Multi-Linear Continuity, Musical Perception, and Renaissance Poly-Modality

by Michael Lively
Southern Methodist University
michaelluvely@prodigy.net
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Music theorists of the fifteenth and sixteenth centuries often described polyphonic compositions as entities that were capable of comprising material derived from more than one diatonic mode. This *poly-modal* quality of Renaissance music might be achieved in at least two different ways: (1) the individual voice parts of a polyphonic work could be analyzed in different modes, or (2) the pitch material of a single voice part could be understood as representing a mixed collection of modal elements. In relation to the analysis of both polyphonic and monophonic music from the Renaissance, I use the term *poly-modal*[1] to describe a musical work in which significant elements of more than one diatonic mode coexist and are expressed in either a contrapuntal or formal relationship to each other.[2]

The structural and temporal implications of Renaissance *poly-modality* can be explored from a number of theoretical perspectives, including David Lewin's formal model for musical perception, as described in his 1986 article "Music Theory, Phenomenology, and Modes of Perception."[3] Since the *poly-modal* elements of any musical work may suggest a plurality of voice-leading structures, the identification of *poly-modality* in a composition may also imply a compound understanding of musical continuity. An investigation of Renaissance *poly-modality* relates to the general discussion of perceptual and subjective temporality in music by considering the importance of "non-linear" and "multi-linear" musical continuity in *poly-modal* music from the Renaissance.

Renaissance Poly-Modality

Johannes Tinctoris maintained that the overall mode of a polyphonic composition was determined by the mode of the tenor voice, but that the mode of the other individual voice parts could be analyzed separately.[4] In *De natura et proprietate tonorum* he describes the tenor of

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[1] The term *polymodality*, without the hyphen, has been used to reference the combination of two or more modes that share a common tonic pitch. This sense of the word usually describes a technique encountered in modernist works from the twentieth century, especially the music of Béla Bartók.

[2] Carl Dahlhaus (1990, 201) has suggested that certain Renaissance-period theorists (such as Johannes Tinctoris and Pietro Aaron) are responsible for transmitting the "tenor theory" of modality—"the rule that the tenor represents the mode of a polyphonic composition"—while other theorists (such as Martin Agricola and Gallus Dressler) are responsible for the "ambitus schema"—"the norm that the authentic octave in the tenor and soprano should be matched by the plagal octave in the alto and bass, the plagal octave in the tenor and soprano by the authentic octave in alto and bass." Gioseffo Zarlino is placed in both categories of theorists and Dahlhaus asserts that the work of Cyriacus Schneegaß "unites both principles." All of the theoretical works cited above imply that the modality of individual voice parts may differ from the primary or "collective" modality of the musical work as a whole.

[3] Lewin's article was originally published in the journal *Music Perception* in 1986. I will subsequently be citing the 2006 reprint of the article in *Studies in Music with Text.*

[4] "Whenever any mass or cantilena or any other kind of composition will have been put together from different parts of different tones, if anyone when asked may wish to seek absolutely of what tone such a composition may be, he

Guillaume Dufay's *Le serviteur*[5] as being in the Dorian mode, while the superius and contratenor are both in the Hypodorian mode.[6] Tinctoris, as well as Gioseffo Zarlino, recommended that adjacent voice parts, such as the tenor and the bass, should be composed in contrasting authentic or plagal forms of the modes that share a common final.[7] If the tenor were composed in the Dorian mode, for example, the bass should be written in the Hypodorian mode. This helps to insure that the spacing between adjacent voices does not become too large in terms of intervallic distance.[8] Heinrich Glarean provided a number of examples in which the individual voice parts of polyphonic compositions could be analyzed in different modes, including examples in which the contrasting modes were not exclusively authentic and plagal pairs connected to a shared final pitch. Glarean described, for example, the tenor of the *Agnus dei* from the *Missa fortuna* by Josquin des Prez as being in the Lydian mode, while the bass of the same work was analyzed in the Ionian mode.[9]

The possibility of mixing elements of contrasting modes within the pitch content of a single voice part was a topic that Tinctoris described in great detail. He distinguished between material that consisted of "mingled" modal elements, in which both the authentic and plagal versions of the modes with a common final were present, and material that consisted of "mixed" modal elements, in which material with characteristics of more than one mode were present, other than the associated plagal or authentic version of the original mode.[10] Tinctoris describes the antiphon *Nos qui vivimus* (Example 1a)[11] as a mixture of the Hypomixolydian and Hypolydian modes.[12] Although the melodic content and range of the antiphon may be derived from the Hypolydian mode, the final pitch is G, which is consistent with the Hypomixolydian mode. Tinctoris considers the possibility that the antiphon could also be described as being in a transposed or "irregular" form of the Hypodorian mode (Example 1b),[13] but he maintains that "whenever a tone can be proven regular, it ought not to be judged irregular."[14]

In some cases the reasons that Tinctoris chose to analyze a particular melodic segment as comprised of mixed modal elements may not be immediately evident to the twenty-first-century

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should absolutely reply according to the quality of the tenor, for the reason that it is the principal part of every composition as the foundation of the whole relationship. And if it is specifically sought concerning any other part of this kind of composition as to of what tone it is, he will reply specifically this or that." Tinctoris (1967 [1476], 24-25).

[5] Dufay's *Le serviteur* may be found in the *opera dubia* section of the collected works edition produced by Heinrich Besseler. It is decribed as a "significant work, but certainly unauthentic." Dufay (1964, vol. 6, xiv).

[6] Tinctoris (1967 [1476], 25).

[7] Leo Treitler (1965) has suggested that Dufay was able to achieve a kind of "tonality" by precisely combining the species of fifths and the species of fourths that were used in a polyphonic work.

[8] "But truly since the mode in which a composition is set is established in the tenor, the parts should be arranged in such a manner that if the mode in this part occupies the notes of the authentic, as I have said, the bass will contain in its notes the collateral, or plagal, mode. And so vice versa: if the tenor occupies in its notes the plagal mode, the bass ought to contain the authentic: and when they are so arranged, the others will then be accompanied in the best way without any inconvenience to the composition." Zarlino (1558, 338), translated by Vered Cohen (1977, 204).

[9] Glarean (1965 [1547], 250).

[10] Tinctoris (1967 [1476], 25). The term used by Tinctoris for the "mingling" of modes is *mixtio* and the term for the "mixture" of modes is *commixtio*. The Latin text of *De natura et proprietate tonorum* may be found in Albert Seay's edition of the theoretical works of Johannes Tinctoris (1975).

[11] Example 1a is taken from Example 29 in Tinctoris (1967 [1476]).

[12] Tinctoris (1967 [1476], 18).

[13] Example 1b is taken from Example 30 in Tinctoris (1967 [1476]).

[14] Tinctoris (1967 [1476], 18).

reader. Tinctoris analyzes Example 2,[15] for instance, as a mixture of the Dorian and Mixolydian modes, rather than as simply representing the Dorian mode alone.[16] The apparent discrepancy between the modern reader's understanding of Renaissance modality and the actual modal identifications offered by Tinctoris may in some cases derive from the modern tendency to consider the modes as collections of octave species rather than as compound assimilations of species of fifths (the *diapente*) and species of fouths (the *diatesseron*). Tinctoris described the "mixed modes" as the result of a tone "that has not been formed from its beginning up to its end from the types of diapente and diatessaron attributed to itself..., [but] on the contrary..., has been mixed with types of another one or many."[17]

During the fifteenth and sixteenth centuries, the identification of mode was not simply a method of labeling diatonic pitch content, but rather an analysis of many important and distinct aspects of a musical work's structural form and substance, including elements that we might in the twenty-first century describe as the voice-leading structure of a composition. It is therefore highly significant that the mixed modal elements, or *poly-modality*, of Renaissance polyphony suggest multiple musical perceptions of continuity that the listener, or the theorist, may interpret subjectively. These multiple and contrasting strands of subjective musical perceptions are inherently connected to the listener's ability to create and maintain a conceptual design of temporality that may include non-linear or multi-linear continuities.

Musical Perception

David Lewin (2006) proposed the following model for musical perception:[18]

$$p = (EV,CXT,P\text{-}R\text{-}LIST,ST\text{-}LIST)$$

In this formula, p is defined as a formal list containing four elements. EV specifies a sonic event or family of events being perceived. CXT specifies a musical context in which the perception occurs. P-R-LIST is a list of pairs (p,r), each pair specifying a perception (p) and a relation (r). ST-LIST is a list of statements (s) made in some language (L). Lewin demonstrates the possibility that musical perceptions may function as the objects of other musical perceptions through an example similar to the one found in Example 3. According to Lewin, Perception(a) represents a "hugely complex network of things, things including other perceptions, their relations among themselves, and their relation to Perception(a) itself."[19] Perception(b), as Lewin describes the diagram, is an object of Perception(a); however, Perception(a) is also an object of Perception(b).

At the instant of cursor-time *x*, Perception(b) has not occurred, but it exists as an object of Perception(a). At cursor-time *y*, Perception(a) represents an object of *retention*[20] in relation to Perception(b). Both of these musical perceptions, Perception(a) and Perception(b), are objects of

[15] Example 2 is taken from Example 24 in Tinctoris (1967 [1476]).
[16] Tinctoris (1967 [1476], 15-16).
[17] Tinctoris (1967 [1476], 15).
[18] Brian Kane (2011) has explored the intellectual sources for Lewin's model of musical perception, which is described as the "p-model." In Kane's study, Lewin's overt references to Edmund Husserl's theories of phenomenology are connected to the work of Maurice Merleau-Ponty, Martin Heidegger, and Gottlob Frege.
[19] Lewin (2006, 57).
[20] Lewin references Husserl's idea of *retention*, the projection of conceptually past or previous elements into the present consciousness.

Perception(c), as are all of the complex relationships between Perception(a) and Perception(b).

Lewin provided an application of the model to Perception(c) from Example 3.[21] In this situation, EV would be the last beat of Perception(c). CXT would be the complete text of Perception(c). The P-R-LIST would include elements such as (Perception(b), denial). The ST-LIST would include, in some language (L), statements such as "deceptive cadence." Lewin's application of the model to Perception(c) from Example 3 may be shown in the form of a diagram (Table 1). In this application of the model a single musical perception is described in terms of the formal list.

Table 2 provides an application of Lewin's model to the musical perceptions implied by Tinctoris in his description of the antiphon *Nos qui vivimus*, as shown in Example 1. In this application of the model three musical perceptions are described in terms of the formal list. As shown in Table 2, p_1 describes a perception of the antiphon in the Hypomixolydian mode, p_2 describes a perception of the antiphon in the Hypolydian mode, and p_3 describes a perception of the antiphon as a transposed or "irregular" form of the Hypodorian mode.

In Perception(p_1) the EV is the final pitch, since recognition of the pitch G as the modal final is the primary reason for identifying the mode as Hypomixolydian. In Perception(p_2) the EV is the pitch B-flat, because that pitch, considered together with the range of this antiphon, tends to suggest the Hypolydian mode. In Perception(p_3) the EV is the entire antiphon; however, the CXT includes both Example 1a and Example 1b, which represents the melodic content of the antiphon transposed to the level of the Hypodorian mode. The CXT of Perception(p_3) includes an imaginary text outside of the content of the antiphon itself.

Depending upon which musical event (EV) the listener chooses to "hear," and in which context (CXT), the modality as well as other perceptual aspects of the antiphon, may vary. The nature of modality in this work is therefore not a permanent or immutable quality of the text itself, but rather a subjective construction that is selected and perceived by the listener. Since it is possible to perceive more than one possible mode in this antiphon, the quality of the work's modality may be said to be perceptually subjective.

Heinrich Glarean provides a *poly-modal* analysis of Josquin's *De profundis* in which the work is understood to begin in the Dorian mode and end in the Phrygian mode.[22] This analysis seems to reflect a considerable element of subjective musical perception, since both the chant melody and Josquin's polyphonic composition would normally be considered to represent the Hypophrygian mode, or a combination of the Hypophrygian and Phrygian modes.[23] Glaraean's analysis is probably derived primarily from the range of the tenor voice, but also from the idea of *phrasis*, or characteristic movement patterns that may be identified in various voice parts. Glarean used the term *phrasis* to describe the tendency of each mode to emphasize certain motivic tone successions that were derived from plainsong. An important aspect of the concept of *phrasis* for Glarean is the characteristic leap associated with each mode, as shown in Example 4.[24]

[21] Lewin (2006, 60).

[22] Glarean (1965 [1547], 266-67). Hugo Riemann (1962 [1920], 310) describes this section of the *Dodecachordon* as among the most curious and difficult to interpret.

[23] Josquin's *De profundis* is described as being in the Hypophrygian mode by Zarlino (1558, 324); Cohen (1977, 145).

[24] Example 4 is taken from Glarean (1965 [1547], 71).

Subjective elements of modal identification, such as the concept of *phrasis*, the analysis of modal species of *diapente* and *diatesseron*, or the assignment of hexachordal placement, could all contribute to the flexible and *poly-modal* understanding of Renaissance polyphony. If different voice parts could be understood to simultaneously express different diatonic modes, and if individual voices could represent "mixed" combinations of modes, then the listener was required to essentially choose the mode or modes from which any of a musical work's many subjective continuities might be derived. The inherent complexity and subtlety of the Renaissance system of modality, especially in the context of polyphonic and *poly-modal* compositions, results in a fundamentally subjective process of perception that is required in order to form an analysis of the modal characteristics of any musical composition.

Table 3 provides an analysis of selected elements from Josquin's *De profundis* that tend to suggest aspects of modal identification. In this application of the model five musical perceptions are described in terms of the formal list. Example 5 provides the first thirteen measures (in modern notation) of Josquin's *De profundis* as a reference. In Perception(p_1) the EV is the range of the soprano and tenor lines, which is consistent with the Hypodorian mode. In Perception(p_2) the EV is the range of the alto and bass lines, which is consistent with the Dorian mode. In Perception(p_3) the EV is the characteristic leap from A to D, which occurs in the alto line in m. 4 and the bass line in m. 12, and is consistent with the Dorian mode.[25] In Perception(p_4) the EV is the characteristic leap from E to A, which occurs in the soprano line in m. 4 and the tenor line in m. 12, and is consistent with the Hypophrygian mode. In Perception(p_5) the EV is the characteristic leap from E to C, which occurs in the soprano line in m. 2 and the tenor line in m. 10, and is consistent with the Phrygian mode.

From a non-linear point of view, all of the musical perceptions in Table 3 may be understood to exist simultaneously. Since each of these perceptions is derived from its own musical event (EV), they are each unique in terms of syntactic or functional meaning, yet they share the larger source-context of the work as a whole, and therefore, at least in a non-linear sense, equally exist as possible perceptions within the listener's understanding of the work. Although some of the perceptions seem to logically eliminate the validity of other perceptions, they exist together as non-linear continuities.

From a multi-linear point of view, the musical perceptions in Table 3 represent a list of possible events from which the listener may subjectively reconstruct a number of potential musical continuities. The recognition or understanding of these potential linear continuities is a subjective process that is determined by which perceptions the listener chooses to include within any particular reconstruction of the work. Just as some perceptions seem to eliminate the possibility of other perceptions, some of the possible linear reconstructions of continuity seem to eliminate other possible continuities.

Multi-Linear Continuity

I use the term *non-linear* to describe the consideration of a musical work independent of any aspect of linear continuity,[26] that is, the musical work as a whole, as if all of the inherently

[25] All of the melodic leaps that I identify in this segment of Josquin's *De profundis* are inversions of the intervals identified by Glarean as "characteristic leaps;" however, the assumption is made that inversions of the "characteristic leaps" still convey a significant element of modal identity.

[26] *Linear continuity* refers to the understanding of a musical work as a one-dimensional series of elements in temporal sequence.

successive or contrapuntal elements of the work were to take place at the same time. The term *multi-linear* refers to the listener's subjective process for the re-construction of linear continuities from a musical text that is fragmented or discontinuous in terms of immediately perceptible linear continuity. Since the re-structuring of linear continuity from constituent and often ambiguous elements of musical structure is a creative process, there are usually a plurality of possible linear continuities that may be re-formulated by the listener, hence the term *multi-linear continuity*.[27]

Example 6 provides a multi-linear voice leading analysis of *Nos qui vivimus* that attempts to convey the *poly-modal* qualities of the antiphon that were described by Tinctoris; in Example 6a the antiphon is analyzed in the Hypolydian mode, while in Example 6b the antiphon is analyzed as a transposed version of the Hypodorian mode. The final pitch of the antiphon may be understood to represent an element of functional, or subjective, ambiguity since it could be analyzed as either a modal final in a transposed version of the Hypodorian mode, or as a supertonic scale degree in the Hypolydian mode.[28] The subjective choice of the specific musical event (EV) and context (CXT) that is selected for the understanding of any specific musical perception (p) determines the function of the constituent elements within the theoretical range of that specific musical perception.

Example 7 provides a multi-linear voice leading analysis of the first seventeen measures (in modern notation) of Josquin's *De profundis*. The soprano line is analyzed in the Hypodorian mode, the alto line in the Dorian mode, the tenor line in the Hypophrygian mode, and the bass line in the Dorian mode. Example 8 provides the first seventeen measures (in modern notation) of Josquin's *De profundis* as a reference. Some of the possible linear continuities that may be derived from the list of perceptions provided in Table 3 are shown in Example 7. From a multi-linear point of view, in which the listener subjectively chooses which elements of the music to group together into a meaningful thread of continuity, the Dorian or Hypodorian modality might share the same level of validity as the Hypophrygian interpretation of this work, at least during the first seventeen measures. The analysis or identification of specific musical events (EV), and in which specific musical contexts (CXT) the listener chooses to select these events in order to construct one or more perceptions of continuity, is an inherently subjective process, especially in the case of complex *poly-modal* music from the Renaissance.

The process of creating voice-leading analyses of polyphonic music from the Renaissance is always a complex challenge and in many ways is an inherently subjective undertaking.[29] My approach, at least in relation to the analyses presented in this article, has been to assume that the essential voice leading for cadences, including important medial cadences, as well as characteristic motivic patterns found during opening gestures, caesuras, and the

[27] My use of the terms *non-linear* and *multi-linear* is largely derived from Kramer (1988).

[28] Carl Dahlhaus (1990 [1968], 196-210) has suggested that scale degree designations, similar to those commonly referenced in relation to tonal music from the common practice period, are not meaningful when discussing modal music from the Renaissance, because the relative diatonic relationships between the pitches are understood to be more structurally significant than the absolute relationship between any specific pitch and the modal final. Although I agree with this assessment of the fluidity of Renaissance modal perception, I have labeled the scale degrees implied by the *poly-modal* analyses in Example 7 and Example 9 because I believe that it efficiently conveys the sense of subjective muti-linear continuity that these examples are intended to express.

[29] David Stern (1990) provided an effective defense for the idea of applying Schenkerian analytical principles to the polyphonic music of the Renaissance. One of the earliest attempts to produce Schenkerian-style voice leading analyses of modal Renaissance polyphony may be found in a master's degree thesis from the University of North Texas (Knod, 1955). A review of Knod's thesis is presented in Lively (2007).

connections between phrases, should comprise the primary elements of the voice leading reductions provided for each individual voice part. For cadences and medial cadences, I attempt to include the voice leading patterns that Sarah Fuller (1992) describes as "directed progressions." I have attempted to find a balance in these analyses between the modal, or *poly-modal*, content of the individual voice parts and the overall harmonic motion that would be perceived by the modern listener.

Example 9 provides a multi-linear voice leading analysis of the first fifteen measures (in modern notation) of the Kyrie from Josquin's *Missa fortuna*. The soprano line is analyzed in the Hypolydian mode, the alto and tenor lines in the Lydian mode, and the bass line is analyzed as a transposed version of the Ionian mode, in B flat major.[30] Example 10 provides the first fifteen measures (in modern notation) of the Kyrie from Josquin's *Missa fortuna* as a reference. As implied by the analyses shown in Example 9, it is a subjective process that decides which perceptions will be connected into any particular strand of continuity and which perceptions will be eliminated or minimalized. Through re-assembling selected elements of continuity into individual, yet contrasting, functional progressions it is possible to compare, from a multi-linear perspective, some of the specific musical experiences that the work offers to the listener.

Conclusion

Since Renaissance music theorists described polyphonic works as capable of containing material that may be derived from more than one diatonic mode, it is possible to produce *poly-modal* analyses of these works. The identification of *poly-modal* structure seems in many cases to require an acceptance of multi-linear musical continuity, as a result of the overlapping or polyphonic nature of the specific musical perceptions that contribute to the sense of *poly-modality*. As Lewin described his model for musical perception, it "enables us to bypass certain false dichotomies in analytic discourse, dichotomies that arise when we implicitly but erroneously suppose that we are discussing *one* phenomenon... when in fact we are discussing *many* phenomena."[31] The consideration of polyphonic Renaissance compositions as multi-linear and *poly-modal* continuities provides the listener with the intellectual license to not immediately "collapse the reality" of the works' analytical possibilities, but rather to maintain the possibility of plural structures.

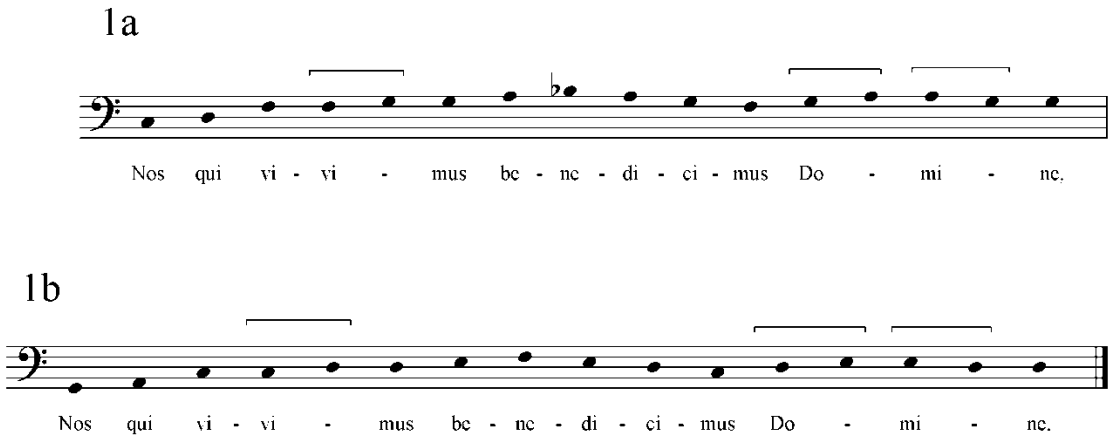
Since the concept of modality, or *poly-modality*, in relation to polyphonic compositions from the Renaissance was understood by contemporary theorists as dependent upon gesture-related idiomatic markers, such as Glarean's concept of "characteristic leaps," the perception of modality in these works was essentially re-assembled by the subjective listener, rather than simply being received in a one-dimensional temporal sequence. As a result, an almost entirely subjective process for perceiving this music could be established if these polyphonic and *poly-modal* works are not considered as singular self-revealing entities, but rather as groups of possible subjective continuities. The *poly-modal* nature of Renaissance polyphony may in some cases require the listener to actively and subjectively ascribe meaning to the musical text, not purely from literal perception, but also from internal and genre-based subjective formulations.

[30] As an item in support of the *poly-modal* analysis of this work, it may be observed that the pitch E flat, at least during this section of the *Kyrie*, is only found in the bass voice, thus contributing to the sense that the bass represents a different diatonic mode than the other three voice parts.

[31] Lewin (2006, 79).

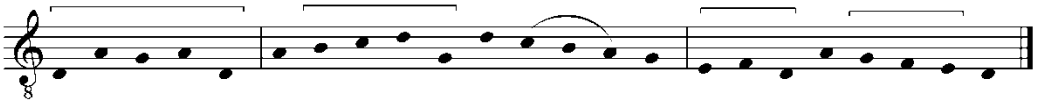
The main idea of this article has been to suggest that the inherently subjective process of resolving non-linear aspects of *poly-modal* structure into selected multi-linear strands of musical continuity is performed by the listener, or the theorist, more than it is received from the composer or from the music itself. Lewin described music analysis as a creative or even a poetic act. This "post-Bloomian" understanding of the value of music theory suggests that "the perception of a poetic work resides in the (active) making of another poetic work."[32] In the example of *poly-modal* polyphonic works from the Renaissance, the listener or theorist is given the opportunity to actively and subjectively create the musical experience that he or she chooses to perceive.

Example 1
Nos qui vivimus



[32] Lewin (2006, 103).

Example 2
Mixture of Dorian and Mixolydian Modes



Example 3

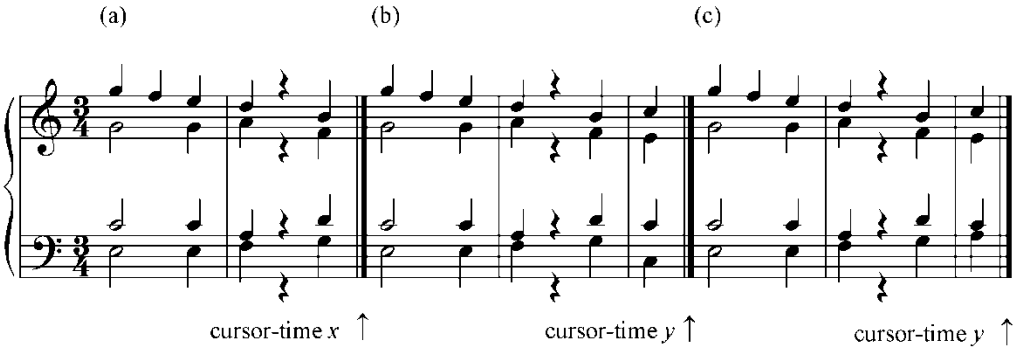


Table 1
A Musical Perception in Example 3

p	**EV**	**CXT**	**Selected P-R Pairs**	**Selected Statements**
p	last beat of Perception(c)	Perception(c)	(Perception(b), denial)	"deceptive cadence"

Table 2
Musical Perceptions in *Nos qui vivimus*

p	EV	CXT	Selected P-R Pairs	Selected Statements
p_1	final pitch, G	complete antiphon	(final pitch determines mode, confirmation)	Hypomixolydian mode
p_2	B-flat	complete antiphon	(range and pitch content determines mode, confirmation)	Hypolydian mode
p_3	complete antiphon	antiphon and antiphon transposed to Hypodorian mode	(range and octave species determines mode, confirmation)	Hypodorian mode

Example 4
Characteristic Leaps

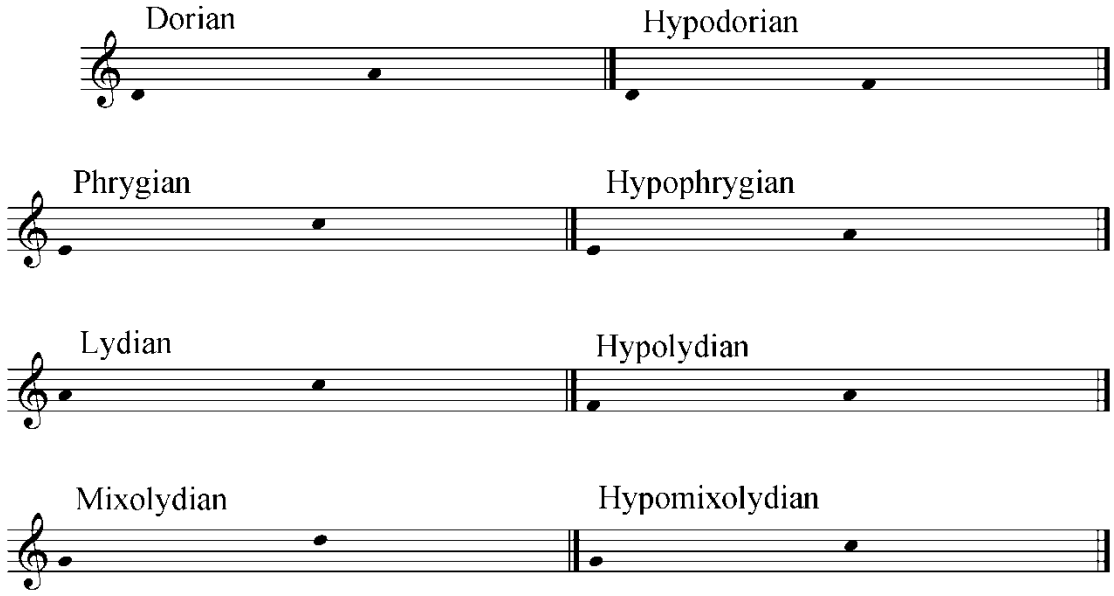
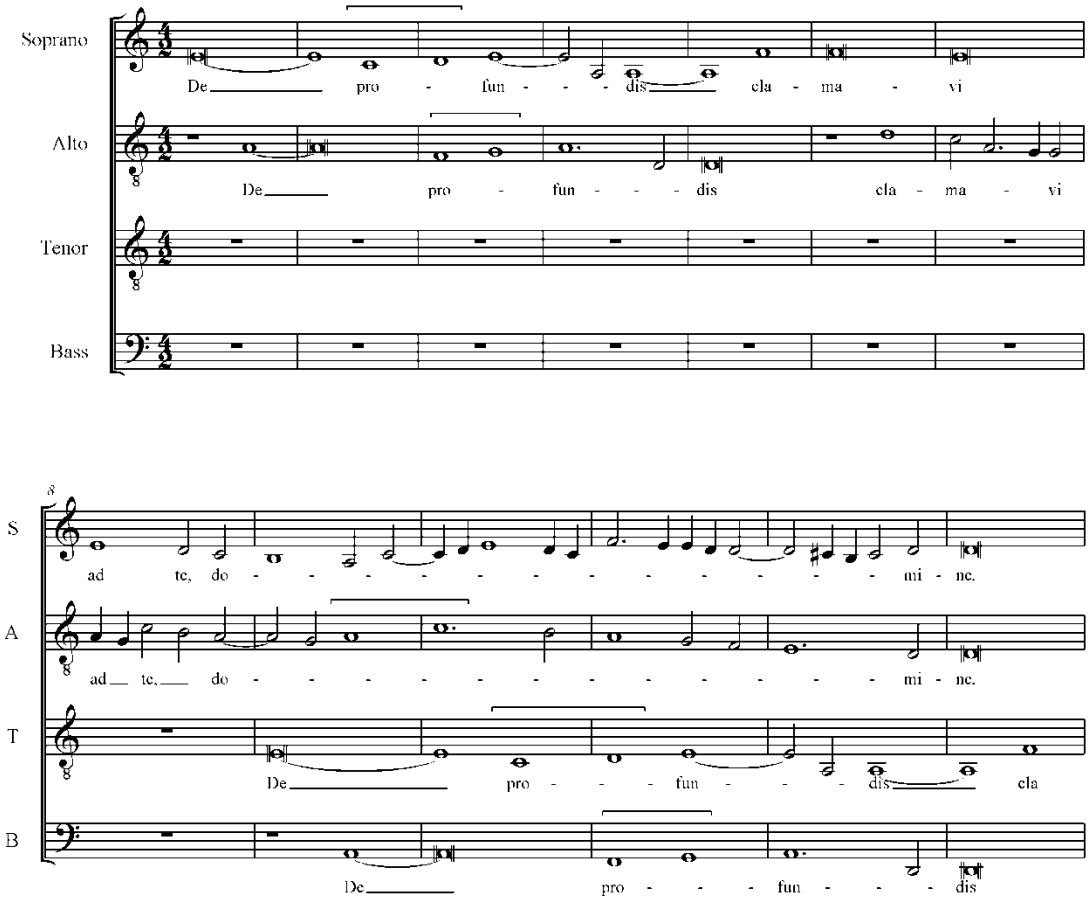


Table 3
Musical Perceptions in *De profundis*, mm. 1-13

p	**EV**	**CXT**	**Selected P-R Pairs**	**Selected Statements**
p_1	range of soprano and tenor lines	mm. 1-13	(range determines mode, confirmation)	Hypodorian mode
p_2	range of alto and bass lines	mm. 1-13	(range determines mode, confirmation)	Dorian mode
p_3	leap from A to D (alto, m. 4) (bass, m. 12)	mm. 1-13	(characteristic leap determines mode, confirmation)	Dorian mode
p_4	leap from E to A (soprano, m. 4) (tenor, m. 12)	mm. 1-13	(characteristic leap determines mode, confirmation)	Hypophrygian mode
p_5	leap from E to C (soprano, m. 2) (tenor, m. 10)	mm. 1-13	(characteristic leap determines mode, confirmation)	Phrygian mode

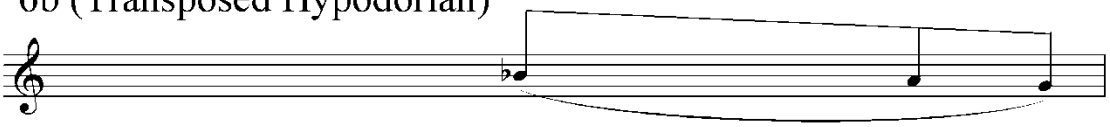
Example 5
De profundis, Mm. 1-13



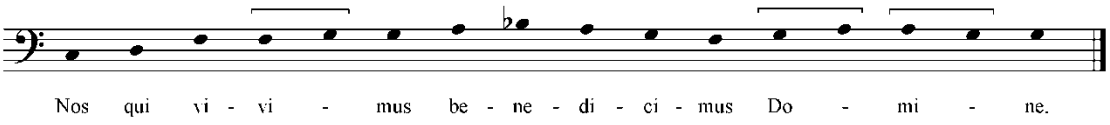
Example 6
Nos qui vivimus- Multi-Linear Voice Leading

6a (Hypolydian)

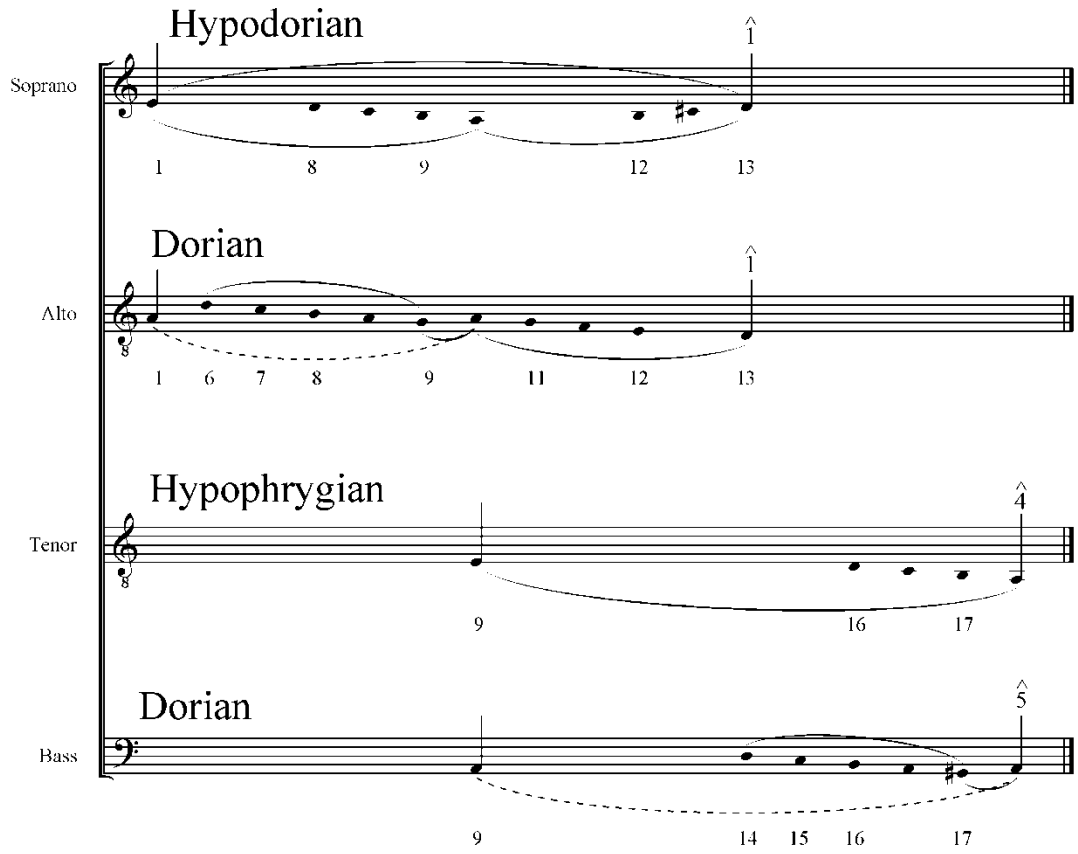
6b (Transposed Hypodorian)



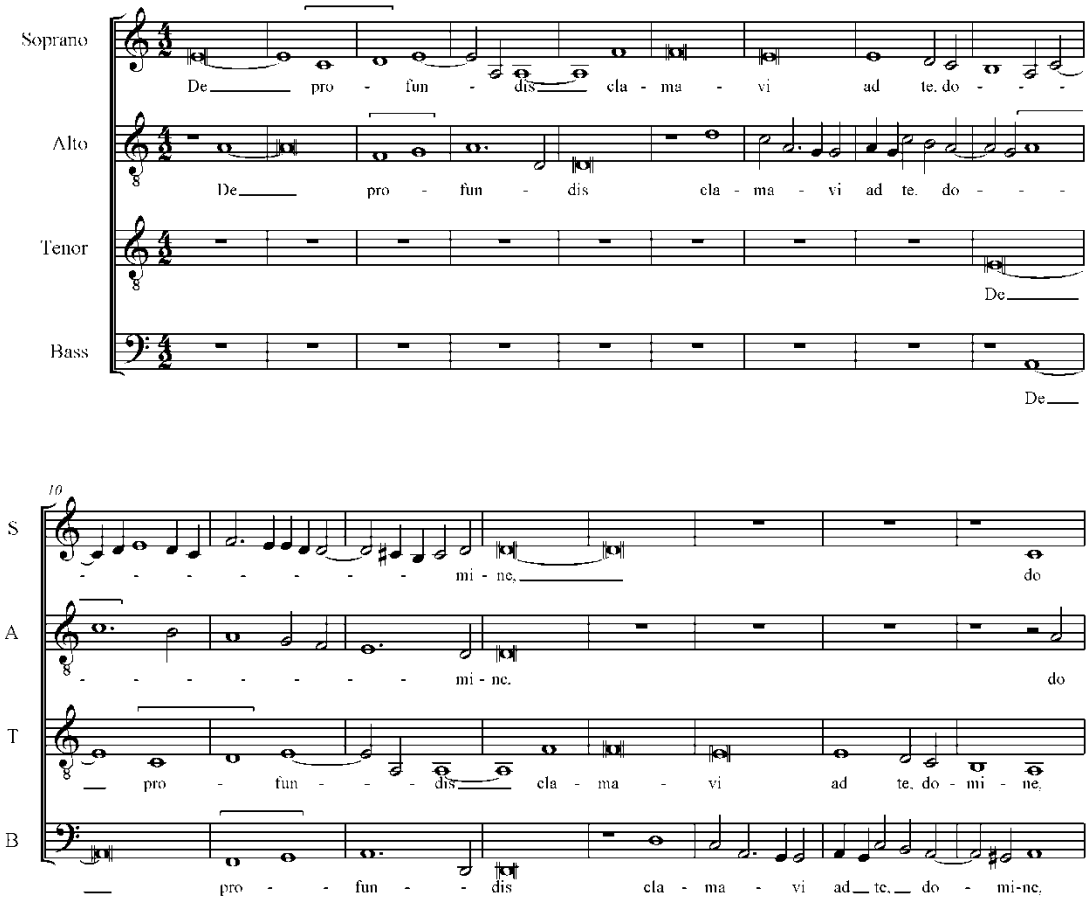
6c (Antiphon)



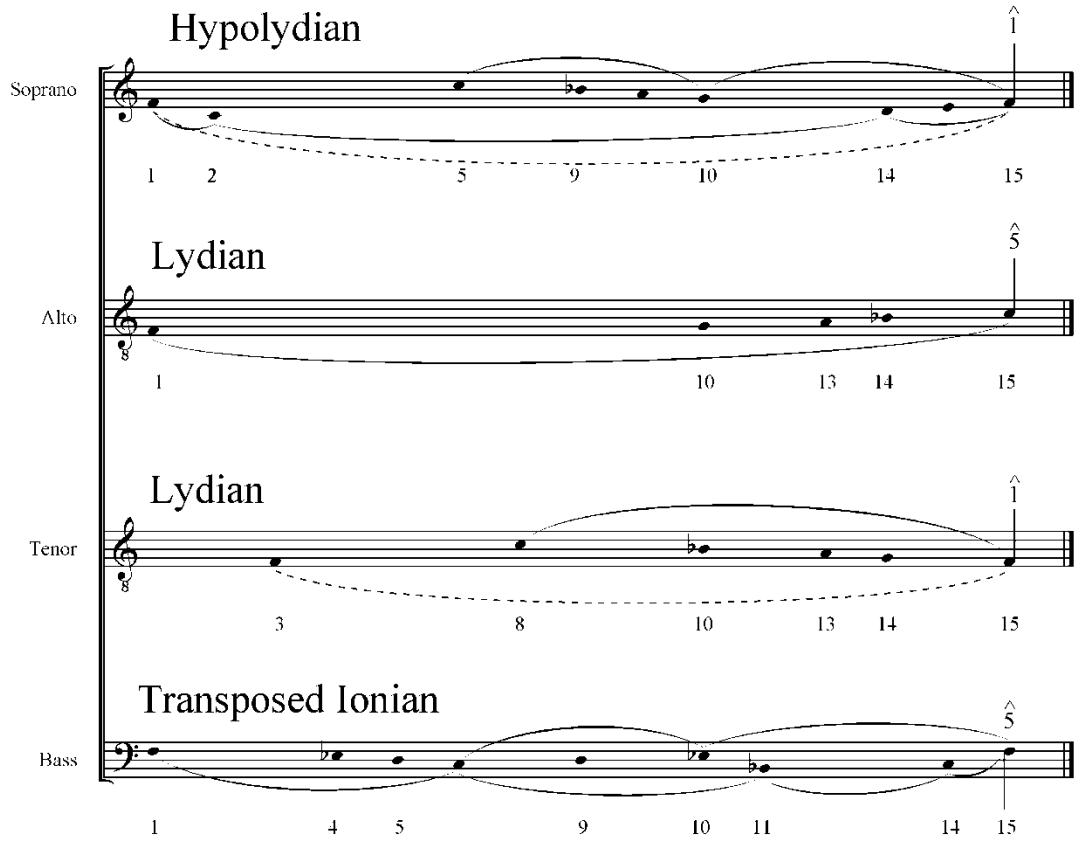
Example 7
De profundis- Mutli-Linear Voice Leading



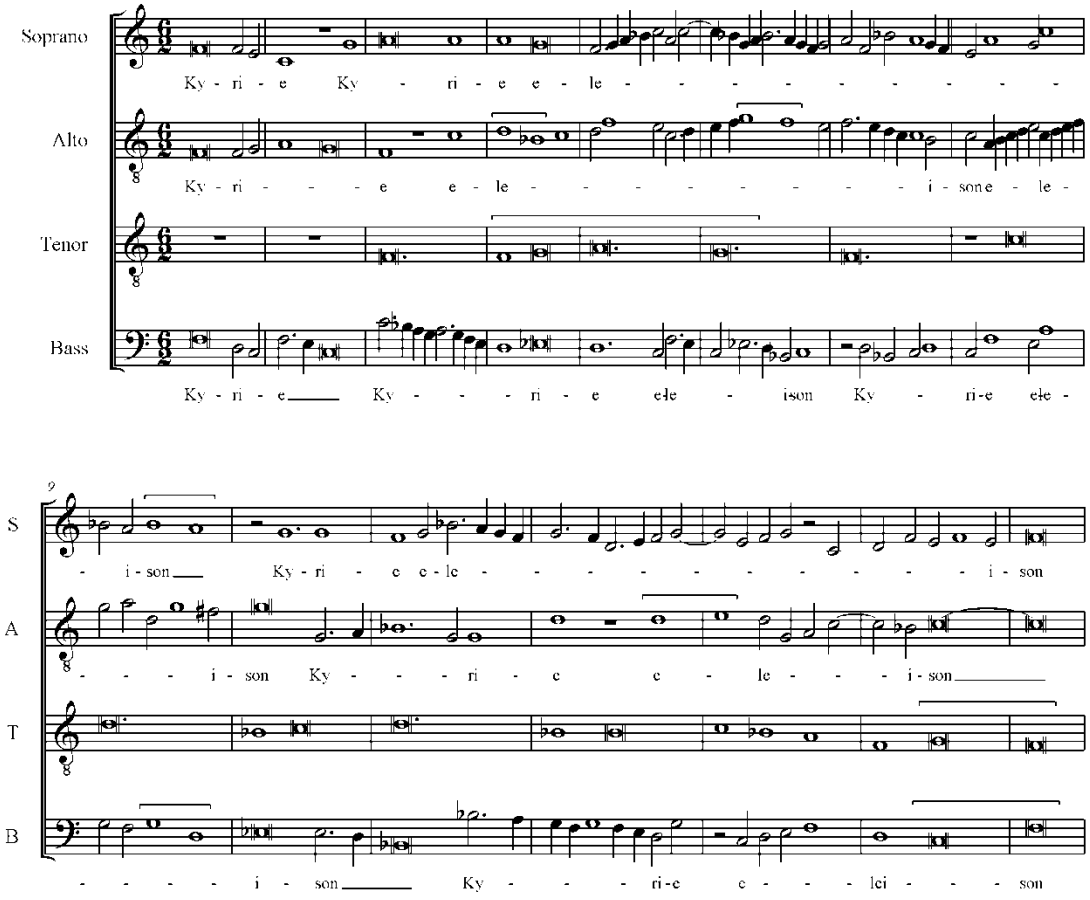
Example 8
De profundis, Mm. 1-17



Example 9
Missa fortuna- Mutli-Linear Voice Leading



Example 10
Kyrie- *Missa fortuna*, Mm. 1-15



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