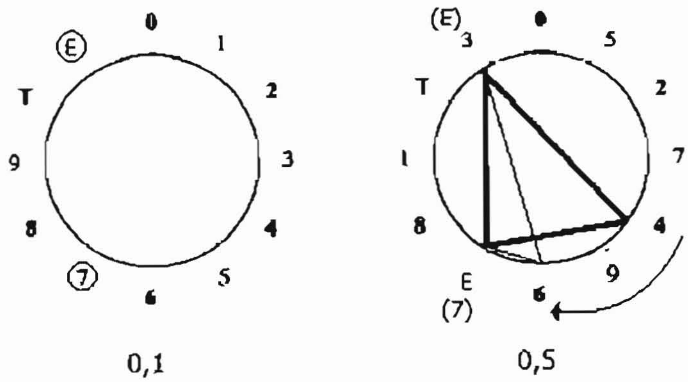
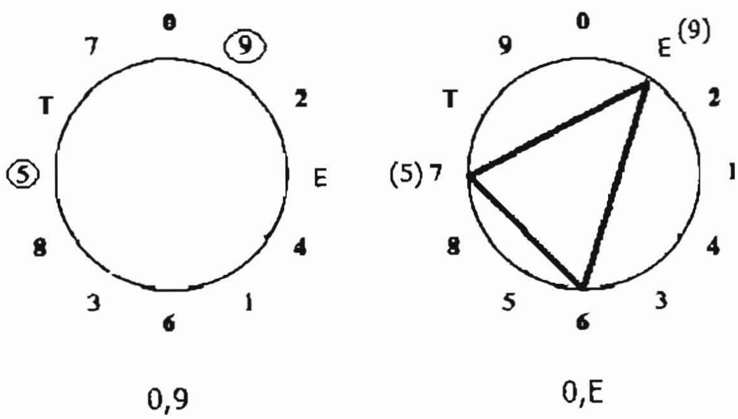
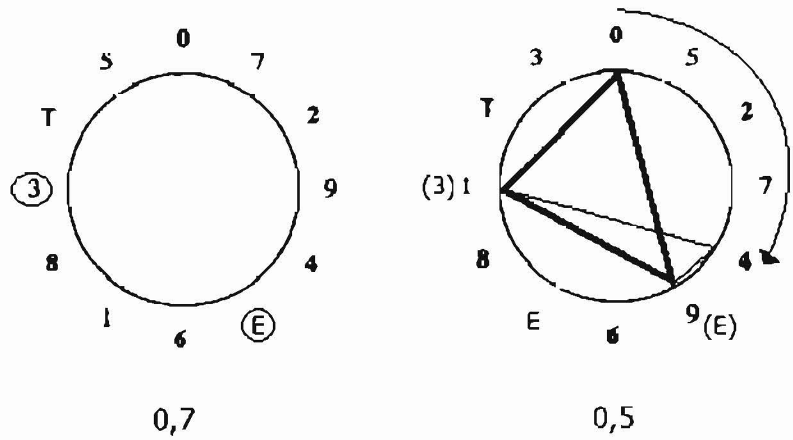


Figure 28. {Eb, G, F#} transformed to {F#, A, F} through combination of 0,9 and 0,E circular spaces



The connection between the beginning and end of the third phrase is seen in the transformation of the {C, A, C#} of measure 20 to the {Eb, Fb, Cb} of measure 25, shown in Figure 10.

Figure 29. {C, A, C#} of m. 20 transformed to {Eb, Fb, Cb} of m. 25 through combination of 0,7 and 0,5 circular spaces



The end of the fourth phrase comes in measures 33-34, shown in Example 6, and again also functions as the beginning of the fifth phrase. The last three notes of measure 33, {Cb, G, F#} transform to the first three notes of measure 34, {F, Db, F} through a combination of the 0,9 and 0,3 circular spaces, shown in Figure 11.

Example 21. Schoenberg, op.11, no.1, bars 33-34

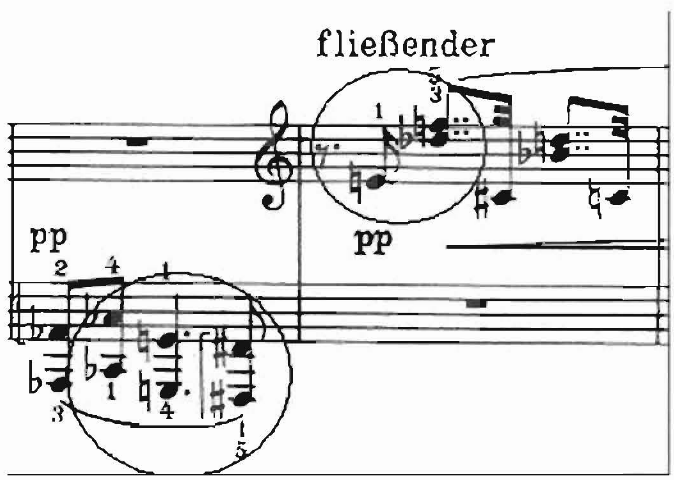
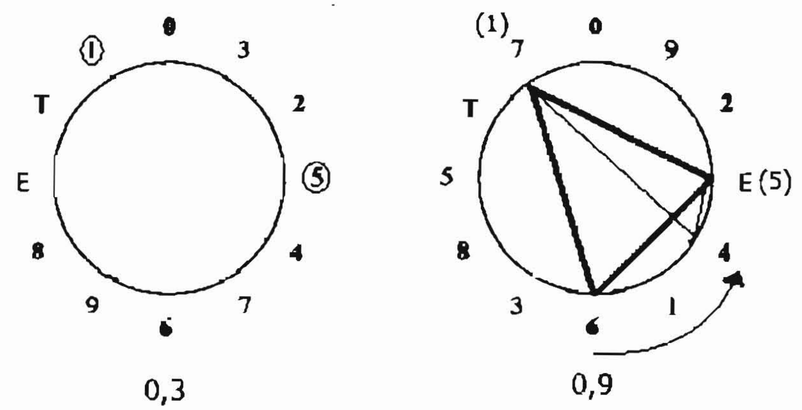


Figure 30. {Cb, G, F#} transformed to {E, Db, F} through combination of 0,3 and 0,9 circular spaces

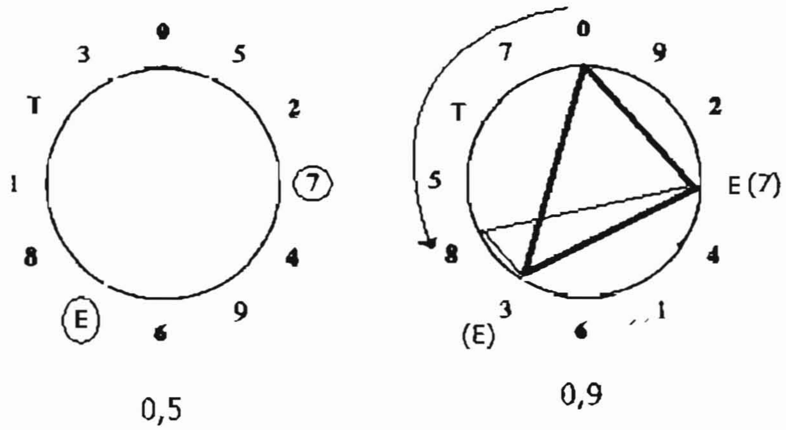


The first trichord, {Cb, G, F#}, is the same one that was seen in measures 25-26, and so the connection between the beginning and end of the fourth phrase is the same transformation that is illustrated in Figure 8: {Fb, Eb, Cb} in measure 25 is transformed to {Cb, G, F#} through a combination of the 0,1 and 0,5 circular spaces.

The end of the fifth phrase, which once again functions also as the beginning of the sixth phrase, comes in measures 52-53 with the return to the piece's opening motive, shown in Example 7. As shown in Figure 12, the trichord that occurs on the third beat of measure 52, {B, D#, C} transforms to the {B, G#, G} of measures 53-54 – the opening three notes of the piece. As in the first three measures of the movement, the {B, G#, G} trichord is then transformed to the {A, F, E} trichord that occurs in the top voice of the right hand in measure 54-55 (shown previously in Figure 1).

Example 22. Schoenberg, op.11, no.1, bars 52-55

Figure 31. {B, D#, C} transformed to {B, G#, G} through combination of 0,5 and 0,9 circular spaces



The connection between the beginning and end of the fifth phrase can be seen in two ways: the {E, Db, F} trichord from measure 34 transforms to both the {B, D#, C} trichord of m.52, shown in Figure 13, and the {B, G#, G} trichord of measures 53-54, shown in Figure 14.

Figure 32. {E, Db, F} of m. 34 transforms to {B, D#, C} of m. 52 through combination of 0,5 and 0,7 circular spaces

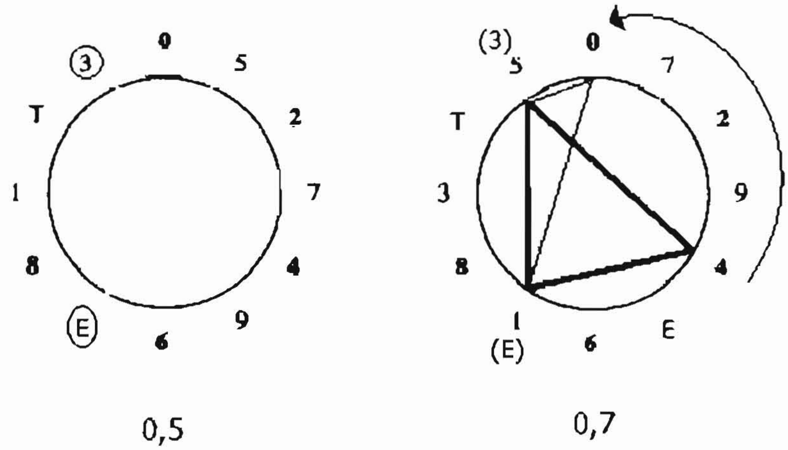
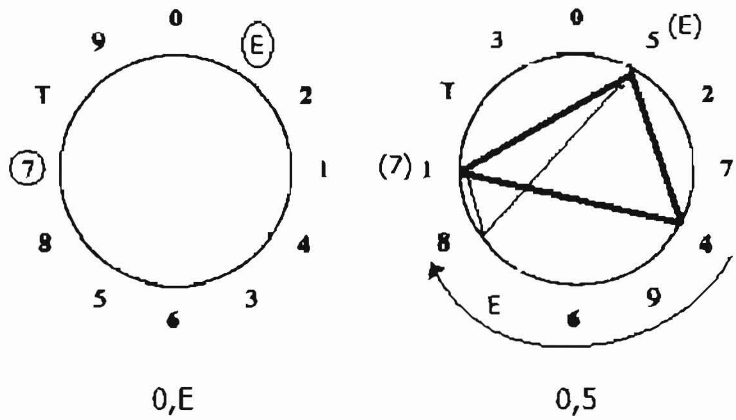


Figure 33. {E, Db, F} of m. 34 transforms to {B, G#, G} of m. 53-54 through combination of 0,5 and 0,E circular spaces



The return to the opening gesture of the movement suggests the beginning of a sixth and final gesture, which ends in measures 62-63, shown in Example 8. The last three notes in the right hand of measure 62, {G#, B, G} – another return to the opening gesture of the movement – transform to the {F, A, A#} of measure 63, shown in Figure 15.

Example 23. Schoenberg, op.11, no.1, bars 62-64

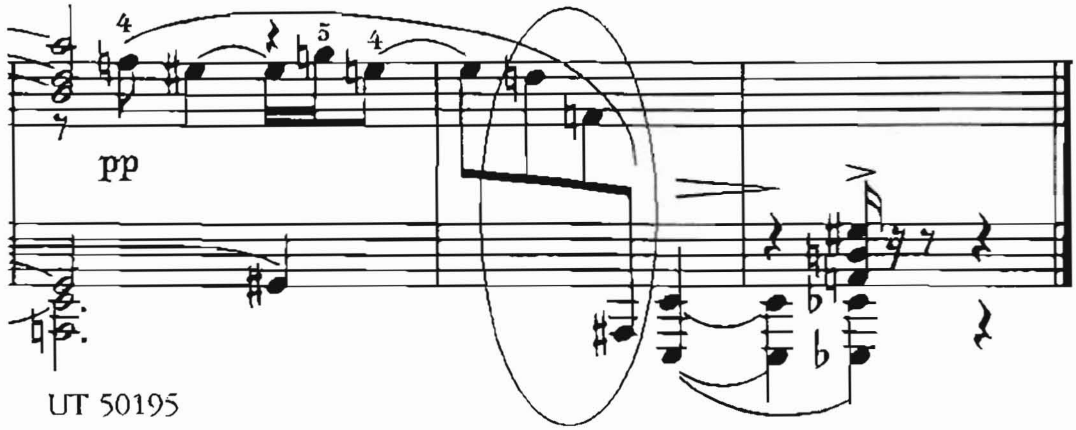
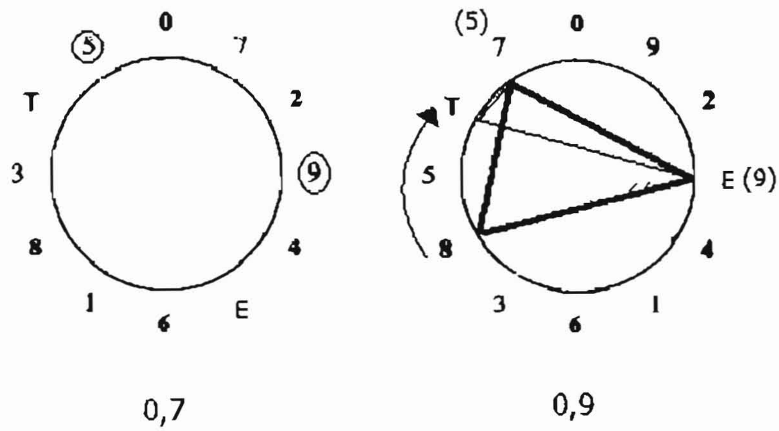


Figure 34. {G#, B, G} transforms to {F, A, A#} through combination of 0,7 and 0,9 circular spaces



The final gesture of the piece – the last beat of measure 63 and measure 64 (Example 8) – does not fit into the combination circle model, but it can be seen as a sort of punctuation after the final phrase ends. The final trichord of the last phrase is important not only as the end of the phrase, but as a connection to the second movement. In the second measure of op.11, no.2, shown in Example 9, the first three notes are {F, D, Db}, which is a transformation of the {F, A, A#} trichord in measure 63 of the first movement, shown in Figure 16; the combination circles

allow not only for an outline of the first movement, but also suggest a relationship between the movements.

Example 24. Schoenberg, op.11, no.2, bars 1-2

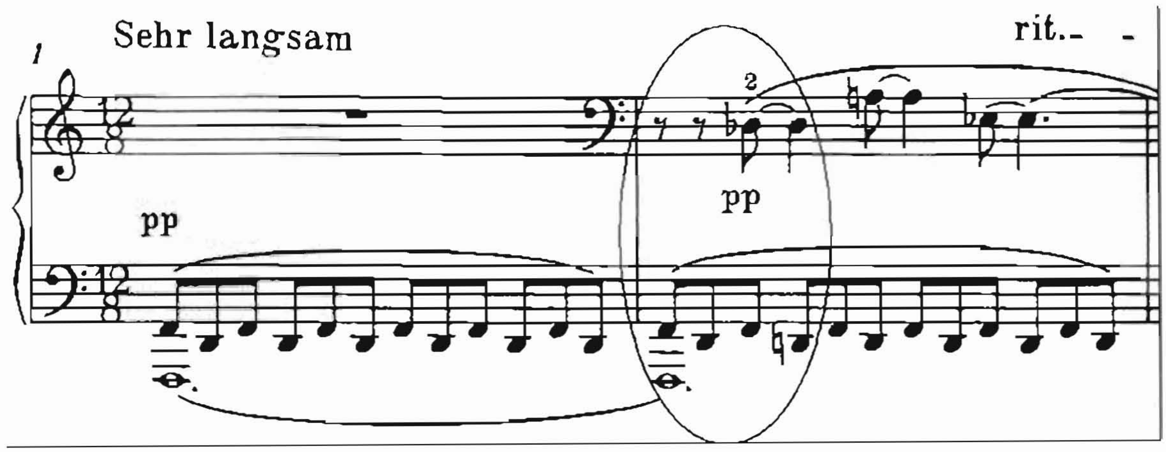
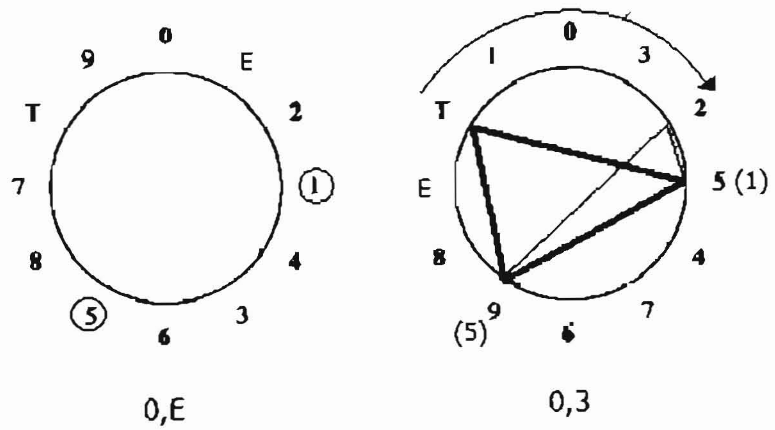


Figure 35. {F, A, A#} of no.1, m.63 transforms to {F, D, Db} of no.2, m.1-2 through combination of 0,E and 0,3 circular spaces



The use of combination circles has resulted in a framework of op.11, no.1 in which six distinct phrases emerge – each one defined by the occurrence of one or more combination circle transformations at the beginning and end of the phrase, and a transformational relationship between the opening and closing of the phrase. By expanding Siciliano's thinking to include combination circles, a more comprehensive understanding of Schoenberg's work is possible.

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