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TRIADIC TRANSFORMATION AND HARMONIC COHERENCE IN THE MUSIC OF GAVIN BRYARS

Recent developments in music theory have offered new ways of analyzing and interpreting music that uses major and minor triads differently than in traditional dominant-tonic tonality. Neo-Riemannian theory, developed and adapted from the dualist theories of Hugo Riemann (1849-1919), is perhaps the most noteworthy example. It incorporates some types of triadic successions, especially those involving changes of mode and root-change by third, into a coherent formal system that can be useful for analyzing a variety of musical genres.[1]

However, there is still a broad class of triadic compositions that this theory does not satisfactorily describe. Consider, for instance, Example 1, taken from Rehearsal A of the Second String Quartet of the prominent contemporary British composer Gavin Bryars (b. 1943). The example shows the cello arpeggiating a series of triads that change every two measures; the roots and qualities of the triads are labeled below the score as appropriate.[2] The other three instruments often support the triadic chord tones in the

[1] For example: David Lewin, "A Formal Theory of Generalized Tonal Functions," *Journal of Music Theory* 26/1 (1982): 23-60; Brian Hyer, "Reimag(in)ing Riemann," *Journal of Music Theory* 39 (1995): 101-138; Richard Cohn, ""Maximally Smooth Cycles, Hexatonic Systems, and the Analysis of Late Nineteenth-Century Triadic Progressions." *Music Analysis* 15 (1996): 9-40; Guy Capuzzo, "Neo-Riemannian Theory and the Analysis of Pop-Rock Music," *Music Theory Spectrum* 26/2 (2004): 177-200. Guy Capuzzo, "Pat Martino's 'The Nature of the Guitar': An Intersection of Jazz Theory and Neo-Riemannian Theory," *Music Theory Online* 12.1 (2006).
[2] Note that in all examples, "M" refers to a major triad, and "m" refers to a minor triad.

cello, but sometimes add other pitch classes that can be understood as passing or neighboring tones. Properties of this passage suggest the possibility of a neo-Riemannian analysis: the cello chords are consistently triadic; the progressions are not traditionally tonal; and some changes, like C major to C minor, which involves a *Parallel* transformation, are neo-Riemannian. However, such an analysis, when considering the entire passage, is inconsistent, and does not provide a satisfactory account of the compositional process taking place. For example, the first change of this passage, from E minor to C minor, is not one of the basic neo-Riemannian operations (P, L, or R), but a composite (LP). We could understand the change more directly as a *Terzschritt* in the *Schritt/Wechsel*-group formulation of Riemannian theory, but that and other *Schritt* operations do not appear in the rest of the passage.[3] Following this change is the succession that raised our expectations: a short *Parallel*-chain, which transforms C minor to C major and back again. But the rest of the passage contains transformations for which the standard neo-Riemannian operations provide a rather indirect account. For example, the change from E minor to A♭ major, and from B minor to E♭ major, each occurring twice in the passage (mm. 29-36 and mm. 37-44 respectively), must be expressed as a product of three basic Riemannian-transformations: PLP or LPL (see Example 2).[4] These two chord pairs are related by perfect fifth, which could raise the question as to whether or not we should regard this transposition as an integral, basic operation. Furthermore, there is no evidence (possibly except for the alteration of C major to C minor) that the

[3] Lewin, "A Formal Theory of Generalized Tonal Functions," 23-60. Henry Klumpenhouwer, "Some Remarks on the Use of Riemann Transformations," *Music Theory Online* 0.9 (1994). Hyer, "Reimag(in)ing Riemann," 101-138.
[4] This is the "hexatonic pole" relation treated in Cohn, "Maximally Smooth Cycles," 19.

transformation from one triad to another is also its own inverse transformation (indicated in the example by the lower, right-facing arrows), as must be the case with P, L, and R.

A theoretical approach to such analytical issues is a 2002 article by Julian Hook.[5] In this article, entitled "Uniform Triadic Transformations," Julian Hook proposes a transformational theory within a single, simple algebraic structure that encompasses all of the neo-Riemannian transformations, along with a variety of other triadic transformations. He defines a "uniform triadic transformation" (henceforth UTT) as an operation that acts on the collection of major and minor triads. Each UTT affects all major triads the same way and all minor triads the same way (but possibly in a different way than major triads), as explained in Example 3. They are expressed in the form <+, *m*, *n*> or <–, *m*, *n*>: the + or – indicates whether the operation preserves or reverses the mode of the triad, respectively; the integers *m* and *n* indicate the pc-interval of transposition *of the root* (mod 12) if the triad is major or minor, respectively. Example 4 provides some examples of UTTs.

It should be noted, as Hook indeed points out, that from any given triad to another the UTT is not uniquely determined. For example, the transformation from C major to E minor *could* be <–, 4, 8> (the neo-Riemannian *Leittonwechsel*-transformation), but it could also be <–, 4, *n*>, where *n* is any pc-interval. Hook addresses this issue by drawing attention to those subgroups of UTTs that are simply transitive, and which he calls K (*a, b*). If we restrict the possibility of triadic transformations to the UTTs in one of these subgroups, then there is only one possible way to analyze the succession of any two

[5] Julian Hook, "Uniform Triadic Transformations," *Journal of Music Theory* 46 (2002): 57-126.

triads. Example 5 names all of the K (*a, b*) simply transitive subgroups, and derives the UTTs that belong to one of them, called K (1, 1). The mode-preserving members of the K(1,1) subgroup are simply the twelve transpositions, while each of the mode-reversing members transposes the roots of all major triads by *n* and the roots of all minor triads by *n + 1*. These mode-reversing members are not as familiar as the neo-Riemannian transformations; for instance, <–, 10, 11> transforms D major to C minor, and C minor to B major.

To date, critics have mostly limited their study of Bryars to the social, cultural and political aspects of his work, paying little attention to his compositional procedures.[6] One analytical survey of Bryars's music describes "progression from one chord … to the next by …way of an enharmonic pivot" as a "veritable fingerprint" of the composer's mature style.[7] This interpretation could suggest hearing the chords in the context of keys, where one tonal area is "pivoting" to another. I find such prolongational tonality difficult to hear even locally in works such as the Second String Quartet (Example 1). A more detailed analysis conducted by Richard Bernas goes to the other extreme.[8] He asserts that much of the "harmony" found in the recent works of Bryars is the result of "polyphonic rather than harmonic relationships."[9] Furthermore, many of Bryars's harmonic progressions involve voice leading that is exclusively parsimonious (in which every voice moves by

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[6] Richard Barrett, "Avant-Garde and Ideology in the United Kingdom Since Cardew." In *New Music: Aesthetics and Ideology/Neue Musik: Ästhetik und Ideologie,* ed. Mark Delaere (Wilhelmshaven: Noetzel, 1995), 170-181.
[7] Andrew Thomson, "The Apprentice in the Sun: An Introduction to the Music of Gavin Bryars," *The Musical Times* 130/1762 (1989): 725.
[8] Richard Bernas, "Three Works by Gavin Bryars." In *New Music 87,* ed. Michael Finnissy and Roger Wright (New York: Oxford University Press, 1987), 34-42.
[9] Ibid, 34.

common tone, semitone, or whole tone), often accounting for Bryars's smooth transitions between non-diatonically related chords.[10] Moreover, citing Bryars's experience as a jazz double-bass player and improviser, Bernas claims that Bryars's music consists of simpler chord progressions that are "obscured or enriched" by non-harmonic tones.[11] With this I agree, and acknowledge that this conception could be used to analyze Bryars's melodies and, more specifically, those tones that seem to stand "outside" of any given harmonic/triadic context. Consider Example 6, a passage from Bryars's First String Quartet (1985). Bernas calls attention to the C-to-C scales played by the violins. They are constantly being inflected with different accidentals, beginning with a flattened scale-degree 2, followed by a flattened scale-degree 5, then flattened scale-degrees 2 and 5 together, and so on. Bernas says, "the permutation of these scales, winding slowly up and down over a fairly static ground of pedal Cs and harmonized in blissfully non-functional ways, creates the most bewildering and hypnotic experience in Bryars's recent music."[12] Though I find Bernas's scalar analysis plausible, his dismissing of the harmony as "blissfully non-functional" is rather passive. In this regard, I seek a more systematic basis for these types of progressions, a basis in which Bryars's harmonic writing could be heard as structurally coherent.

There are many passages in Bryars's music where at least one of the instruments provides a harmonic support that is almost exclusively triadic (for example, the Cello Concerto (1995), "After the Requiem" (1990), and the String Quartets 2 and 3 (1998)).

[10] Douthett and Steinbach, "Parsimonious Graphs: A Study in Parsimony, Contextual Transformations, and Modes of Limited Transposition," 241-263.
[11] Bernas, "Three Works by Gavin Bryars," 35.
[12] Ibid, 40.

However, as noted above, many of these progressions are not traditionally tonal, and there are questions about whether a neo-Riemannian framework is adequate and appropriate. To explore the possibility of understanding this music with UTTs, let us now examine the Second String Quartet in more detail.

In the first section, shown in Example 7, a repeated rhythm of an eighth-note followed by a long duration announces the change from one triad to the next. Three voices participate in this aspect of the texture; the fourth voice (initially Violin 1, later Violin 2, and then Viola) moves more freely, in or out of the prevailing triad. The first triad presented in this way is F♯ minor (m. 3), and the root of the chord that follows (B♭ minor) is 4 semitones above it. Reading the opening chord (mm. 1-2) as E♭ minor, as suggested by the resolution of the F to G♭ between violin II and violin I, I can hear an ascending-fifth root-progression between the first and third chords with no change of mode. This hearing is confirmed by the subsequent music: two chords after the B♭ minor triad there is an F minor triad, followed two chords later by a C minor triad that is followed two chords later by a G minor triad. The same ascending-fifth progression of minor triads is demonstrated briefly between the fourth and sixth chords of the section (F♯ minor and C♯ minor). Beginning on the seventh chord of the section (C minor), another progression becomes apparent, in which the roots of the chords change alternately by major and minor thirds (+4 semitones, +3 semitones), and the modes of the chords alternate between major and minor. Since this second progression maintains the transposition by ascending-fifth that is apparent in the earlier part of this passage, I am inclined to regard all these triadic changes as part of a single, coherent transformational system.

Such a system is evident in one of the special groups of UTTs that Hook labels K(*a,b*) described earlier. The ascending-fifth relationship that occurs between every second chord can be labeled by the UTT <+, 7, 7>, a mode-preserving transformation that transposes the roots of both major and minor triads by 7 semitones. The mode reversals and root changes by alternating major and minor third that occur between the final four chords of the section can all be labeled <–, 3, 4>, a mode-reversing transformation that transposes the roots of major triads by 3 semitones, and the roots of minor triads by 4 semitones. Of the K(*a,b*) subgroups of the UTT group, only K(1,1) contains both <+, 7, 7> and <–, 3, 4>.

It is easy to see that this set of operations includes an identity element and inverses. The identity operation is <+, 0, 0>. Every mode-preserving operation has an inverse within the set (for example, the inverse of <+, 7, 7> is <+, 5, 5>), and every mode-reversing member has an inverse within the set (for example, the inverse of <–, 3, 4> is <–, 8, 9>). The set of operations is also closed, as can be observed in Example 8, which analyzes the entire first section using only members of K(1,1). Here, one may observe how the product of any two transpositions results in another transposition; for instance, <+, 8, 8> and <+, 11, 11>, compose to <+, 7, 7>. Similarly, the product of any two mode-reversing operations makes a transposition. For example, <–, 3, 4>^{2} results in <+, 7, 7>, and, between the last three chords of this section, the composition of <–, 3, 4> with <–, 0, 1> results in <+, 4, 4>, the inverse of the <+, 8, 8> that transforms the third chord of the section to the fourth. More generally, Example 8 asserts that during this passage there is a characteristic transformation, <+, 7, 7>, which is articulated into two successive mode-preserving operations during the first half of the passage, and into two successive mode-reversing operations during the second half of the passage, such that all operations belong to K(1,1).

With this analysis in mind let us now look at the harmonic progression used in Rehearsals A and B of the second section. Example 9 provides a reduction of the progression as it occurs between measures 21 and 76. It begins on an E minor triad that is arpeggiated in the cello. This chord lasts for two measures, as does each of the following chords. I hear this passage as an exposition of the generative power of the UTT <–, 3, 4>, which was introduced towards the end of the first section. The analysis below the score shows that essentially all the chords of the passage are produced by the repeated application of this UTT. In effect, the reiteration is now asserting <–, 3, 4>, instead of <+, 7, 7>, as the characteristic gesture of the piece (even though the latter UTT links every alternate chord throughout the passage).

There are only two anomalies, indicated by broken-lined boxes in the example. Before the opening E minor triad proceeds by <–, 3, 4> to A♭ major, there appear C minor and C major triads. Example 10 shows how this succession can be analyzed transformationally using operations in the K(1,1) group that were exposed in the first section. E minor proceeds to C minor by the same transposition, <+, 8, 8>, that changed B♭ minor to F♯ minor near the beginning of the first section. The following alternation of C minor and C major involves the UTT <–, 0, 1> (and its inverse, <–, 11, 0>) that changed B major to B minor at the end of the first section. We also hear the UTT <–, 7, 8>, which implicitly connects E minor to C major, as a preparation for subsequent events (and also its inverse, <–, 4, 5>).

After E minor returns, as shown in Example 9, the reiteration of <–, 3, 4> generates successive chords in the section up through B♭ minor, and from F minor to the end of the passage. The <–, 3, 4> chain is broken by F♯ minor, which follows B♭ minor (by <+, 8, 8>), and which is highlighted by the second broken-lined box on the example. That chord also initiates a nearly exact repetition of the chord-series that appeared in the first section of the quartet, as shown by the brackets below Examples 8 and 9. I did not hear the first section as generated by <–, 3, 4>, but its repetition in this context suggests that a <–, 3, 4> chain underlies it. This possibility is strengthened by the one difference between the two passages, which is circled on both examples: the substitution of A major for C♯ minor. As shown in Example 11a, A major relates by <–, 3, 4> to the preceding F minor and succeeding C minor, and it relates to the original C♯ minor by the same K(1,1) UTT, <–, 7, 8>, that transformed E minor to C major at the beginning of this section.

This interpretation suggests a way of understanding the F♯ minor chord that interrupts the otherwise unbroken <–, 3, 4> chain. Example 11b gives a transformational network with the same graph as Example 11a, but with different triads as the contents of the nodes. It asserts that F♯ minor can be heard, via a K(1,1) transformation, to stand for a D major triad that would continue the <–, 3, 4> chain, exactly analogous to the relation of C♯ minor and A major in Example 11a.

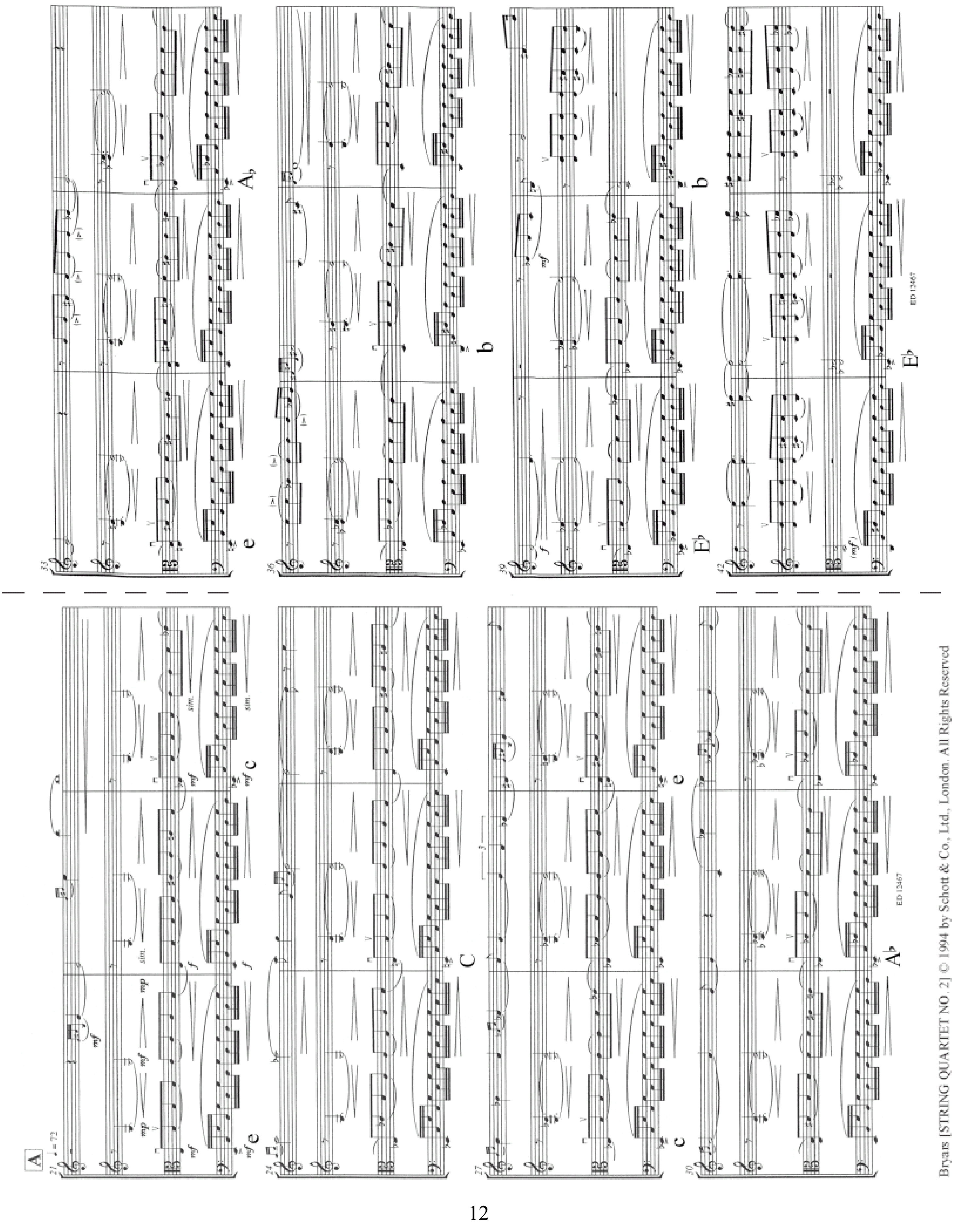
Considering this substitution, then, it is possible to hear the reiteration of the UTT <–, 3, 4> throughout Example 9, strongly confirming our reading of its presence during the first section. The series exposes 20 out of the 24 possible triads in the complete cycle. It suggests comparison with a 19-chord cycle, involving the UTT <–, 9, 8>, in the Scherzo of Beethoven's Ninth Symphony (first cited by Richard Cohn, and also referenced in Hook's article).[13] Although <–, 3, 4> does not produce familiar tonal successions, it is a cognate of the Scherzo's mediant transformation, <–, 9, 8>, in two senses: it changes mode while alternating root transpositions of minor and major thirds; and its square is transposition by interval class 5.[14]

Finally, let us consider the fourth section of the Second Quartet. The score is shown in Example 12 and my analysis in Example 13. This section, too, nearly replicates the chord progression from the first section. The difference is the second chord, which is D major rather than F♯ minor. This is precisely the substitution we intuited for the F♯ minor during rehearsal B, as analyzed in Example 11b. The remainder of the fourth section repeats the corresponding chords of the first section. But keeping in mind the substitutions just confirmed, we can now hear F♯ minor and C♯ minor as substituting for D major and A major, respectively. Accordingly we can now understand the passage as generated entirely by a repeated <–, 3, 4>, the same UTT that generated the chord succession in mm. 21-76.

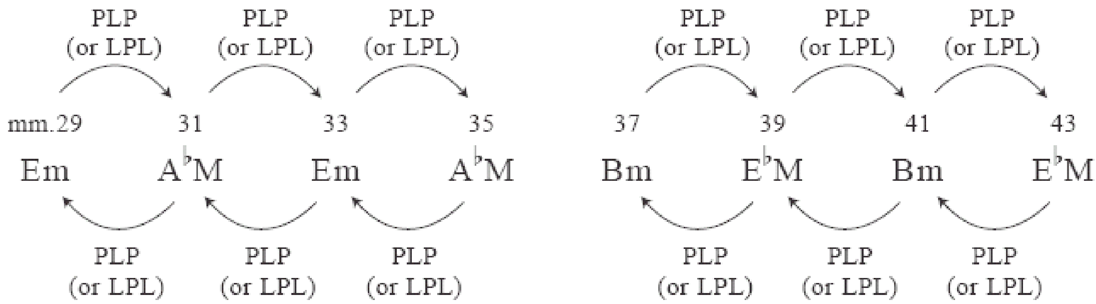
[13] Cohn, "Neo-Riemannian Operations," 36. Hook, "Uniform Triadic Transformations," 90.
[14] A third sense, its suitability for parsimonious voice-leading, is discussed in John Roeder and Scott Cook, "Triadic Transformation and Parsimonious Voice Leading in Some Interesting Passages by Gavin Bryars," *Intégral* 20 (2006), forthcoming.

This analysis demonstrates that Bryars's harmonies are not to be dismissed simply as "non-functional" sonorities. Supported by Hook's theory, it shows that their "blissfulness" can instead be conceived as the result of a coherent, simply transitive transformational system. One particular transformation is established as a characteristic gesture and all chord changes in the music result from the action of the operations in this system.

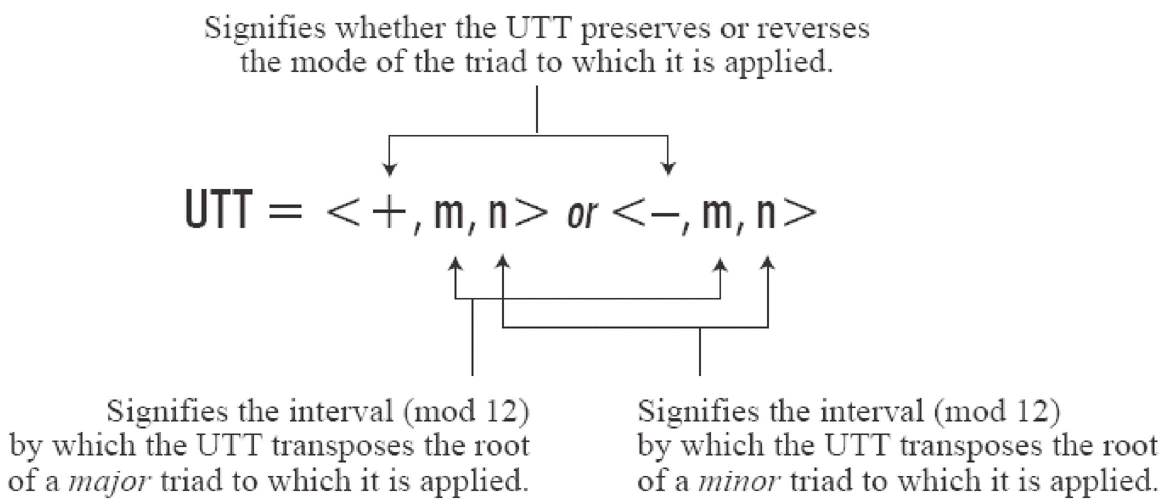
Example 1: Gavin Bryars, Second String Quartet, mm.21-44.



Example 2: A neo-Riemannian analysis of mm. 29-44 from Bryars's Second String Quartet



Example 3: Julian Hook's theory of UTTs



Example 4: Some examples of UTTs

<–, 3, 4> transforms E♭M to G♭m and G♭m to B♭M

<+, 1, 6> transforms BM to CM and Cm to F♯m

<–, 4, 3> transforms AM to C♯m and C♯m to EM

<+, 7, 7> transforms CM to GM and Cm to Gm

Example 5: The simply transitive (sub)groups K(a,b), where a2 = 1 and ab = b, resulting in <+, n, an> and <-, n, an + b>, as n ranges from 0 to E, and a and b are integers mod 12

(a = 1) · K(1,0), K(1,1), K(1,2), …, K(1,E)
(a = 5) · K(5,0), K(5,3), K(5,6), K(5,9)
(a = 7) · K(7,0), K(7,2), K(7,4), K(7,6), K(7,8), K(7,T)
(a = E) · K(E,0), K(E,6)

K(1,1), *a* = 1 and *b* = 1. For each n = 0, 1, 2,…E, the mode-preserving member of the group is <+, *n, an*> = <+, *n, n*>, and the mode-reversing member of the group is <–, *n, an* + *b*> = <–, *n, n* + 1>.

The resulting twenty-four members of the K(1,1) simply transitive subgroup are:

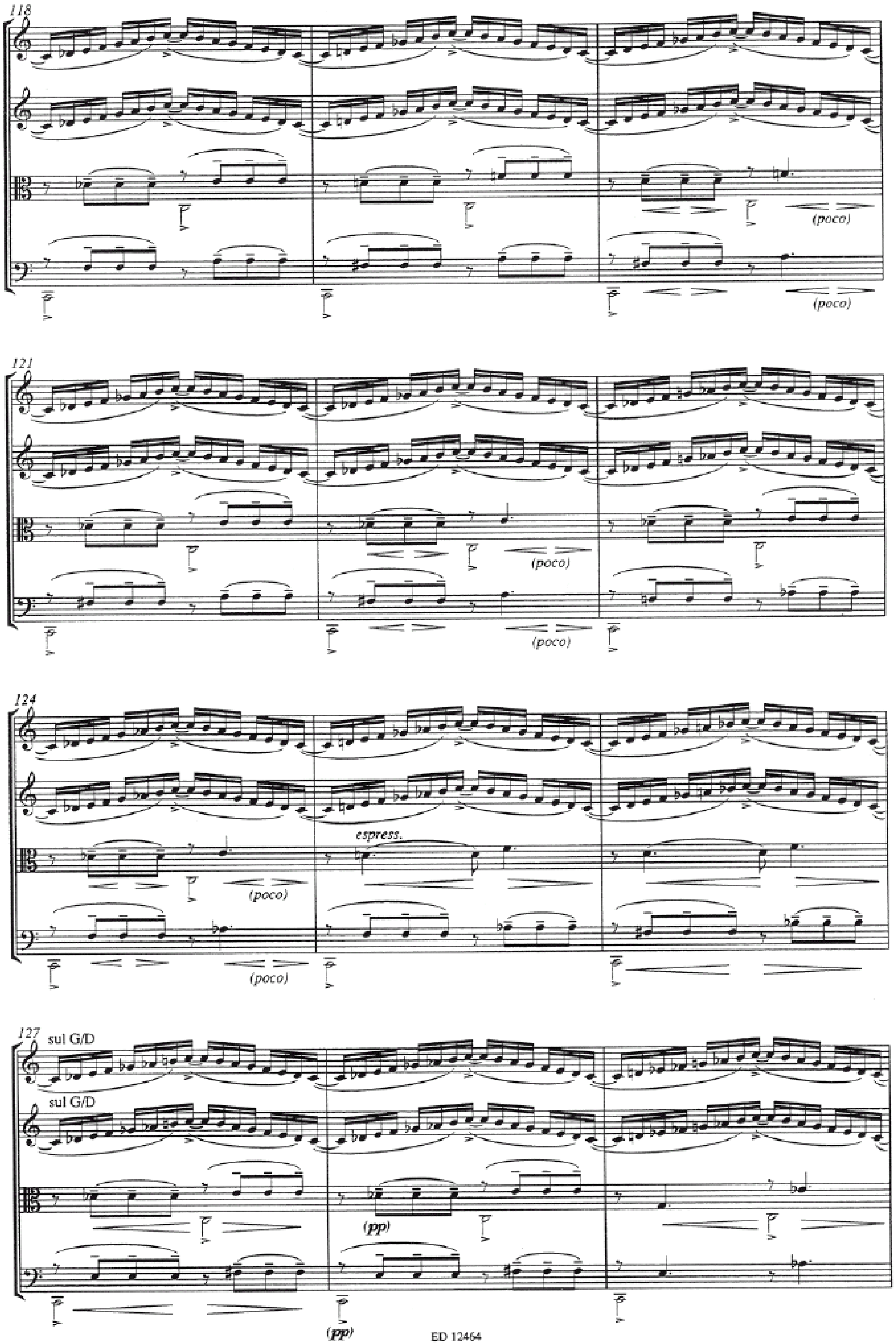
Mode Preserving:

<+, 0, 0>	<+, 3, 3>	<+, 6, 6>	<+, 9, 9>
<+, 1, 1>	<+, 4, 4>	<+, 7, 7>	<+, T, T>
<+, 2, 2>	<+, 5, 5>	<+, 8, 8>	<+, E, E>

Mode Reversing:

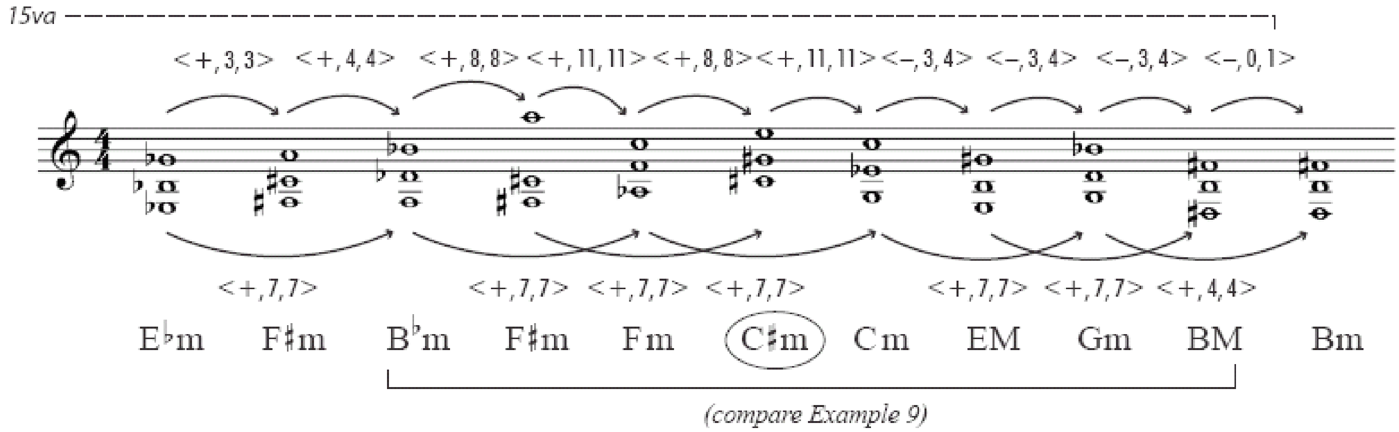
<–, 0, 1>	<–, 3, 4>	<–, 6, 7>	<–, 9, T>
<–, 1, 2>	<–, 4, 5>	<–, 7, 8>	<–, T, E>
<–, 2, 3>	<–, 5, 6>	<–, 8, 9>	<–, E, 0>

Example 6: Gavin Bryars, First String Quartet, mm. 118-129.

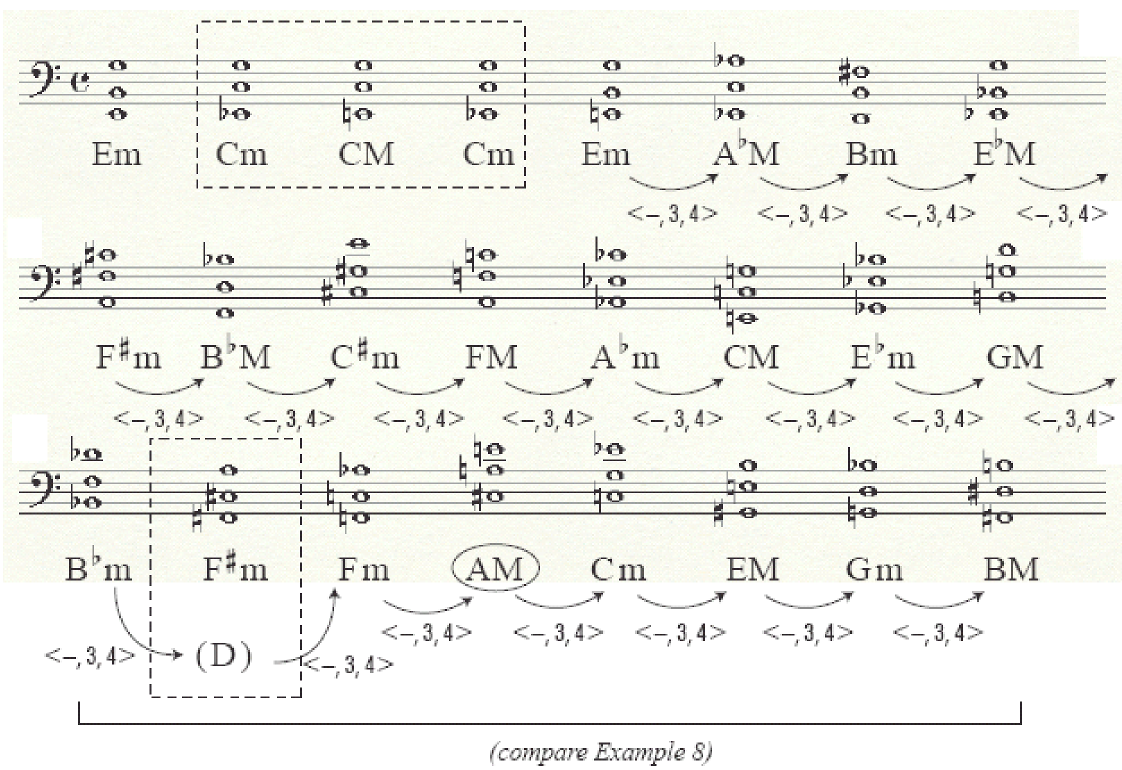


Example 7: The first section (mm. 1-20) of Bryars's Second String Quartet.

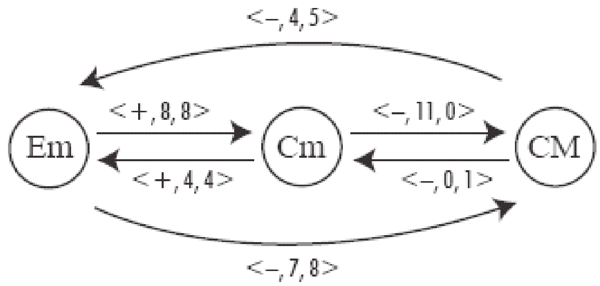
Example 8: Analysis of Bryars's String Quartet 2, mm.1-20, using UTTs from K(1, 1)



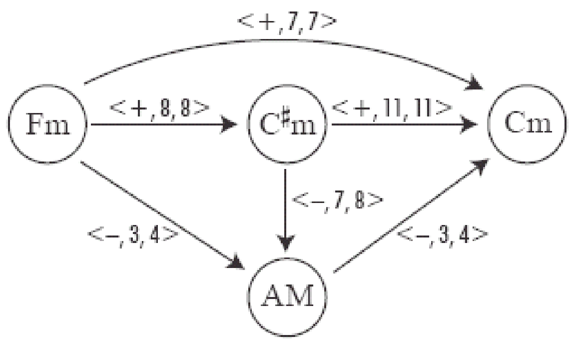
Example 9: Analysis of mm. 21-76 of Bryars's Second String Quartet



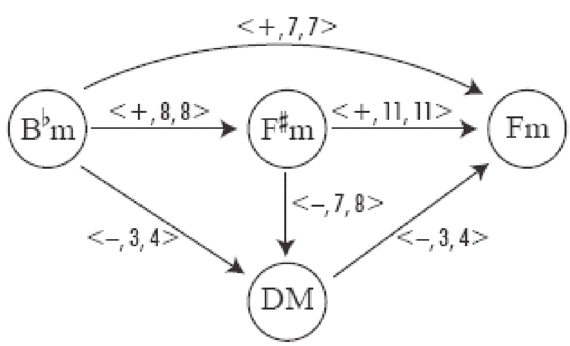
Example 10: Transformational analysis, using K(1,1) operations, of the opening of Reh. A



Example 11a: The substitution of A major for C# minor during Reh. B restarts the <-, 3, 4> chain

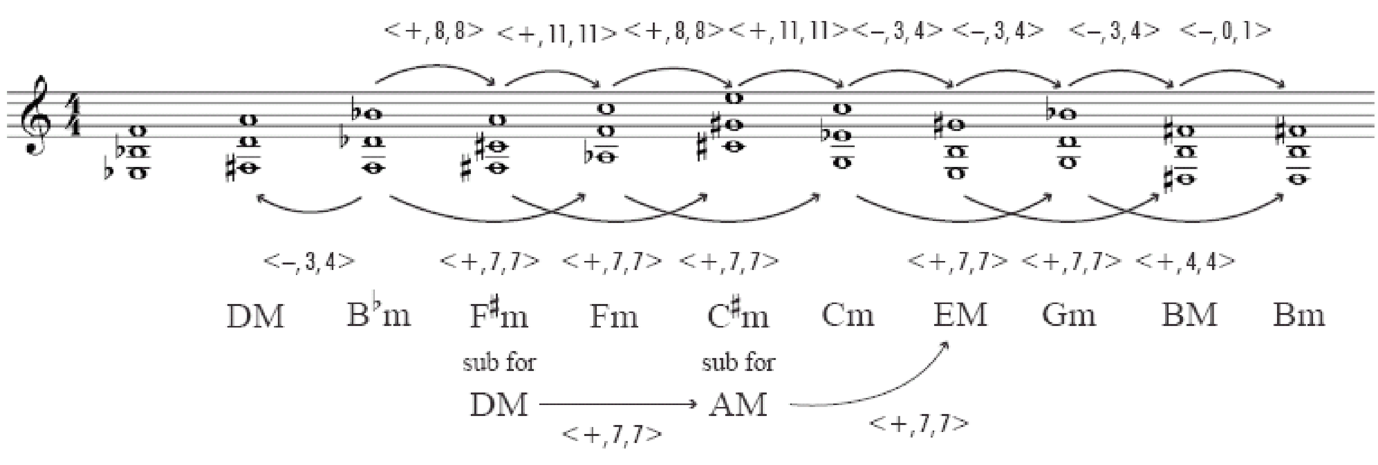


Example 11b: The F# minor stands for D major in the <-, 3, 4> chain



Example 12: The substitution of A major for C# minor during Reh. B restarts the <-, 3, 4> chain

Example 13: Analysis of the fourth section using UTTs from K(1,1)



<–, 3, 4> path created by chord substitutions in fourth section:

B♭m DM Fm AM Cm EM Gm BM

(compare examples 8 & 9)

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