REFERENTIAL SETS, REFERENTIAL TONICS, AND THE ANALYSIS OF CONTEMPORARY JAZZ

by

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ABSTRACT

While jazz has become more integrated into academia, the repertoire that is commonly examined is out of date. Today's leading jazz scholars tend to focus on a handful of musicians who made their mark in the '50s and '60s. But jazz writing has continued to evolve in the last fifty years, particularly in regards to harmony. Though many rooted chords—including MM7, mm7, and Mm7—can be heard in succession, the relationships between adjacent chords are obscure, and rarely manifest the standard II–V–I progression found in classic jazz. Often, successive chords belong to different diatonic sets. Some composers have eliminated chord symbols from their lead sheets altogether, leaving harmonic interpretation and relationships even more open-ended.

Since the inception of modal jazz in the late '50s, priority has been given to groups of notes and the ways that they can interact, as opposed to specific chords, keys, and function. This presents a challenge not only for harmonic analysis but also for improvising on these changes in performance. Nevertheless, pitch-class organization can often be heard to promote a hierarchical ranking amongst the chords, resulting in strong points of reference.

This dissertation develops and applies a theory of referential sets, for analyzing and improvising over representative examples of chromatic chord successions found in some contemporary jazz. By treating pitch-classes outside the collection as alterations, this theory provides a way to hear successions of seemingly unrelated chords as derived from such collections, which are in turn supported by global referential tonics. This is analogous to traditional, hierarchical ways of hearing secondary dominants and other chromaticism, but with different restrictions on the types of alterations allowed. It therefore describes more variegated progressions, and also allows referential sets to be different and larger than diatonic sets, while still providing the traditional benefits of

harmonic analysis, such as the identification of continuities, recurring patterns of root successions, cadences, and other formal processes and relations that remain paramount in much of today's jazz writing.

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To Andi… You are still, and always will be my favorite song.

CHAPTER 1
TOWARD A THEORY THAT CAN BE PLAYED

In particular ways, research for the current project began long before I started my doctorate—or even before I began to consider one. As a gigging jazz musician and improviser, I quickly discovered that many of the jazz tunes in the standard repertoire have a special feature: they involve chord progressions that use only a limited number of notes (pitch classes, usually abbreviated below as pcs), I found that I preferred playing these tunes because I could "hold on" to a relatively few notes for a long time. This afforded me more opportunity, when improvising, for musical considerations (such as shaping melodies and developing melodic motives), and demanded less thinking about theoretical ones (such as specific chord/scale relationships).[1] However, many of the less-standard compositions from the post-bop era and later tend to be less straightforward—at least in terms of pitch-class grouping. As a result, when improvising on tunes such as John Coltrane's "Giant Steps," or Bill Evans's "Very Early," I inevitably found myself changing scales quite often (sometimes at a rate of once per measure, and sometimes even more frequently) to accommodate the underlying chord changes. In essence, I was continuously reorienting myself to new keys or tonal areas. Though this approach provided me with appropriate notes with which to improvise, the result was often not musical to my mind, and would, at times, distract from my enjoyment of the performance. In certain tunes, reorientation seemed unavoidable, but in others it seemed counterintuitive.[2] For instance, extended portions of "Very Early" support hearing C as an

[1] Early tunes I favored included many from the standard repertoire, including "Autumn Leaves" (originally "Les feuilles mortes," Kosma 1945), in which I could sustain a single B♭ major scale over multiple measures, "I'll Remember April" (de Paul, Johnson, Raye 1942), or "All the Things You Are" (Hammerstein, Kern 1939).

[2] Symmetry in "Giant Steps" encourages reorientation through major keys that are related by descending major-third (B major → G major → E♭ major).

overarching tonic, but I often felt as though I wasn't "playing in C" while improvising on account of the underlying chord changes. In considering my preferred improvisational approach, issues such as this demanded attention and, in turn, motivate this dissertation.

Harmonic progressions, as well as the types of chords used in those progressions, remain a defining characteristic of the jazz style, especially since the 1960s, when the harmonic repertoire and varieties of tonality expanded greatly. Commonly, jazz tunes make use of lead-sheet notation, which specifies melody and harmony, but permits and encourages freedom in how each of these is realized in performance. Improvisation, therefore, is paramount in jazz; in fact, many describe it as one of the most important characteristics of the style.[3] Apart from realizing a notated melody (through additional ornamental notes or variations in its notated rhythm) or harmony (by using a variety of voicings and accompanimental, or "comped", rhythmic patterns), improvisation plays a central role in the overall structure of many jazz performances. Specifically, once a tune's melody, or "head", has been stated, the ensemble members commonly take turns improvising new melodies over the tune's harmonic structure. A given chord, or series of chords, will imply a collection of pcs from which an improvisation may be derived, based on the complete collection of notes involved; it is from these pcs that improvisers may construct their solo.[4] Therefore, harmony and improvisation are strongly connected, in that improvisers often rely heavily on harmony to guide their melodic choices when

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[3] As one extensive discussion of improvisation in jazz puts it, even if "improvisation is not essential to jazz, it is nevertheless a prominent feature of the idiom, one that has left its indelible mark." See Gregory Eugene Smith, "Homer, Gregory, and Bill Evans? The Theory of Formulaic Composition in the Context of Jazz Piano Improvisation," (Ph.D. diss, Harvard University, 1983), 40.

[4] Philip Johnson-Laird claims that the first constraint governing note selection in improvising is that "the current chord in a harmonic sequence suggests a particular scale from which the notes to be improvised should be drawn." As will be described in Chapter 2, this is the basic premise of chord/scale theory. See P. N. Johnson-Laird, "How Jazz Musicians Improvise," *Music Perception* 19/3 (2002), 436.

improvising. Of course, while lead sheets specify chord roots and qualities, they do not identify harmonic function. Nevertheless, an important part of playing from a lead sheet is to understand how the indicated chords participate in whatever progressions, structures, or other continuities, because this understanding supports techniques such as substitution that are fundamental to jazz improvisation.

A "useful jazz theory," then, is a theory that can be played. I am hardly alone in this pragmatic attitude. Consider, for instance, the following two excerpts:

1. Be aware of what your eyes see and what your hands feel when you play. Do this just as much as you focus your mind on the mental stuff, and you'll get beyond theory—where you just flow with the music.

2. This book is meant to be a supplement to and not a substitute for the aural musical education. This book is a resource to augment the learning experience of listening, transcribing classic jazz performances, and performing the music with peers.

In similar ways, both of the above quotations prioritize performance yet both are excerpts from jazz theory texts.[5] With performance being so essential to jazz-theoretical practice, therefore, I believe that analysis of jazz should be conducted with performance—more specifically, with improvisation—as the underlying objective.

Improvisation in jazz is often considered a form of composition, whether or not it is conducted in real time.[6] Both activities involve the stringing together of pitch material

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[5] Excerpt 1 is from Mark Levine, *The Jazz Theory Book* (California: Sher Music), vii; excerpt 2 is from Bert Ligon, *Jazz Theory Resources: Tonal, Harmonic, Melodic, & Rhythmic Organization of Jazz* (Milwaukee, WI: Hal Leonard Corporation, Inc), ix.

[6] See, for instance, Steve Larson, "Composition Versus Improvisation?," *Journal of Music Theory* 49/2 (2005), 241-275; Ed Sarath, "A New Look at Improvisation," *Journal of Music Theory* 40/1 (1996), 1-38.

in succession. Also, both are skills that require practice through repetition as well as trial and error, for just as one can compose badly, so can one improvise badly. Part of the learning process involves referring to the work of those who have come before, and who are considered masters of their craft.

Transcribing solos of recorded performances is an activity that is highly encouraged by jazz pedagogues of improvisation. Gregory Smith states that transcriptions "make it possible for the student to study more closely the compositional devices of the masters."[7] Similarly, Henry Martin notes that "musicians who wish to improvise well naturally [want] insight as to the thought processes of players they emulate."[8] When we study the transcriptions we make, the intention is not to reproduce them in performance. Instead, we attempt to discern the improvisational approach of more experienced musicians, and to understand how they navigate through various lead-sheet chord successions.[9] In cases where the succession is complex or unconventional, therefore, transcribing an improvisation by the succession's composer may provide the best, or most accurate navigational "map", since it may well represent the most definitive rendering of its chord-to-chord relationships.[10] Thus, the study of improvisations is an essential step in the search for compositional coherence.

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[7] Smith, "Homer, Gregory, and Bill Evans?," 63.

[8] Henry Martin, *Charlie Parker and Thematic Improvisation* (Lanham, Maryland, London: The Scarecrow Press, Inc., 1996), 36.

[9] This, of course, purports knowledge of the improviser's intention. In this regard, Henry Martin states how "attempting to discern the intention of the soloist *for the purposes of adjudicating the importance of musical relationship* beyond the obvious is a can of worms best avoided." At no point in this dissertation do I mean to imply knowledge of a composer's musical intentions. Instead, I simply wish to acknowledge how by playing a given succession of pitches, the improviser *may* suggest a particular reading of a chord succession and, therefore, can consider such reading as a possibility. Ibid.

[10] The ability to improvise is learned and developed by many hours in the practice room (see Larson, "Composition Versus Improvisation?," 258). So it is reasonable to assume

OVERVIEW

This dissertation develops and applies a theory of referential sets, for analyzing and improvising over representative examples of chromatic chord successions found in some contemporary jazz. By treating pcs outside the collection as alterations, this theory provides a way to hear successions of seemingly unrelated chords as derived from such collections, which are in turn supported by referential tonics. This is analogous to traditional, hierarchical ways of hearing secondary dominants and other chromaticism, but with different restrictions on the types of alterations allowed. It therefore describes more variegated progressions, and also allows referential sets to be different and larger than diatonic sets, while still providing the traditional benefits of harmonic analysis, such as the identification of continuities, recurring patterns of root successions, cadences, and other formal processes and relations that remain paramount in much of today's jazz writing.

Chapter 2 begins by surveying some of the literature relevant to this project. Following this, the chapter outlines the analytical methodology that comprises referential set theory. As a guide to the analytical approach, a list of six heuristics is presented. Given the improvisational nature of the repertoire being considered in this study, and to facilitate sensitivity to individual contexts, the analytical method must be flexible enough to accommodate the diverse compositional styles that comprise much contemporary jazz.[11] Therefore, I present the method as "heuristics" rather than, for instance, "preference rules," in order to promote the consideration of various interpretations of a phrase before deciding on one that most accurately represents one's hearing.[12] In other

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that, after composing a particular chord succession, the composer would have spent time "practicing" it before recording an improvisation.

[11] Examples of this diversity will be evident in the tunes included in Chapters 3-5.

[12] The theory of tonal music of Fred Lerdahl and Ray Jackendoff presents a list of what they call *preference rules*, which, in a particular way, correspond to experienced listeners'

words, although the analytical results presented in this dissertation represent my own hearings of the tunes being considered, the theory is designed to accommodate other hearings as well. In order to clarify the approach, Chapter 2 concludes with a brief analysis that exemplifies how I apply the heuristics.

Chapters 3-5 provide numerous applications of the theory. The tunes included in these chapters are presented more or less chronologically, with the earliest composition being released in 1962. The early works, both included in Chapter 3, are analyzed primarily to clarify some issues in the theory of referential sets, and I do not claim that they are completely representative of the contemporary style that is the focus of this study. Thus, these early analyses are not of complete tunes, though they present characteristics observed in the later works, such as rapid changes of tonality or the complete lack of functional chord progressions. The third analysis in Chapter 3 is that of a complete tune, and so more comprehensively exemplifies the application of referential set theory in its adherence to the entire methodology outlined in Chapter 2.

Chapters 4 and 5 continue by presenting complete analyses of more recent tunes, composed between 1976 and 2005, that more accurately represent the stylistic trend in contemporary jazz that interests me. Generally speaking, these pieces are less traditional, and are more chromatic. As will be shown, as the amount of chromaticism increases, so must the flexibility with which I apply the theory.

Each analysis begins by considering the lead sheet (preceded, of course, by intensive listening). I consider both the notated melody and chords to be definitive since, with the exception of the tunes composed prior to 1976, I acquired all lead sheets from

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hearings of a piece of music. Inspired by the theory of linguistic grammar, their preference rules reflect the "nature of intuitive judgments involved in motivating the theory." Fred Lerdahl and Ray Jackendoff, *A Generative Theory of Tonal Music* (Cambridge, Massachusetts: The MIT Press, 1983), 9.

the respective composers. As a result, I based my initial analytical observations on what the composer specifically notated as opposed to what the ensemble members might have realized in performance.[13] Thus, I approach each analysis in very much the same way that I might a classical score. Whenever possible, however, I consider my analytical observations from the perspective of a performer, and consider whether or not I would actually play that which I am claiming in my analysis.

Once arriving at a hearing that most accurately reflects both my theoretical and practical considerations, I turn my attention to the improvisations included on the recordings.[14] Because, as stated above, improvisations can reveal particular interpretations of chord-to-chord relationships, I consider improvisations by the composer himself, whenever possible. While the intent of the transcriptions is to evaluate my analyses of (what I consider to be) the pre-composed work, I acknowledge that my transcriptions themselves are a form of analysis. For instance, choices regarding the spelling of notes are, in effect, a decision of how to hear their relation to the supposed underlying referential collection I heard.

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[13] As will be shown, the majority of my observations regarding harmony pertain to what is notated on the lead sheet, and not to how the chords are treated in performance. The accuracy of chord changes is a concern in jazz analysis—one that, as noted by Steven Strunk, often results from the "variability of performances and written representations" of the tune being analyzed. Steven Strunk, "Wayne Shorter's 'Yes and No': An Analysis," *Tijdschrift voor Muziektheorie* 8/1 (2003), 40. It is not uncommon in jazz circles to perform tunes from informal or non-authoritative transcriptions that have circulated over the years, namely in so-called "Fake Books." With only limited exceptions, variability was not an issue with the tunes analyzed in this dissertation since the lead sheets were acquired directly from the respective composers, and the tunes are featured on only one album (these are listed in the discography at the end of this dissertation).

[14] Unless otherwise noted, all transcriptions included in this dissertation are my own. They are included for educational purposes only, under the "Fair Dealing" provisions of the 1985 Canadian Copyright Act. All transcriptions are notated at concert pitch.

In every case, I have made great efforts to notate everything I heard on the recording.[15] Because the main focus of this study concerns pitch-class content, however, I was generally less interested in rhythm while notating my transcriptions. As a result, certain transcriptions are more rhythmically approximate than others (for instance, the transcription shown in Example 3.31, Chapter 3). Further, I have not included articulation markings or such performance techniques as bends or glissandi, assuming such details do not affect the application of my analytical method.

[15] When the speed or manner of execution of a given phrase made specific notes difficult to hear, I used *Transcribe!*, a computer application, to slow down the recording without altering the pitch. Currently, I am using version 8.20, © 1998-2011, Seventh String Software.

CHAPTER 2
SURVEY OF LITERATURE
AND ANALYTICAL METHODOLOGY

A SURVEY OF ANALYTICAL APPROACHES

As for any body of music, it is possible to develop many different theories about jazz. A given theory can be understood to address particular needs in its historical and artistic context. For example, figured-bass "theory," such as it was, identified objects, and described how to realize and connect them on keyboards and fretboards. Its rules were essentially guidelines for performance. Harmonic theory, on the other hand, was more abstract and speculative, and posited concepts (such as "fundamental bass") that were intended to show an underlying commonality among apparently different objects, as well as to serve as a new way of conceiving of musical continuity. Harmonic theory could be used to compose, and to reduce complicated passages to a relatively simple and familiar pattern. Both figured-bass and harmonic theory incorporated theories of keys and counterpoint that applied to a variety of musical styles.

Theories of jazz tend to be either descriptive or analytical. According to Henry Martin's overview of jazz theory, descriptive, or "musician-based," theories can be pedagogical, concentrating on the basic elements required to realize and improvise on lead sheets in performance, as well as "speculative," suggesting more advanced and creative ways to interpret tunes during performance.[16] Analytical theories, on the other hand, take a listener's point of view, explicating " 'what is heard' by showing elements of structure, general stylistic trends, or connections to other pieces by the same or stylistically similar artists."[17] These two approaches are evident in accounts of the three

[16] Henry Martin, "Jazz Theory: An Overview," *Annual Review of Jazz Studies* 8 (1996), 1-17.
[17] Ibid, 2.

interconnected and characteristic features of jazz: chords and their connections, ornamentation and embellishment, and improvisation. The following review summarizes the literature, as a background for the analytical approach in this dissertation, which draws these three areas together in a way that unites Martin's two types of jazz theory.

An important task of any music theory is to describe the basic elements involved, and to explain the principles by which they are strung together in time. Among jazz musicians and theorists, there is no controversy about the basic elements: they are scales and chords. A scale, as it will be conceived of in the present study, is a collection of pitch classes (pcs) consisting of a referential scale degree (the "tonic") to which the remaining pcs may refer in some way. A chord is a partial ordering, in register, of some of the pcs in a scale—partial in that one member (often the root) is heard as the lowest and the other pcs are then freely ordered above it, much as is figured bass. Scales may vary in size, but given the nature of the music considered in this dissertation, they should be large enough to generate a series of chords that supports hearing the scale as its governing collection. Chord series generated from the scale should be able to accommodate every member of the scale at least once, so that the complete scale can be used as a vehicle for improvisation over the series.

With a few exceptions noted below, chords are conceived, though not necessarily played, as "tertian." That is, their members may be arranged as a series of thirds from the root. As early as the 1920s, following the influence of "barbershop," chords with sevenths and/or ninths from the root—including MM7, mm7, and Mm7—were recognized as basic in jazz harmony, with the plain triad reserved for special situations.[18] Though various types of seventh chords and other extended harmonies (triads with added notes) are used in many musical genres, including classical music of the late nineteenth and early

[18] Martin, "Jazz Theory," 10.

twentieth centuries, they are especially characteristic of jazz, as a glance through any collection of lead sheets will confirm.[19]

During the 1950s, at the start of the post-bop era, jazz continued to make use of rooted tertian chords. But as musicians continued to explore new registral arrangements ("voicings") for these pc collections—which often included extensions such as ninths, elevenths, and thirteenths, as well as their alterations—it sometimes seemed more correct to think of them as non-tertian in origin, e.g., to think of a note as a suspended fourth rather than an eleventh. A chord with a suspended fourth may, further, be conceived as a harmony in its own right, rather than as containing a suspension, if it derives from a series of fourths. In this way, non-tertian chords were incorporated into common practice, and composers began writing with chords in fourths (quartal chords) and "slash" (or poly) chords,[20] an example being the pianist McCoy Tyner, who since the 1960s has favored quartal rather than tertian harmony in his compositions and improvisations.[21]

Another important thing to consider about the basic harmonic elements is how they are ordered and how they interact with each other in progressions and sequences, and, as well, how they contribute to phrase structure and musical continuity. In jazz up until the 1950s, chord successions could be described as "functional" within a major or

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[19] Often, works that include seventh chords other than Mm7 are described as having a jazz quality to them, despite any amount of frequency of their use in previously composed works. For instance, Clifton Callender specifically identifies Ligeti's extended chords as being derived from a jazz vocabulary, and not just seventh chords in their own right. See Clifton Callender, "Interactions of the Lamento Motif and Jazz Harmonies in György Ligeti's *Arc-en-ciel*," *Intégral* 21 (2007), 41-77.

[20] A slash chord is a specified harmonic structure over which a non-chord member is played in the bass; for instance, Dmin/E.

[21] Theorist Paul Rinzler has organized Tyner's chords into categories, and has described their use as a "minor modality" that has the suspended fourth, minor pentatonic scale, and minor diatonic modes (Dorian, Phrygian, Aeolian) as its most characteristic features. See Paul Rinzler, "The Quartal and Pentatonic Harmony of McCoy Tyner," *Annual Review of Jazz Studies* 10 (1999), 35-87.

minor diatonic key; that is, they tended to be ordered so that their series of roots descended by fifth, such as in the common-practice harmonic progression II7 → V7 → I.

Composers of the post-bop era began challenging the functional expectations of their listeners by manipulating what had become the standard. For instance, the root-relationships between adjacent chords in their music are typically not fifths, and successive chords may belong to different diatonic sets. Steven Strunk has shown how tenor saxophonist Wayne Shorter characteristically likes to play with the harmonic expectations of his listeners through techniques such as using the "wrong" qualities over a common root progression (for example, Fmin7 → B♭Maj7, which alters a standard II7 → V7 in E♭ major) and using a combination of "prefix" and "suffix" "incomplete-neighbor" chords (for example, Gmin7 → A♭Maj7 → C7, where the A♭ functions as a suffix to the G, and temporarily disrupts the II7 → V7 in F major).[22] Understanding and interpreting chord successions in this style of jazz is often one of the greatest challenges for both the analyst and the performer. If they try to understand them as operating within a single key, they are often forced to segment tunes, or even phrases, into apparently unrelated progressions containing as few as only two chords.

An alternative approach to some aspects of continuity and chord choice is the study of voice leading, conceived broadly as the ways that the individual pitch classes in one chord change to those in the next. The types of voice leading that are studied vary, and can include, for instance, "maximally smooth" (in which only certain voices move by semitone while others remain fixed),[23] and "parsimonious" types (in which any of the

[22] Steven Strunk, "Notes on Harmony in Wayne Shorter's Compositions, 1964-67," *Journal of Music Theory* 49/2 (2005), 301-32.
[23] Richard Cohn, "Maximally Smooth Cycles, Hexatonic Systems, and the Analysis of Late-Romantic Triadic Progressions," *Music Analysis* 15/1 (1996), 9-40.

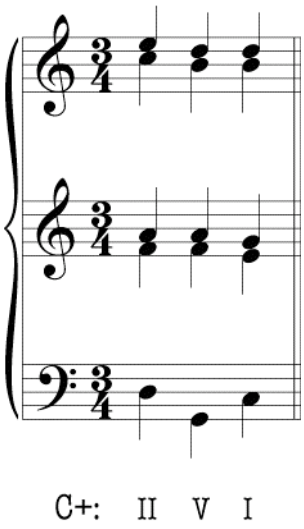
voices moves by common tone, semitone, or whole tone).[24] Dmitri Tymoczko asserts that in jazz the basic functional (fifth) progression "derives from an elementary voice-leading schema," in which the upper voices move by step and the bass leaps.[25] This is illustrated in Example 2.1 (derived from Tymoczko's Figure 10.1.1b, 353). In the excerpt, the seventh of the Chord 1 (C_5 of II) moves down by step to the third of Chord 2 (B_4 of V), while the third of Chord 1 (F_4 of II) remains constant and "becomes" the seventh of Chord 2.[26] Similarly, the seventh of Chord 2 moves down to the third of Chord 3 (E_4 of I), while the third of Chord 2 remains constant, becoming the seventh of Chord 1 (B_4 of I). Thus, the voice leading from Chord 1 to Chord 2 (two voices descending by step, two remaining the same, and the bass descending by fifth) is replicated, albeit with the motion in different voices, between Chord 2 and Chord 3. The result is a series of ninth chords in the key of C major: Dmin9 → $G7^{(add\ 9)}$ → CMaj9, which jazz musicians would accept as a typical II → V → I progression. This interchange and stepwise descent of thirds and sevenths is an essential component of voice leading in jazz, and when third/seventh pairs behave this way they are known as *guide tones*.

[24] Jack Douthett and Peter Steinbach, "Parsimonious Graphs: A Study in Parsimony, Contextual Transformations, and Modes of Limited Transposition," *Journal of Music Theory* 42/2 (1998), 241-263.

[25] Dmitri Tymoczko, *A Geometry of Music: Harmony and Counterpoint in the Extended Common Practice* (New York: Oxford University Press, 2011), 353.

[26] Throughout this dissertation, pitches will be identified by both their corresponding letter name and register, shown as a subscript integer.

Example 2.1: Basic voice leading in a jazz, II → V → I, progression (derived from Tymoczko 2011, 353)

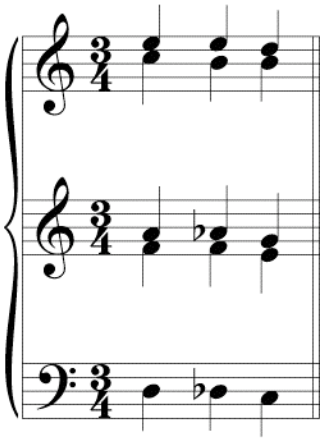


Another important ingredient in jazz vocabulary is chord substitution. The second chord in Example 2.2 (labeled "V," and read literally as D♭7$^{\sharp 9}$) is substituting for a G7 chord. This procedure is commonly described in jazz practice as *tritone substitution*. The basic idea is that because the common tones between D♭7 and G7 are the respective guide tones of each chord, these chords can function interchangeably, and support essential jazz voice leading. More specifically, the seventh of G7 (F_4 in the example) is the third of D♭7, and the third of G7 is an enharmonically respelled seventh of D♭7 (B_4 = $C♭_5$). The remaining chord tones participate in smooth voice leading in their motion to C major: <D♭, A♭> → <C, G>.[27] Tritone substitutes are most typically applied to dominant functioning chords. But, as Nicole Biamonte points out, tritone substitution can also be

[27] Of course, this results in parallel 5ths. To avoid these, other voicings are possible. For instance, the A_4 in Chord 1 could move up to $B♭_4$—the 13th of D♭7—which would then leap down a minor 3rd to G_4. However, parallel 5ths are not a concern in jazz performance practice, and occur frequently—particularly on guitar. Note that, throughout this dissertation, ordered sets will be enclosed in angled brackets, and unordered sets will be enclosed in parentheses.

applied to other chords, such as VI and II.[28] It is also worth pointing out that the composite chords representing Chord 1 and Chord 3 in Example 2.2 can be read as Dmin9 (D, F, A, C, E) and CMaj7$^{(add\ 9)}$ (C, E, G, B, D), respectively, rather than as realizations of Dmin7 and CMaj7. Liberties such as these—extending chord voicings through the addition of notes—are frequently taken by jazz musicians, resulting in a rich vocabulary of chord structures. In fact, such liberties are so common that my chord labels only reflect the most basic identity of the harmonies. That is, Example 2.2 shows only one possible version of what might be played as a II → V → I in the key of C major.

Example 2.2: Chord substitution in a II → V → I progression



A purely voice-leading account of standard progressions may seem unnecessary. But for the seemingly non-functional chord successions that have appeared since the 1960s, observations about the nature and consistency of voice leading provide insight

[28] Nicole Biamonte, "Augmented-Sixth Chords vs. Tritone Substitutes," *Music Theory Online* 14/2 (2008). In her Example 4, the end of the A Section in Duke Ellington's "Satin Doll," Biamonte describes the progression A♭min → D♭7 as a substitute for Dmin → G7. In this case, the minor quality of Dmin has been retained in the substitute chord. However, it is often the case that tritone substitutes heard over ♭6 are functioning as secondary dominants, in which the progression ♭VI7 → ♭II7 is substituting for V7/V → V7.

into how these successions may have been conceived. Considering Wayne Shorter's nonfunctional progressions, for instance, Strunk observes that they are all governed by smooth voice leading.[29] Example 2.3, recreating a portion of Strunk's Example 14, orders the pcs in the chords such that in each row (an abstract pc "voice") the change of pc is by whole tone or smaller, and the order of intervals is inverted.[30]

Example 2.3: Smooth voice leading in a non-diatonic progression by Wayne Shorter

E♭Maj7		Amin7		DMaj7
D	-2	C	+1	C♯
B♭	-1	A	0	A
G	0	G	-1	F♯
E♭	+1	E	-2	D

Ideas of voice-leading parsimony and smoothness have led jazz scholars to adopt some recent re-workings of Riemannian harmonic theory with which these ideas are strongly connected. Versions of this theory value root progressions of triads by major and minor third, and arrange chords (or roots) on two-or-more-dimensional networks (*Tonnetze*), each dimension involving a consistent change of root and/or quality.[31] Strunk uses neo-Riemannian concepts to describe progressions, such as the one given in Example 2.3, in terms of their transpositional and inversional relationships, and locates them on a *Tonnetz* configured to include major-seventh and major-ninth chords (x-axis =

[29] Strunk, "Notes on Harmony" (2005), 307. Throughout this dissertation, smooth (or parsimonious) voice leading describes a voice leading between two chords in which the individual voices move from one chord to the next by common tone, semitone, or whole tone.

[30] Steven Strunk, "Wayne Shorter's 'Yes and No': An Analysis," *Tijdschrift voor Muziektheorie* 8/1 (2003), 54.

[31] See, for instance, Richard Cohn, "Neo-Riemannian Operations, Parsimonious Trichords, and Their "Tonnetz" Representations," *Journal of Music Theory* 41/1 (1997), 1-66.

minor thirds; y-axis = major thirds). Following a discussion of the complete tune, Strunk focuses primarily on two progressions: E♭Maj7 → Amin7 → Amin7/D → DMaj7 (shown above) and B♭Maj7 → Emin7 → Amin7/D → DMaj7. Although, as Strunk says, these progressions are not functional, they involve smooth voice leading (as noted in the previous example), and their relationships can be represented as simple and nearby moves on the *Tonnetz*.

Other theorists have also considered neo-Riemannian theory and voice leading as a way of better understanding harmonic practices found in contemporary jazz. Theorist Guy Capuzzo draws comparisons between jazz guitarist Pat Martino's fretboard theory and neo-Riemannian concepts of parsimonious voice leading.[32] Specifically, Capuzzo describes how Martino organizes the guitar's fretboard into four diminished-seventh chords and 3 augmented triads, and how he sees "asymmetrical" sets, such as the perfect fourth/perfect fifth, the major and minor triads, and dominant-seventh chords, as the result of semitonal displacements of the pcs in the "symmetrical" tritone, the augmented triad, and the diminished-seventh chord, respectively.[33] Waters and Williams also incorporate neo-Riemannian theory to examine harmonic successions in Shorter's 1967 tune "Vonetta."[34] Their paper describes the tune's harmonies as subsets of various scales

[32] 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).

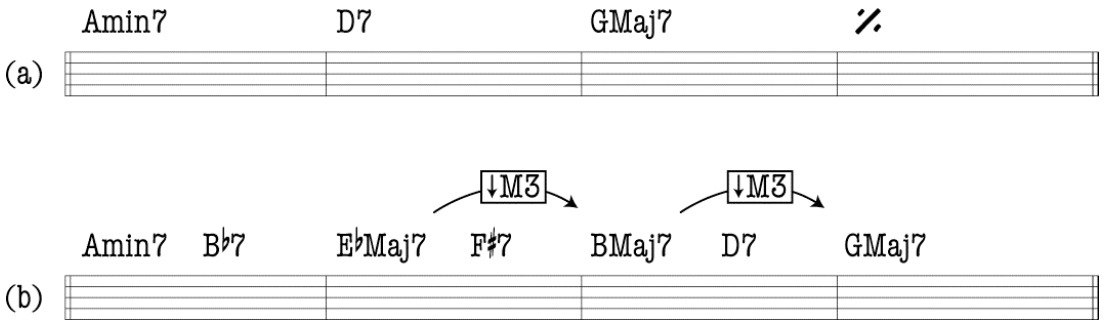
[33] Capuzzo shows how, like Carl Weitzmann, Martino achieves the complete chromatic aggregate by combining fully-diminished-7th chords with augmented triads (see also Richard Cohn, "Weitzmann's Regions, My Cycles, and Douthett's Dancing Cubes," *Music Theory Spectrum* 22/1 (2000), 91).

[34] Keith Waters and J. Kent Williams, "Modeling Diatonic, Acoustic, Hexatonic, and Octatonic Harmonies and Progressions in Two- and Three-Dimensional Pitch Spaces; or Jazz Harmony after 1960," *Music Theory Online* 16/3 (2010).

(diatonic, acoustic, octatonic, and hexatonic), and models their specific voice leading patterns on a modified, three-dimensional *Tonnetz*.[35]

One important focus of all these approaches has been the music of John Coltrane, who has been widely acknowledged as an innovator in the domain of chord successions. Influenced by the work of Nicolas Slonimsky, Coltrane explored harmonic sequences whose root motion divided the octave into equal parts.[36] "Coltrane changes," in a general sense, are a sequence of chords that, with the given tonic (or goal harmony), form a chain of major or minor thirds, which is inserted into an otherwise descending-fifth progression. The inserts are accompanied by their respective dominants. An example of this is given in Example 2.4.

Example 2.4: A II → V → I in G major (a) elaborated with "Coltrane Changes" (b)



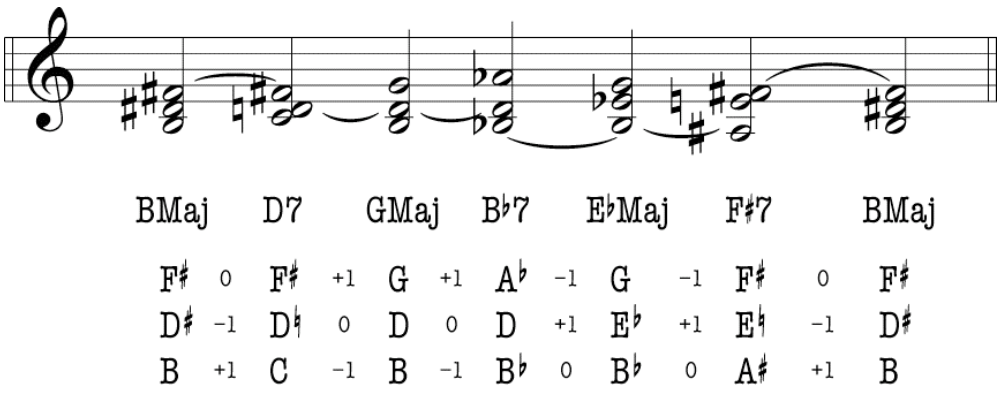
One of Coltrane's most studied compositions is "Giant Steps" (1960). Matthew Goodheart's complete analysis emphasizes the tune's symmetrical structure, based on just

[35] The acoustic scale is the fourth mode of the melodic minor scale. In jazz, this scale is also referred to as Lydian Dominant: ($\hat{1}$, $\hat{2}$, $\hat{3}$, $\sharp\hat{4}$, $\hat{5}$, $\hat{6}$, $\flat\hat{7}$).

[36] The influence of Slonimsky's "Thesaurus of Scales and Melodic Patterns" on Coltrane is one that is often noted; see, for instance, Jeff Bair, "Cyclic Patterns in John Coltrane's Melodic Vocabulary as Influenced by Nicolas Slonimsky's Thesaurus of Scales and Melodic Patterns: an Analysis of Selected Improvisations" (Ph.D. diss., University of North Texas, 2003).

intonation.[37] Masaya Yamaguchi points out how "Giant Steps" is based on a descending augmented triad—a symmetrical group with limited possibilities of transposition—then generalizes Coltrane's procedures as "multi-tonic changes" (chord progressions that emphasize more than one tonal center), a harmonic root-motion pattern that consists of pitch-class sets of limited transposition.[38] Matthew Santa analyzes "Coltrane changes" as paths through what he calls the nonatonic system.[39] In this system, chord progressions exhibit maximally smooth voice leading, and take a major triad to its respective dominant-seventh chord as well as to a Mm7 whose root is a minor third above, as shown in Example 2.5.[40] Like Yamaguchi, Santa organizes the chords in Coltrane changes into single, non-diatonic pc collections.[41]

Example 2.5: Parsimonious voice leading between major and Mm7 chords, based on "Giant Steps" changes



[37] Matthew Goodheart, "The "Giant Steps" Fragment," *Perspectives of New Music* 39/2 (2001), 63-95.

[38] Masaya Yamaguchi, "A Creative Approach to Multi-Tonic Changes: Beyond Coltrane's Harmonic Formula," *Annual Review of Jazz Studies* 12 (2002), 147-167.

[39] Matthew Santa, "Nonatonic Progressions in the Music of John Coltrane," *Annual Review of Jazz Studies* 13 (2003), 13-25. A maximally smooth voice leading is one in which no voice moves by an interval larger than a semitone.

[40] The corresponding example in Santa 2003 starts on C major; Example 2.4 has been transposed to reflect the changes in "Giant Steps."

[41] Capuzzo 2006 also discusses "Giant Steps," and compares Pat Martino's analysis of the tune, which is based on T4 cycles, to Santa's. In his analysis, Martino substitutes the Mm7 chords for mm7 chords whose root is a P5th above (for instance, D7 becomes Amin7).

The foregoing survey shows that recent theorists of post-bop jazz have focused on "jazz chords," including extended tertian and quartal structures, and the interactions between them. Their work may be taken to address the practical needs of players, and, therefore, involve aspects of "musician-based" theories. Whether finding new functional progressions or observing voice-leading consistencies, they are essentially dealing with the obvious lead-sheet objects—chords—and giving chord-by-chord analyses. There are other approaches that are not so vertical in orientation, and that open up other ways of understanding pitch succession and organization in complicated post-bop writing. However, because it is the chords that musicians commonly improvise over, a thorough understanding of how the changes work is essential. And it is evident from the insightful observations concerning "Giant Steps," that there are many productive ways of understanding post-bop chord successions.

CONCERNING IMPROVISATION

Improvisation is an integral part of the jazz style. In fact, it is perhaps principally through improvisation that a performer finds the expressive means to develop an individual and original style. Of the countless books written on improvisation, many are pedagogical, geared towards those who are new to the practice,[42] and so tend to describe which scale or scales ought to be played over a variety of chord types when improvising—a "chord/scale" theory that I will describe more fully below. What these books lack, however, are ways to develop one's playing beyond the chord/scale approach and to improvise expressively. Indeed, this cannot easily be taught. Therefore, theorists

[42] See, for instance, John Mehegan, *Jazz Improvisation 1: Tonal and Rhythmic Principles* (1959); Jerry Coker, *Improvising Jazz* (1964); David Baker, *Jazz Improvisation: A Comprehensive Method of Study for All Players* (1969); Dan Hearle, *The Jazz Language* (1980); Howard Rees, *The Barry Harris Workshop Video* (1994); Richard Lawn and Jeff Hellmer, *Jazz Theory and Practice*, 2nd ed. (1996); Mark Levine, *The Jazz Theory Book* (1996); Scott D. Reeves, *Creative Jazz Improvisation*, 4th ed. (2006).

interested in studying improvisation in jazz have focused their attention on the masters in order to get a better understanding of what gives them their unique sound.

Various approaches can be taken when analyzing a jazz improvisation. However, it is nearly impossible to conduct any in-depth analysis without a transcription of the improvisation being analyzed. Because transcriptions are rarely made by the musicians who originally perform them, the not-so-simple task of transcribing a solo, or portion thereof, involves making certain interpretive and analytical choices—for instance, the spelling of pitches used by the performers can ascribe function to those pitches, or can assert key. Steve Larson notes how, when making transcriptions of jazz performances, he is faced with a number of decisions: "Which passages contain 'mistakes'?, How precise should the notation of durations be?, Where should [one] notate a change of meter?, To which 'voice' does this note belong?, Which notes are 'ornaments'?, etc. Because the transcriptions reflect these decisions, they may be considered, to some extent, 'analyses' of the performances."[43]

Transcription is a common part of every jazz musician's practice regimen. Often they will "analyze" their transcriptions for the purpose of learning new tunes and approaches to performance, better their playing ability, and extend their vocabulary of "licks" and phrases. This approach would be included in the "musician-based" theory. Scholars have also taken such an approach, and analyzed solos for the purpose of describing the improvisational techniques and styles of leading musicians.

David Morgan analyzes improvisations of Herbie Hancock with reference to the technique of "superimposition", which occurs when the soloist implies alternate changes

[43] Steve Larson, *Analyzing Jazz: A Schenkerian Approach* (Hillside NY: Pendragon Press, 2009), 2.

than those being played by the rest of the ensemble.[44] One common method of superimposition is "side slipping," or "sidestepping," which is when the improviser moves a half step up or down from what is taking place melodically or harmonically.[45] Alona Sagee shows, through the analysis of various performances of "Walkin'," over a thirteen-year span, how Miles Davis's style of improvisation changed from one that was tonal and somewhat formulaic to another that was completely free and appeared to neglect the underlying structure of the original song.[46] Her analyses draw special attention to Davis's use of non-tonal chromaticism, such as melodic lines and harmonies that do not appear to have any discernible key or root orientation. Others have used individual performances to illustrate characteristic approaches to improvising. For instance, Karim Al-Zand finds, in an improvisation by jazz saxophonist Julian "Cannonball" Adderly, both "reflective" and "reactive" tendencies.[47] The former refers to ways that a performer develops their own ideas during the course of a performance, whether through the use of pre-established formulas or original motifs; whereas the latter describes the ways in which a performer interacts with the accompanying ensemble. It is a combination of these two tendencies that, according to Al-Zand, results in a quality solo. Dmitri Tymoczko presents an analysis of a performance of "Oleo" (Rollins 1954) by Bill Evans, which includes a complete transcription of the opening head followed by four improvised choruses.[48] Included as part of a complete chapter on jazz, Tymoczko pinpoints the various scale types, as well as melodic and rhythmic motives used by

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[44] David Morgan, "Superimposition in the Improvisations of Herbie Hancock," *Annual Review of Jazz Studies* 11 (2000-2001), 69-90.

[45] Dmitri Tymoczko identifies moments of "sidestepping" in the composed music of Chopin. See Tymoczko, *Geometry*, 375.

[46] Alona Sagee, "Miles Davis' Improvised Solos in Recordings of 'Walkin": 1954-1967," *Annual Review of Jazz Studies* 13 (2003), 27-47.

[47] Karim Al-Zand, "Improvisation as Continually Juggled Priorities: 'Cannonball' Adderly's 'Straight No Chaser'." *Journal of Music Theory* 49/2 (2005), 209-239.

[48] Tymoczko, *Geometry*, 378ff.

Evans. He also highlights particular moments of chromaticism, "sidestepping," and substitution that occur throughout the performance. As insightful as these studies are about jazz improvisation, they confine themselves to surface-level observations about "what is there" and "what the players are doing"—an approach similar to that of the practicing musician.

CONCERNING STRUCTURE AND ORNAMENTATION

Ornamentation is a common component of jazz performance. A notated melody is rarely played exactly as written, but instead is ornamented in either pitch or rhythm, or both. A player might embellish a notated melody by inserting ornamental notes, such as neighbor (either chromatic or diatonic) or passing notes. Similarly, they might alter the notated rhythm of the melody, whether or not the pitch structure is altered. Practices such as these are conducted as a manner of personal expression within a performance, and resembles the ways that continuo players were instructed to extemporize upon figured basses,[49] or the way that Mozart improvised on his themes in performance, as evidenced by written cadenzas and thematic variations.[50] Therefore, certain theorists have found it beneficial to strip away some of the variation and ornamentation using models of reductive analysis in an attempt to understand the organization of a given composition or performance.

The most important approach to reductive analysis is that of Heinrich Schenker, and Schenkerian techniques have been adapted for use in jazz analysis. One of the earliest examples of jazz research that incorporate Schenkerian analysis is Milton

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[49] Carl Philipp Emanuel Bach, *Essay on the True Art of Playing Keyboard Instruments*, trans. and ed. by William J. Mitchell (London: Cassell, 1951).
[50] Robert Levin, "Improvised Embellishments in Mozart's Keyboard Music," *Early Music* 20/2 (1992), 221-233.

Stewart's 1973 dissertation on a single performance by jazz trumpeter Clifford Brown.[51] Stewart analyzes a 1953 performance of "I Can Dream, Can't I?" (Fain, Kahal 1938) by Brown, including the tune itself as well as all four choruses of Brown's solo. He takes a strict Schenkerian approach, discussing the tune and each improvised chorus in terms of its background, middleground, and foreground structure.

Following Stewart, there have been numerous instances of Schenkerian theory being applied to jazz. Steve Larson has adapted Schenkerian techniques to analyze numerous jazz performances, including improvisations. His principal objective is to demonstrate how the analytical method can be used to show the "interaction of voice leading, harmony, rhythm, and motive, [as well as] highlight features that contribute to the distinctive character of" jazz tunes and performances.[52] He defends the use of Schenkerian techniques to analyze jazz, addressing issues such as whether or not a model designed for composed music is appropriate for that which is highly improvised, or whether or not it can accommodate chordal extensions that were not part of the music for which it was designed (such as ninths, elevenths, and thirteenths).[53] Larson's account of extensions follows from practices already established in classical music, stating that "although these dissonances may receive greater emphasis and may be treated more freely in modern jazz than in classical music, their basic meaning remains the same: a dissonance derives its meaning from more stable pitches at deeper structural levels."[54]

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[51] Milton Lee Stewart, "Structural Development in the Jazz Improvisational Technique of Clifford Brown" (Ph.D. dissertation, The University of Michigan, 1973).

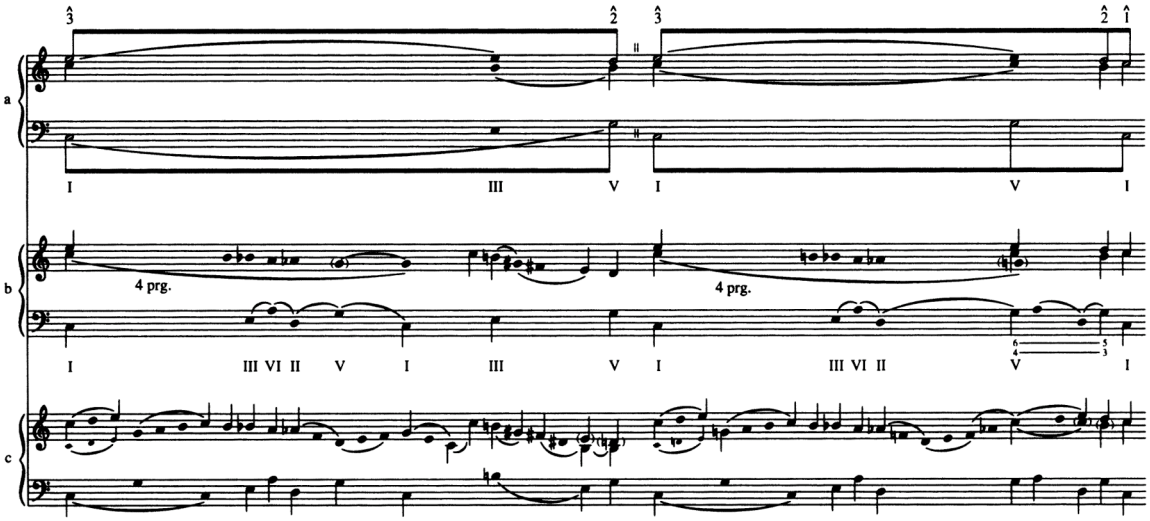
[52] Larson, *Analyzing Jazz*, 33.

[53] Steve Larson, "Schenkerian Analysis of Modern Jazz: Questions about Method," *Music Theory Spectrum* 20/2 (1998), 209-241. The latter issue is a common concern when using Schenker to analyze jazz. Example 2.7, reproduced from Martin 1996, shows how the G_4 in m. 4 is a thirteenth over B♭7 and not an appoggiatura to the following F_4.

[54] Ibid, 213. The treatment of chordal extensions used in jazz is discussed at length in Steven Strunk, "Bebop Melodic Lines: Tonal Characteristics," *Annual Review of Jazz Studies* 3 (1985), 97–120.

Example 2.6 is a reproduction of Larson's Example 18a.[55] Using Schenkerian symbology and concepts, Larson shows how the structure of the tune "The Touch of Your Lips" (Noble 1936) features an interrupted linear progression. The opening melodic gesture of the tune announces the primary structural tone $\hat{3}$ (E_5), which proceeds to $\hat{2}$ in m. 16, supported by a half cadence. The motion to V, according to Larson, involves an initial move to III that results from a bass arpeggiation of the tonic triad across mm. 1-16. Measure 17 then reintroduces $\hat{3}$ with a restatement of the opening melody. The third-progression that is the tune's *Urlinie* is completed at the end of the 32-measure tune, supported by an authentic cadence and a descent to $\hat{1}$.

Example 2.6: Schenkerian analysis of Evans's performance of "The Touch of Your Lips" (reproduced from Larson 1998)



Another issue addressed in Larson's article is whether jazz musicians truly intend to create the complex structures that Schenkerian analysis reveals. In an attempt to show that it is possible for jazz improvisations to contain formulas at levels other than the foreground, Larson 1998 continues by presenting a detailed analysis of pianist Bill

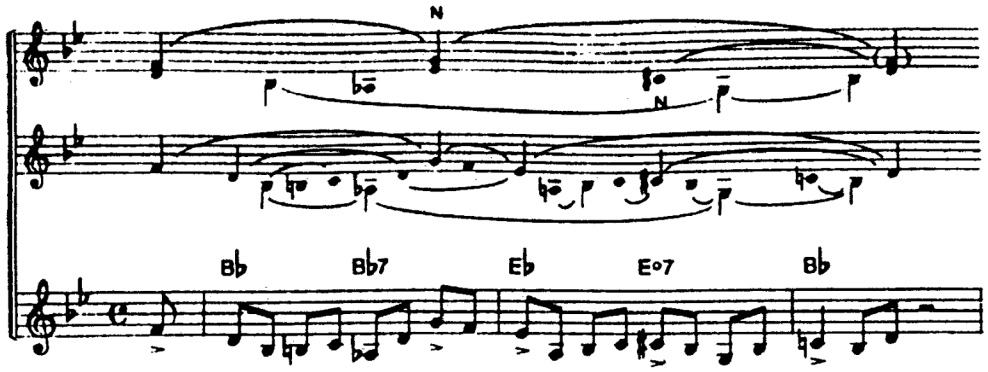
[55] Larson, "Schenkerian Analysis," 230.

Evans's performance of "The Touch of Your Lips," revealing the underlying structure in his improvisation.

In his book *Charlie Parker and Thematic Improvisation*, Henry Martin uses voice-leading models derived from Schenkerian theory to analyze various recorded improvisations by Parker.[56] According to Martin, "solo lines and melodies in bop style articulate functional changes, [and are] based on the traditional Western concept of normative stepwise motion between chord changes… Charlie Parker's skill as an improviser derives in part from his superb voice leading."[57] Example 2.7, which is taken from Martin's Example 2-7, is an excerpt from an improvisation made by Parker on the tune "Shaw 'Nuff" (Parker, Gillespie 1945)—a "rhythm change" in B♭ major ("rhythm changes" follow the chord series used in George Gershwin's "I Got Rhythm" (I → VI → II → V, etc.)).[58] The passage is mm. 13-15 of the A Section, and presents a prolongation of the tonic chord. A large-scale neighbor motion structures the excerpt, where an upper $E♭_4$ on the downbeat of the second measure ornaments D_4 on the downbeat of the first measure. Martin couples these pitches with G_4 and F_4, resulting in the dyads that are shown on the upper staff in Example 2.7. The return to D_4 in m. 3 of the excerpt is delayed until the third eighth note. According to Martin, this type of syncopation is characteristic of Parker's style, as well as of bop in general.[59]

[56] Henry Martin, *Charlie Parker and Thematic Improvisation* (Lanham, Maryland, London: The Scarecrow Press, Inc., 1996).
[57] Ibid, 13.
[58] Ibid, 18.
[59] Ibid.

Example 2.7: Voice-leading analysis of an excerpt from Parker's solo on "Shaw 'Nuff" (reproduced from Martin 1996)

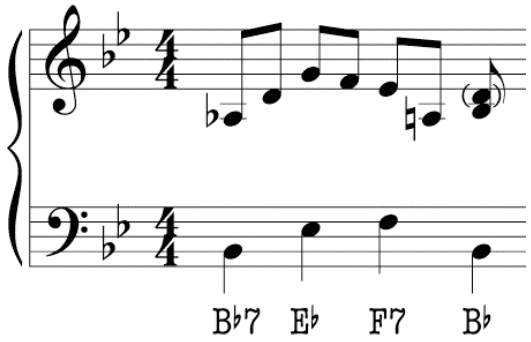


What Martin's analysis attempts to show is how a single melodic line can essentially be understood as a projection of multiple voices—in other words, a compound melody—which is structured on the principle of guide tones. The middle system in Example 2.7 shows how A♭$_3$ and D$_4$, the third and seventh of B♭7, respectively, move to G$_3$ and E♭$_4$, the third and root of E♭. However, it could be possible to hear the initial F$_4$ as prolonged through the entire first measure of the excerpt, and G$_4$ functioning as an upper neighbor. F$_4$ then steps down to E♭$_4$ in the second measure. Meanwhile, one could hear A♭$_3$ as moving up to B♭$_3$ through a passing A♮$_3$—a possibility that Martin doesn't address. Since the tune is in the key of B♭, this might suggest that A♮ is functioning as the leading tone to B♭. Because E♭$_4$ immediately precedes A♮$_3$, these could be analyzed as the guide tones of F7—the dominant of B♭, which returns in the third measure of the excerpt. Jason Titus offers this possibility, supported by a hypothetical re-harmonization of the passage, shown in Example 2.8.[60] Martin, however, includes the A♮ as part of a different voice than A♭, so as to not obscure its resolution to G. Martin states how it is "an analytical judgment just how to separate the voices—when lines begin, end, and

[60] Jason Titus, "Miles Davis' 'So What' as Modal Jazz Case Study" (Ph.D. diss., Eastman School of Music, University of Rochester, 2010), 70.

merge—but this is itself a hallmark of a sophisticated contrapuntal style, which can resist too much codification."[61]

Example 2.8: Hypothetical re-harmonization of Parker's melodic line



Martin's underlying objective is to show how the improvisations of the great Charlie Parker continually make reference to the given tune's head at various structural levels, resulting in unique and original utterances, despite the fact that they occur over common chord progressions that are often in the same key. Though the emphasis is placed on specific performances and accompanying improvisations, Martin's study of Parker is more analytically driven than it is "musician-based." More specifically, it is intended to appreciate Parker's superior ability as an improviser rather than to improve the musicianship of any reader or to offer insight into the tunes over which Parker is improvising. Martin shows that Parker's improvisations on "rhythm changes," popular song forms, and the blues references the original melodies by paraphrase, thematic variation, and harmonic variation, implying that they are much more than formulaic (as claimed by Thomas Owens[62]).

[61] Martin, *Charlie Parker*, 19.
[62] Thomas Owens, "Charlie Parker: Techniques of Improvisation" (Ph.D. diss., University of California, Los Angeles, 1974).

INTERMEDIATE REMARKS

All of these recent trends in jazz research, particularly in relation to post-bop jazz, can contribute to one's understanding of common compositional and performance practices. As the survey makes clear, the analytical approaches to jazz are various. Some engage only rudimentary theoretical concepts, such as scales and chords, that all jazz musicians deal with practically; others successfully adapt theoretical models that were originally conceived for analyzing non-jazz styles to the analysis of both traditional and non-traditional jazz writing, and that include concepts that are less commonly used by jazz players. Thus, the combined approaches can be understood as successfully encompassing both branches of jazz theory, "musician-based" and "analytical," outlined by Henry Martin.

Despite the achievements of this research, there remain certain ways that contemporary jazz research can be expanded. For instance, the canon of composers and tunes that have been studied is part of jazz history rather than its current mainstream, with the most recent composition being Wayne Shorter's "Vonetta" (1967). A vast amount of music of the last fifty years remains to be explored, much of which is even more harmonically adventurous. My exclusion of post-bop tunes, for the most part, in this dissertation, is in no way meant to discount the importance, or to ignore the significant contributions of such luminaries as John Coltrane, Wayne Shorter, and Herbie Hancock, as well as many others (including, of course, Miles Davis, Charles Mingus, Ornette Coleman, Eric Dolphy, and Cecil Taylor). But their work has received the most attention in current jazz scholarship. Therefore, one of the principal objectives of the present dissertation is to update the canon, by presenting analyses of tunes that I believe are representative of some of the current trends in jazz composition. My analyses will not only address aspects of harmony, but also incorporate melody and form. For jazz practitioners, these elements are all bound together. Thus, studying them as a totality will

lead to a better understanding of each one. No theory could be suitable for all the diverse jazz after the 1960s, but there is a consistent, substantial and actively developing repertoire that should be addressed.

Also, despite the overwhelming importance of improvisation within the jazz style, relatively little scholarly research has been done in this area, and that which has been done is rather narrow.[63] This is not to say the research is not enlightening, as when it considers the way that a particular scale may correspond with the underlying harmony of a passage (as Dmitri Tymoczko does in his analysis of Evans's solo on "Oleo"), or how a player might improvise a particular motive because it specifically relates to a given tune's head (as Henry Martin reveals in Parker's improvisations). However, it is often the case that analyses that include discussions of improvisation focus on performances of "standard" repertoire tunes, ones in which the harmonic structure is firmly based in tonality; rarely do they treat contemporary tunes with complex, non-diatonic changes.[64] Of course, techniques such as those discussed, for instance in Morgan 2000-2001 and Tymoczko 2011, are a part of the post-bop vocabulary, but the music they study is based on tonal tunes: Herbie Hancock's performances of "All of You" (Porter 1955, E♭ major), "If I Were a Bell" (Loesser 1950, F major), "On Green Dolphin Street" (Kaper 1947, E♭ major); and Bill Evans's performance, as noted previously, of "Oleo".[65]

The following discussion proposes a way to address some of these shortcomings through a concept of jazz pitch structuring that I call referential set theory, which advances the idea that specific melodic and harmonic events can be related to each other

[63] Both Steve Larson and Ed Sarath suggest that one reason less research has been done on improvisation is due to the lack of reliable "scores," or transcriptions available for reference. See Larson, *Analyzing Jazz*, 1; Sarath, "A New Look at Improvisation," 1.
[64] This is one likely reason why Steve Larson's adaptation of Schenkerian principles is so successful. The majority of the pieces that he analyzes have a clear sense of key and are, essentially, tonal through and through.
[65] Morgan, "Superimposition," 69-90; Tymoczko, *A Geometry*, 378ff.

based on shared pitch-class content. The tunes analyzed in this dissertation are not part of the "standard" canonical repertoire, and almost all of the performances that I consider include participation and improvisation by the respective composer. Throughout this dissertation, I will attempt to show that referential set theory, and the analytical method that incorporates it, goes beyond current jazz theory in order to address certain issues that earlier work has neglected, while incorporating concepts familiar to practicing musicians. Seldom does jazz research deliver both a "musician-based" and an analytical approach concurrently. This, however, is my highest priority as both an actively performing musician and a music theorist.

As a practicing jazz guitarist, I have been fortunate to study and perform with numerous musicians, many of whom are professional. Over the years, my training has included the standard pedagogy. As a result, the theory outlined in this dissertation retains certain concepts from that pedagogy in order to make it accessible to my practicing colleagues. However, aspects of these concepts have been reformulated so to more appropriately address the musical characteristics of the contemporary genre under consideration. For example, referential set theory advances the basic notion of chord/scale theory (described below) by accommodating pc-sets of any size, including non-diatonic collections, and collections with fewer than 6 or more than 8 members, which are rare in chord/scale theory. Further, it is applied to tunes that, despite sharing characteristics of the modal jazz style (described below), would not be described as "modal."[66] Accordingly, it is my hope that referential set theory can appeal to the performing musician while at the same time supporting the analytical goals of academic

[66] My use of the term "modal" here corresponds with the description that follows in the text. Of course, Keith Waters notes how, since most chords tend to have an associated scale, all jazz can to some extent be described as modal. See Keith Waters, "What is Modal Jazz?" *Jazz Educators Journal* 33/1 (2000), 55.

music theory by providing a flexible and eclectic approach to the analysis of contemporary jazz.

The point of departure for describing referential set theory and its applications is the common idea of *mode*. In contemporary jazz theory, a mode is a collection of pitch classes that can be used for composition and improvisation. As initially conceived, modes were diatonic collections arrived at by filling in the gaps between chord tones.[67] As the harmonic palette of jazz expanded, however, practitioners incorporated non-diatonic pitches, greatly extending the number and variety of pc collections. Since some of these are not diatonic, they are referred to as "chord scales," which reflects their conceptual origin. A common pedagogical approach, the study of chord scales is known as, and will be referred to in the present dissertation, as chord/scale theory.

An equally common and related concept, one that plays a role in referential set theory as I conceive it, is "modal theory." "Modal," generally speaking, refers to a particular conception of the standard diatonic modes, in which rotations of the major scale are differentiated by using their first notes as tonics, and named accordingly. But it is usually used more specifically to describe a style of jazz that emerged in the late 1950s. Modal theory, encompassing both the concept of chord/scale theory and the compositional style, can be largely attributed to the work of jazz musician and pedagogue George Russell. The following discussion will address the concepts of chord/scale theory and the modal jazz style, then proceed to show how they can be extended into a theory of referential sets. To clarify this theory, I will then present a sample analysis.

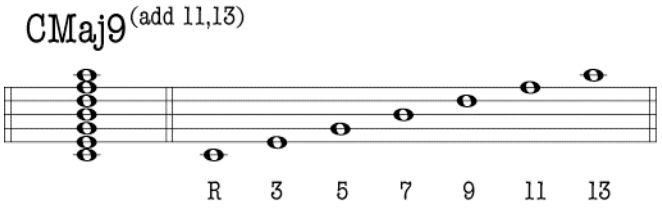
[67] Levine, *Jazz Theory*, 31-32.

CHORD/SCALE THEORY, RUSSELL, AND THE "MODAL" APPROACH

Chord/scale theory is arguably the most important topic in basic jazz theory. Generally, it maps the chords that appear on jazz lead sheets onto scales of which those chords are subsets. To the beginning improviser, it is an essential component of learning jazz vocabulary, and offers building blocks for creating a suitable improvisation. Though many practitioners will argue that learning to play jazz comes from listening to other players, transcribing recorded performances, and playing live, chord/scale theory provides a "quick fix" for improvising over changes.[68]

Prior to the conceptualization of chord/scale theory as it is currently understood, jazz musicians tended to base their solos on the melody of the tune that they were performing, and on the specific chord tones of the harmony that they were improvising over.[69] With the addition of chordal extensions beyond the seventh, including the ninth, eleventh, and thirteenth, performers soon had a complete diatonic collection at their disposal, as shown in Example 2.9.

Example 2.9: CMaj9$^{(add\ 11,13)}$ expressed melodically ("R" = root, 3 = third, etc.)

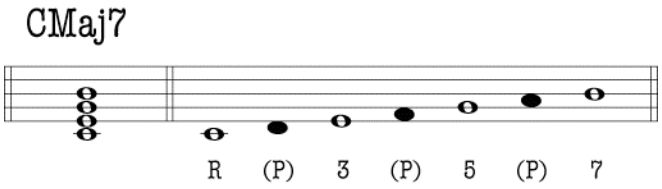


Jazz musicians realized that a simple reordering of these chord tones produced a stepwise scale. Nevertheless, their conceptualization of the scale was distinct from the

[68] "[M]astery of chords and scales, including the knowledge of which scales to use with which chords, is widely considered the *sine qua non* of jazz improvisation." Smith, "Homer, Gregory, and Bill Evans?," 76.
[69] Henry Martin and Keith Waters, *Jazz: The First 100 Years*, 2nd ed. (Belmont, California: Thomson/Schirmer, 2006), 64.

classical one. Specifically, jazz theory distinguished between the concept of a "scale" that, in a classical sense, refers to a stepwise collection of pcs that corresponds to, and in some theories,[70] even expresses a key; and the concept of a "chord scale," which is a stepwise collection of pcs that melodically expresses a chord, without explicit reference to a particular key.[71] Following this, a chord scale was understood as an arpeggiated seventh chord filled in with passing tones, for instance as shown in Example 2.10.[72]

Example 2.10: CMaj7 filled in with passing tones (P = passing tone)



The realization that rearranging stacked thirds resulted in a scale led to what is now the basic tenet of chord/scale theory: any chord can be expressed linearly by a scale of which it is a subset. Since most common types of seventh chords are included in only one or two diatonic chord-scales (or collections), chord scales can imply harmonic function in certain contexts. For instance, Example 2.11 shows one way to express Dmin7 expressed as a chord scale. Because the fifth (5) and seventh (7) of the chord are connected with a B♮, and not with a B♭, and assuming that the context is harmonically

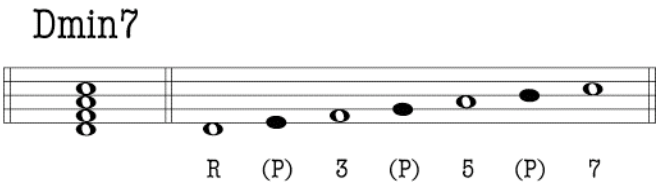
[70] Notably that of François-Joseph Fétis, *Traité complet de la théorie et de la pratique de l'harmonie* (1844), trans. by Peter M. Landey (Hillsdale, NY: Pendragon Press, 2008). See also Victor Zuckerkandl, *Sound and Symbol: Music and the External World*, trans. by Willard R. Trask (New York: Pantheon Books, 1956).

[71] Keith Salley, "Beyond Chord-Scale Theory: Realizing a Species Approach to Jazz Improvisation," *Journal of Music Theory Pedagogy* 21 (2007), 101.

[72] Filling in the chord tones, resulting in scales, is the method proposed by jazz pedagogue David Baker, among others. David Baker, *Jazz Improvisation: A Comprehensive Method of Study for All Players* (Van Nuys, CA: Alfred Publishing, 1969), 53.

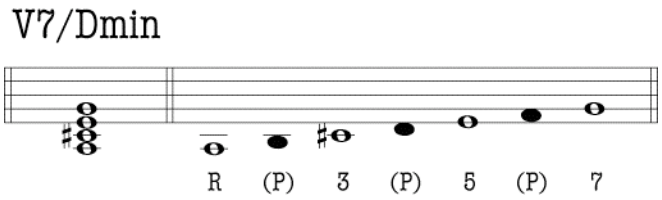
functional, it is understood that Dmin7 is functioning as either II in C major or IV in A minor.

Example 2.11: Dmin7 expressed as a supertonic chord scale (II/C major)



Early incorporation of chromaticism into improvised melodies resulted from standard chromatic chords, such as secondary dominants. In cases such as these, an improvised line would retain the chord scale of the chord being tonicized, but temporarily modify some of its members in order to accommodate the applied chord. For instance, Example 2.12 shows how an arpeggiated A7 chord that is functioning as a dominant of II in C major, is filled in with white keys so that its chord scale includes B♮, as well as F♮, as passing tones.[73] As a result, the functional identity of the goal chord, in this case II/C major, is not obscured, and A7 is sufficiently expressed.

Example 2.12: A7 expressed as a secondary dominant chord scale

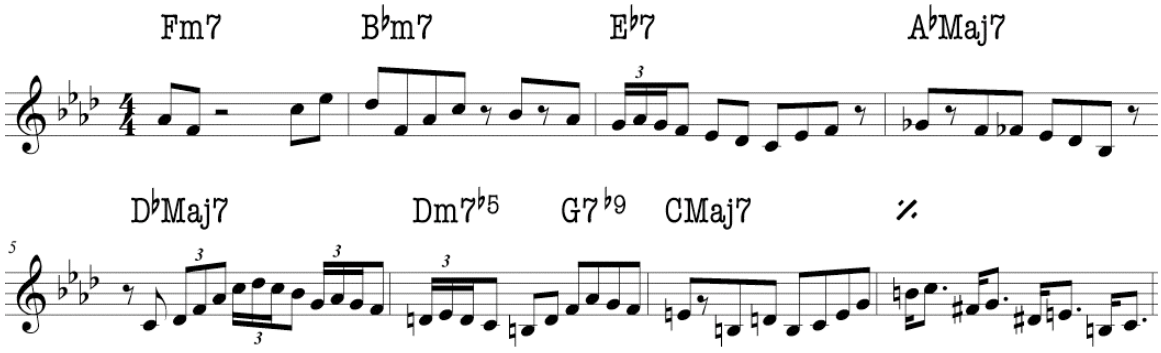


An instructive example of how chord scales can be used in practice is Example 2.13, which transcribes the beginning of jazz guitarist Grant Green's solo over "All the

[73] If D minor was a tonic chord, A7's chord scale would use B♭. Alternatively, if A7 was functioning as V of D major, its chord scale would include F♯. It should be noted that, in strict scalar terms, the chord scale shown in Example 2.12 is a rotation of D melodic minor.

Things You Are" (Jerome Kern/Oscar Hammerstein II 1939), taken from the album *Standards*, recorded in 1961.[74] Before we can fully appreciate Green's improvisational ability, however, we must first develop an understanding of the tune itself. So, prior to examining Green's solo, I will present a brief analysis of the melody and harmony as they are presented on the lead sheet, which is shown in Example 2.14.[75]

Example 2.13: Grant Green's solo, "All the Things You Are" (1:06-1:18)



"All the Things You Are" is a 32-measure AABA song form, with the final A Section (labeled as A' on the lead sheet) extended by a four-measure closing passage, resulting in thirty-six measures total. As the following analysis will explain, each section of the tune can be understood as prioritizing a different tonality, beginning with A♭ major (mm. 1-8), followed by E♭ major (mm. 9-16), G major (mm. 17-24), and then returning to A♭ major (mm. 25-36). However, because the form begins and ends in A♭ major, "All the Things You Are" can be described as *being in the key* of A♭ major, with temporary moves to secondary tonal areas, as diagrammed in Example 2.15.[76]

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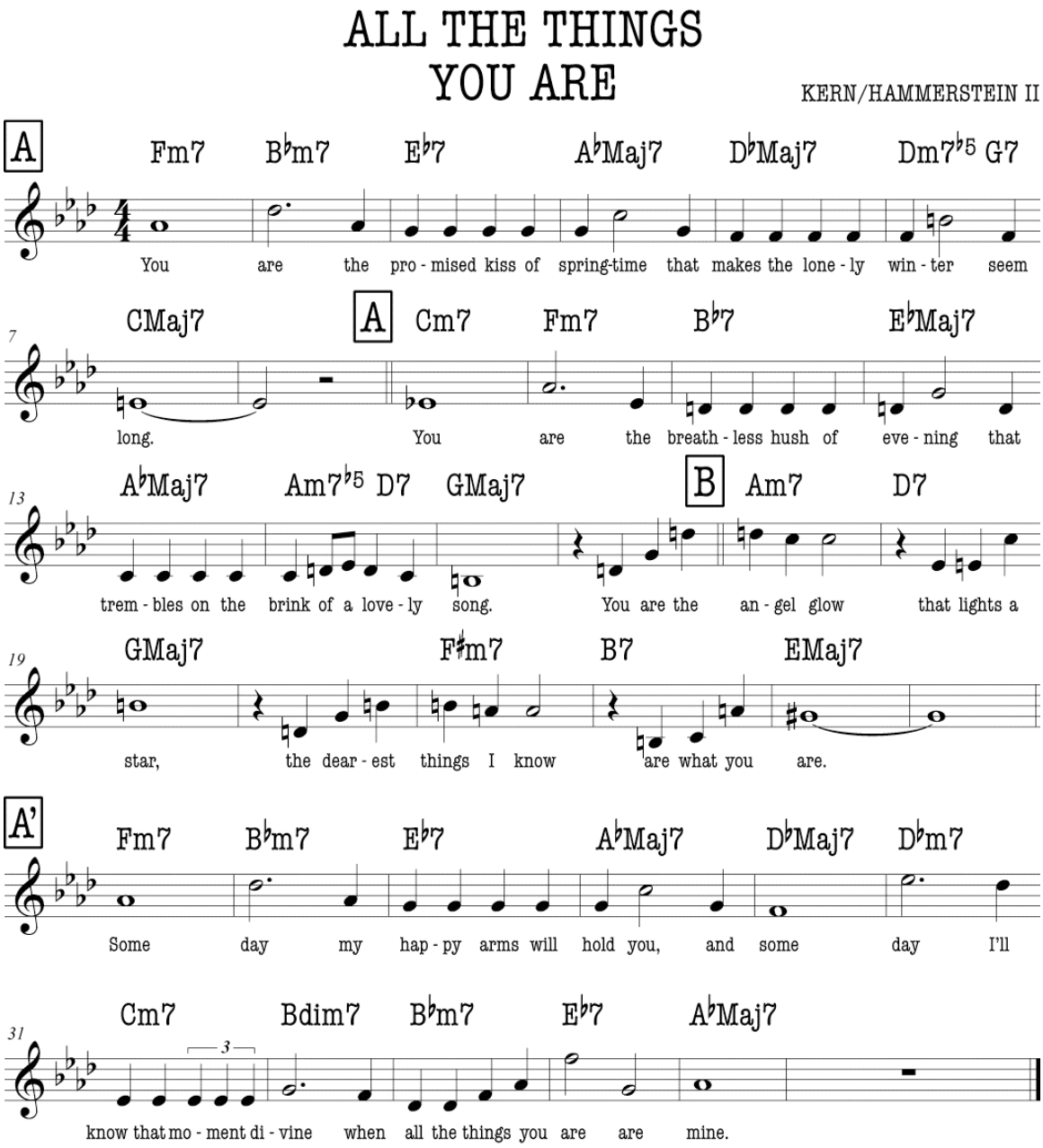
[74] Grant Green, "All the Things You Are," composed by Jerome Kern and Oscar Hammerstein II, produced by Alfred Lion (*Standards*, Blue Note 21284, 1961).

[75] Jerome Kern and Oscar Hammerstein II, "All the Things You Are," in *The New Real Book: Jazz Classics, Choice Standards, Pop-Fusion Classics* (Petaluma, CA: Sher Music Co., 1988).

[76] Henry Martin and John Check have also presented analyses of "All the Things You Are" in A♭ major. See Chapter 3 in John David Check, "Concepts of Compound Melody

Example 2.14: Lead sheet for "All the Things You Are"



All the Things You Are
Lyrics by Oscar Hammerstein II, Music by Jerome Kern

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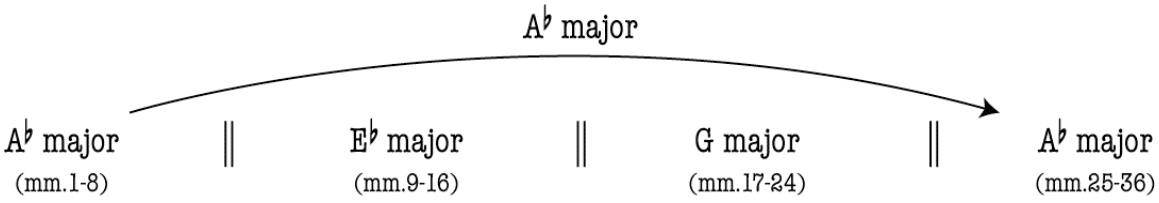
in Jazz Improvisations" (Ph.D. diss., Yale University, 1997), and Henry Martin, "Jazz Harmony: A Syntactic Background," *Annual Review of Jazz Studies* 4 (1986), 15ff. Others have analyzed this tune in F minor (see, for instance, Ex. 51 in Steven Strunk, "Linear Intervallic Patterns In Jazz Repertory," *Annual Review of Jazz Studies* 8 (1996), 97).

Example 2.15: The tonal scheme of "All the Things You Are"



The theoretical survey presented earlier made it clear that, when analyzing chord progressions in jazz, it is rather common to use Roman numerals, and many theorists do so without special justification.[77] Likely reasons for their frequent use are that they facilitate transposition, which is common in jazz (especially in vocal jazz), and they indicate chord relationships and function, aiding in improvisation.[78] Accordingly, Example 2.16 provides a Roman numeral analysis of the opening A Section in "All the Things You Are." The harmonies cycle through a diatonic-fifth progression, beginning with VI in A♭ major (Fmin7), which may be taken to function as a tonic substitute (labeled "Isub" on the example). In m. 5, D♭Maj7, which is IV in the A♭, is reinterpreted as ♭II, or a Neapolitan chord, in C major. Following this, a IImin7$^{\flat 5}$ → V7 progression tonicizes CMaj7, which then lasts for two measures.[79] The second A Section is

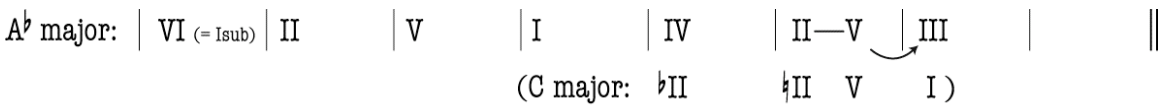
[77] See, for instance, Henry Martin "Jazz Harmony: A Syntactic Background." *Annual Review of Jazz Studies* 4 (1986), 9-31; Patricia Julien, "The Structural Function of Harmonic Relations in Wayne Shorter's Early Compositions: 1959-1963," (Ph.D. diss., University of Maryland, College Park, 2003); Steven Strunk, "Wayne Shorter's 'Yes and No': An Analysis," *Tijdschrift voor Muziektheorie* 8/1 (2003), 40–56; Keith Waters, "Modes, Scales, Functional Harmony, and Non Functional Harmony in the Compositions of Herbie Hancock," *Journal of Music Theory* 49/2 (2005), 333-57. In fact, likely the most commonly used progression in jazz is consistently described using Roman numerals: II → V → I.

[78] According to Henry Martin, John Mehegan was the first to insist on using Roman numerals to describe chord progressions in jazz. See Martin, "Jazz Theory," 8.

[79] This common-tone progression happens frequently in jazz tunes, such as in "Solar" (Miles Davis, *Walkin'*, 1954) and "Blue Bossa" (Kenny Dorham, on Joe Henderson's *Page One*, 1963). In it, the root of ♭II moves to the root of the half-diminished-seventh that is a half step above, while the remaining notes are held in common. Typically, it is used as a cadential progression in a minor key (both "Solar" and "Blue Bossa" are in C

transposed down a perfect fourth, beginning in E♭ major, and concludes with a tonicization of, and resolution to, GMaj7. Thus, A♭ major is further emphasized through tonicizations of the notes of its tonic seventh-chord: <A♭, C, E♭, G>.

Example 2.16: Roman numeral analysis of A Section (mm. 1-8), "All the Things You Are"



The melody for "All the Things You Are" is primarily diatonic, each section containing pitches that are exclusive to the diatonic collection of its respective tonal center.[80] The melody emphasizes the third of each harmony, resulting in parallel tenths between the melody and the chord root, as shown in Example 2.17a. This is an example of what Steven Strunk refers to as a linear intervallic pattern, which he describes as "a voice-leading pattern made up of streams of repeated intervals or pairs of intervals between the outer voices of a musical texture."[81] In the example, we can see how the third of one chord "becomes" the seventh of the next, which in turn resolves down by step to the third of the next chord. Accordingly, this melody can be considered a representative example of guide tones. However, when considering the melody on its

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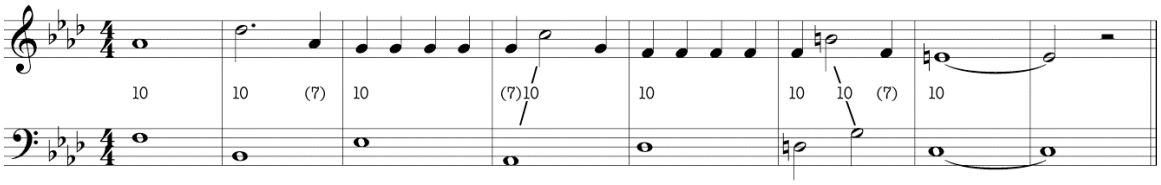
minor). In the case of "All the Things You Are," one expects a tonicization of III in A♭ (C minor). Upon the arrival of CMaj7 in m. 7, we are reminded of a *tierce de Picardie*, where the third of the minor chord is raised by a semitone, resulting in a major chord. The use of Dmin7$^{\flat 5}$, as well as G7$^{\flat 9}$, makes the transition to C major smoother on account of chord tones that are diatonic members of A♭ major—specifically, the note A♭.

[80] An exception can be found in m. 18, where the ♮9 over D7 (E_4) is preceded by a ♭9. C_4 in m. 22 (♭9/B7) might also be understood as a chromatically altered C♯ in E major, or as a result of modal mixture.

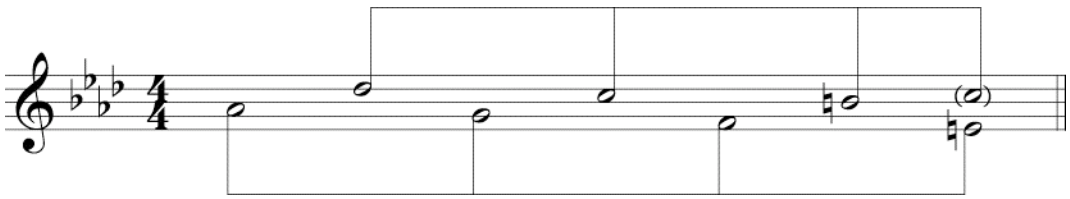
[81] Steven Strunk, "Linear Intervallic Patterns In Jazz Repertory," *Annual Review of Jazz Studies* 8 (1996), 63. In the specific case of "All the Things You Are," Strunk identifies a 10-7 pattern, thus prioritizing the $A♭_4$ in m. 2 over the $D♭_5$ and the G_4 in m. 4 over the C_5; the 7ths are shown in parentheses in the my Example 2.17a. I tend to hear the parallel 10ths alone as creating the more structural melody.

own, it is also possible to identify two patterns of stepwise motion across the phrase—an example of compound melody, as shown in Example 2.17b. I hear the lower of the two voices as principal, since it extends across the entire phrase (as opposed to the upper voice, which begins in m. 2 and ends with an implied note in m. 8), stepping through the interval series <–1, –2, –1>: <A♭, G, F, E♮>. This continues in the next eight measures, with the notes <E♭, D, C, B♮>, and into the B Section, with <C, B, A, G♯>.[82] The melodic $G♯_4$ in mm. 23-24 ($\hat{3}$/E major), which closes the B Section, is an enharmonically reinterpreted A♭—the principal, or most referential, pitch in the closing A' Section, and in the tune overall.

Example 2.17a: Parallel 10ths in the opening phrase of "All the Things You Are" (mm. 1-8)



Example 2.17b: Compound melody and conjunct motion in melody (mm. 1-8)

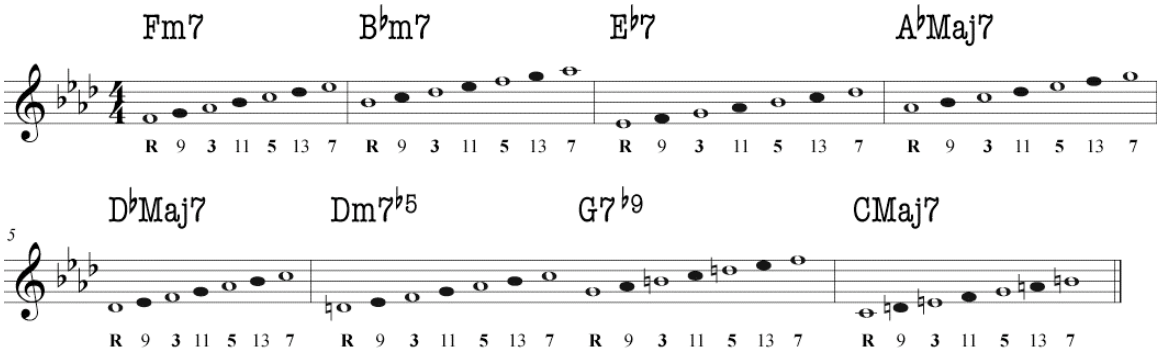


Following from these analytical observations, an improviser could construct an appropriate series of chord scales across the first eight measures of "All the Things You Are." These are shown in Example 2.18. The example only contains the first seven measures, as the same chord scale is understood in mm. 7-8. In the example, open

[82] The opening pitches of these first three interval series transpose through the A♭ major triad, beginning, respectively, on A♭, E♭, and C. This provides further support for A♭ major as the tune's overarching key.

noteheads represent chord tones of the underlying chords (where R = root, 3 = third, etc.), and filled-in noteheads represent non-chord tones.[83] In m. 5, despite the dual-function of D♭Maj7 described above (IV in A♭ major and ♭II in C major), the notes of A♭ major are used to construct the chord scale since it reflects the most basic understanding of the chord, and supports the overarching tonality of the tune. The chord scales in m. 6 are based on a tonicization of C minor, or III in A♭ (see footnote 80), so that the chord tones of the underlying seventh chords are filled in with members of A♭ major (as in Example 2.12).[84] In mm. 7-8, the notes used to construct the chord scale has been changed from A♭ major to C major in order to represent C's temporary tonic status. The general implication is that, in each measure, the entire chord scale can be used to improvise over these changes.

Example 2.18: Chord scales in "All the Things You Are" (mm. 1-8)



Let us now return to Green's improvisation over the opening eight measures of the tune. Example 2.19 analyzes each measure according to the chord scales shown in Example 2.18, grouping the notes in each measure as either a chord tone (CT = root (R),

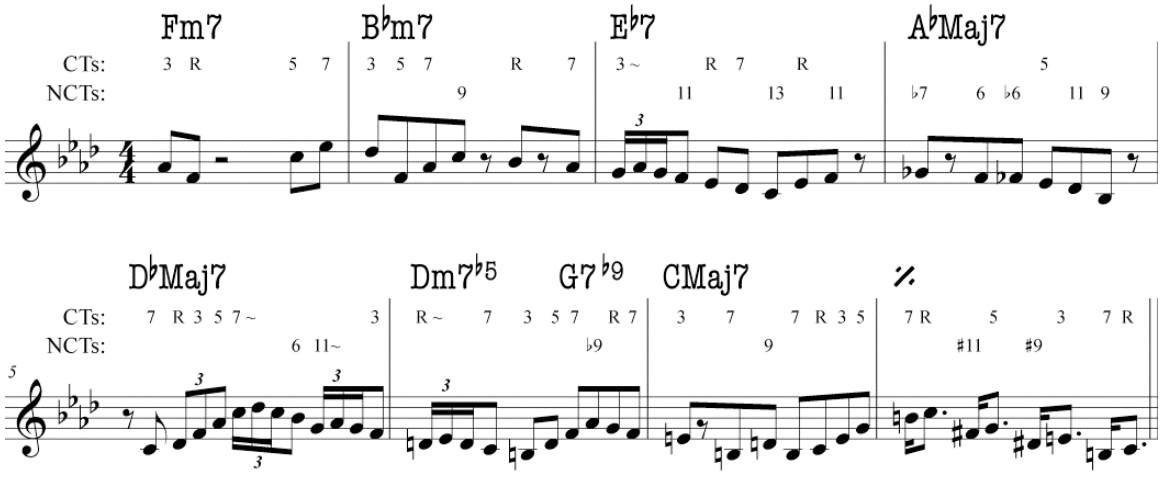
[83] This follows from a traditional understanding of chord tone and non-chord tone, such as that shown in Example 2.10. Therefore, chord tones only extend up to the seventh, and exclude the ninth, eleventh, and thirteenth.

[84] A more contemporary reading of these chord scales is D Locrian and Mode 5 of C harmonic minor (sometimes called G *double-harmonic* major).

third (3), fifth (5), or seventh (7)) or non-chord tone (NCT). We can see that, in almost every measure, Green adheres to the CTs of the underlying seventh chords, and that the NCTs are used primarily as ornaments of adjacent CTs. For instance, C_5 in m. 2 (the ninth above B♭) functions as an incomplete neighbor (IN) to the following of $B♭_4$.[85] Similarly, C_4 in m. 3 can be understood as an IN to the chordal 7th, $D♭_4$, which subsequently returns to the root, $E♭_4$. In mm. 3, 5, and 6, the sixteenth-note-triplet neighbor figures are represented with a "~" beside the principal note that is being ornamented. For instance, in m. 3, G_4 (the third of E♭7) is ornamented with an upper-neighbor, $A♭_4$; the analysis represents this with "3~" above the figure. This figure is repeated twice in m. 5, where the seventh and eleventh of D♭Maj7 are ornamented by upper-neighbors, and again in m. 6, where the root of Dmin7♭5 is similarly ornamented. Conflict arises in m. 4, where Green not only significantly limits his use of CTs, but also introduces chromatically altered NCTs. Further, Green's line in m. 6 suggests the possibility that he was hearing the second chord, G7♭9, starting on beat two; the CT/NCT analysis has been adjusted in favor of this hearing. Issues such as these suggest that Green was either hearing chord changes other than those included on the lead sheet, using personal expression to produce a unique improvisation, or simply making mistakes. Nonetheless, the example shows how a chord/scale approach to "All the Things You Are" can generate an appropriate improvisation.

[85] It may also be possible to hear C_5 as a passing tone between $D♭_5$ on the downbeat of the measure and $B♭_4$, as part of a compound melody.

Example 2.19: Chord scale analysis of Green's solo, "All the Things You Are"

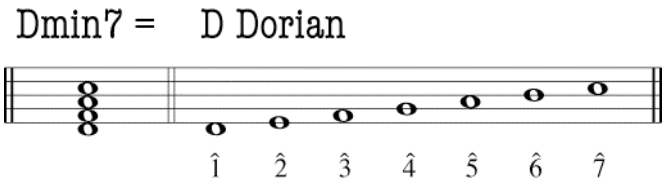


As jazz musicians became more and more proficient in the chord/scale approach to improvisation, further chromaticism was introduced. Andrew Jaffe describes how the notes that are used to fill in between the chord tones when constructing a particular chord scale fall into two categories: those that are members of the governing diatonic collection, which Jaffe refers to as "tensions" or "extensions," and those that are not and accordingly must be considered and treated as dissonant.[86] Notes that fall into the second category, according to Jaffe, must not be (1) leapt from, except in the case of a double-neighbor, (2) followed by a rest, or (3) allowed to last too long.[87] In the Green excerpt, F♭$_4$ (m. 4) is not a member of the A♭ diatonic collection governing this part of the passage and is, therefore, functioning as a chromatic passing tone. Similarly, we can understand G♭$_4$ (m. 4), as well as F♯$_4$ and D♯$_4$ (m. 8) as falling into Jaffe's second category.[88]

[86] Andrew Jaffe, *Jazz Theory* (Dubuque, Iowa: Wm. C. Brown Company Publishers, 1983), 49.
[87] Ibid, 26.
[88] Technically, then, Green is breaking Jaffe's rules by resting (briefly) after the G♭$_4$ (m. 4).

As the chord/scale approach to improvisation continued to develop, its application became more and more generalized. Eventually, each chord type was understood as having its own governing collection that most accurately reflected it, based on a maximum correspondence of chord tones and traditional harmonic function. Jazz musicians began recognizing chord scales not as filled-in arpeggiations, but as scales in their own right, as shown in Example 2.20. Technically, these "scales" would more properly be regarded as keys, involving both a tonic, which is the root of the chord, and a mode, which specifies the interval pattern the remaining pcs form when arranged in steps above the tonic.

Example 2.20: Dmin7 expressed linearly as D Dorian

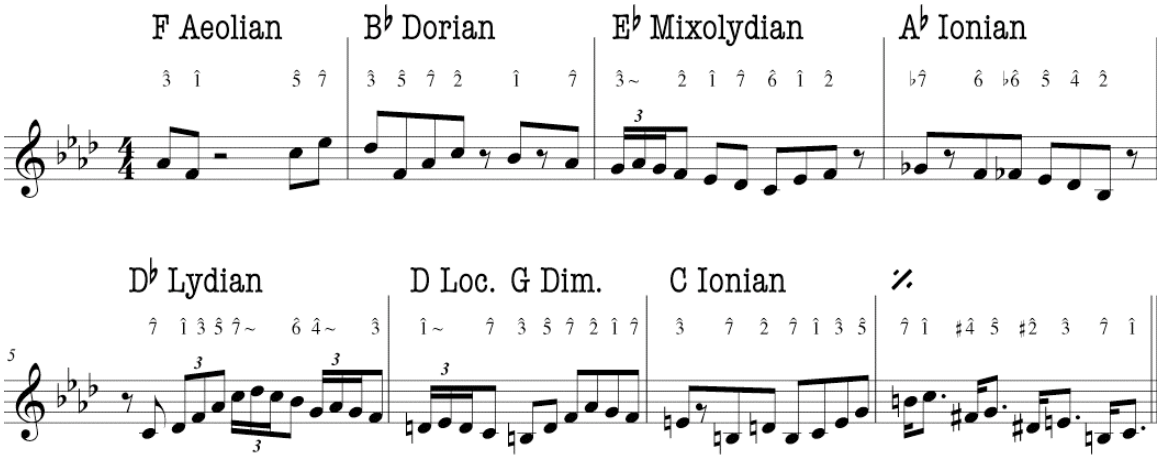


This generalization reflects the common practice of contemporary chord/scale theory, as prescribed by Mark Levine and others. Levine's chord/scale theory is based on only four types of pc collections: major, melodic minor, diminished (octatonic), and whole tone.[89] Generally, these four source collections might more accurately be thought of as scale families since Levine describes the common use of each scale in all of its rotations. Thus, the major scale encompasses all seven diatonic modes (Ionian, Dorian, Phrygian, Lydian, Mixolydian, Aeolian, and Locrian; Example 2.20 provides an example of this). According to Levine, "the reason why jazz musicians think of scales, or modes,

[89] Levine's diminished scale includes both of the octatonic collections, starting with a half step (used with altered dominant chords) and starting with a whole step (used with fully-diminished seventh chords). See Levine, *Jazz Theory*.

when they improvise, is because it's easier than thinking in terms of chords."[90] Following this, Example 2.21 modifies the analysis of Example 2.19 by labeling each note as a scale degree within its corresponding mode, with chromatic alterations by the accidentals included before the corresponding scale degree (♭ or ♯).[91] Further, for sake of clarity, chord symbols have been replaced by their corresponding mode names. Note how, in m. 6, Dmin7$^{\flat 5}$ corresponds with the mode D Locrian, a rotation of E♭ major: <D, E♭, F, G, A♭, B♭, C>. Similarly, G7$^{\flat 9}$ is replaced by G diminished: <G, A♭, A♯, B, C♯, D, E, F>.[92]

Example 2.21: Modal analysis of Green's solo



THE LYDIAN CHROMATIC CONCEPT

A major proponent of chord/scale theory, with its association of various chords to particular modes, is George Russell, author of *Lydian Chromatic Concept of Tonal*

[90] Levine, *Jazz Theory*, 32.

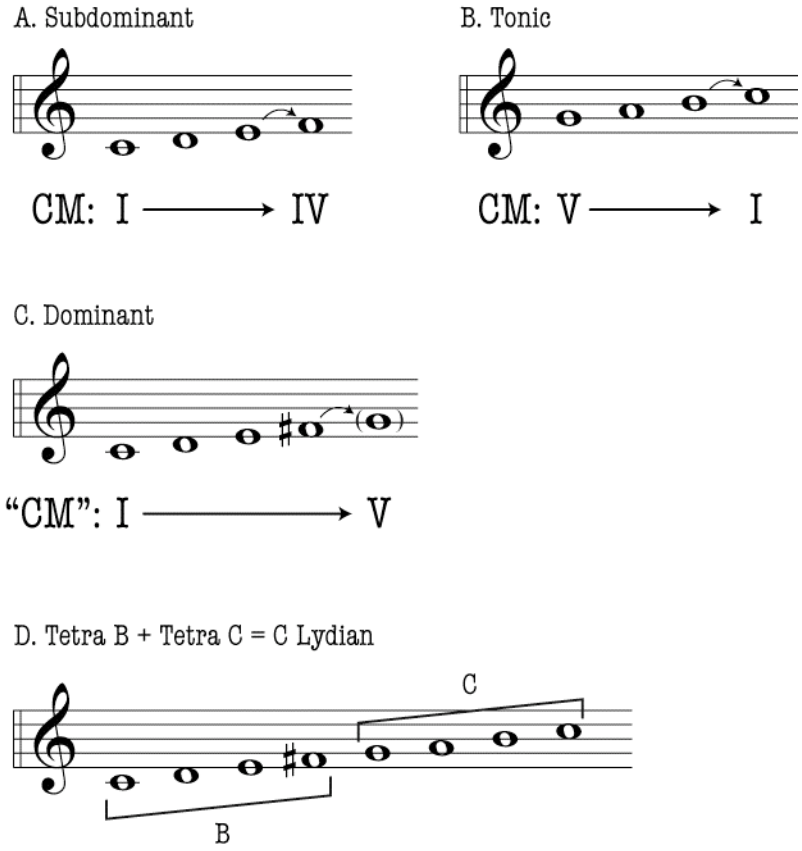
[91] Scale degrees are kept within an octave and, therefore, use, for instance, $\hat{2}$ rather than $\hat{9}$.

[92] These selections of modes are common scale choices over the progression IImin7$^{\flat 5}$ → V7$^{\flat 9}$. However, they do not represent the only possible options since the harmonic minor scale isn't included in Levine's scale families.

Organization for Improvisation.[93] This treatise proposes a unique method of improvising over various chord types using pc-sets derived exclusively from the Lydian mode; Russell's basis for prioritizing this mode in particular is shown in Example 2.22. He posits that, when dividing the major (Ionian) scale into two tetrachords, the lower tetrachord (Example 2.22a) suggests a resolution to the subdominant as a result of its interval structure, since $\hat{3}$ sounds like a leading tone to $\hat{4}$. Harmonically speaking, this tetrachord supports a I → IV progression (as represented by the Roman numerals in the example). The upper tetrachord (Example 2.22b) suitably resolves to the tonic, when $\hat{7}$ proceeds to $\hat{1}$, and supports a V → I progression (as represented by the Roman numerals in the example). Accordingly, the two tetrachords of the Ionian mode prioritize the subdominant and the tonic (IV and I, respectively). By altering the interval structure of the lower tetrachord, raising $\hat{4}$ by one semitone, priority can be shifted from the subdominant to the dominant (Example 2.22c). The result of combining this altered lower tetrachord with the unaltered upper tetrachord is the Lydian mode (Example 2.22d). Thus, Russell's theory, or "concept," claims that the Lydian mode is the most suitable choice for reflecting traditional tonic-dominant tonal organization.

[93] George Russell, *The Lydian-Chromatic Concept of Tonal Organization for Improvisation*, 2nd ed. (New York: Concept Publishing Corp, 1959).

Example 2.22a-d: Russell's bias for the Lydian mode (with C tonic)

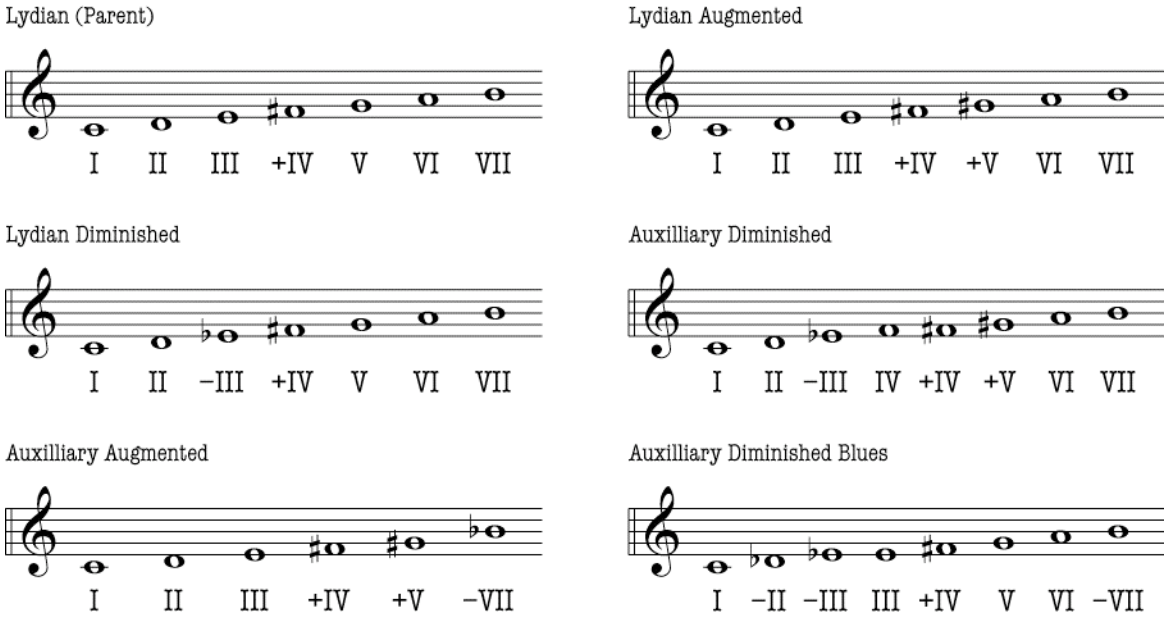


Of course, Russell's concept conflicts in important ways with that of traditional tonal theory. Specifically, by prioritizing the Lydian mode, Russell distorts the relationship between a given tonic and its "under dominant," as a result of the augmented-fourth (or diminished-fifth) between $\hat{1}$ and $\hat{4}$. As a result, the subdominant does not exist in Russell's world—at least not in a traditional sense.

Whether or not one agrees with this conception of tonality, it is significant because Russell asserts that every chord can be converted into a scale that best conveys its sound. This conveyance is achieved through the determination of which Lydian mode contains all the members of an underlying chord. For instance, the scale that best conveys

the sound of A7, according to Russell, is G Lydian: <G, A, B, C♯, D, E, F♯>. Russell refers to this scale as the chord's "parent scale."[94] Along with the parent scale, Russell's theory includes five other scales from which a musician can improvise a melody, which are shown in Example 2.23.[95] The amalgamation of these six scales is the 12-tone "Lydian Chromatic Scale." As a general guide to improvising with these scales, Russell suggests prioritizing the chord tones of the underlying harmony, while using the remaining notes to add color.[96]

Example 2.23: Russell's six scales for improvising



Russell refers to the conversion of a chord into its parent scale as "vertical polymodality." In this approach, it is the chord (vertical) that dictates the improviser's choice of scale. Thus, vertical polymodality advocates a one-chord-at-a-time approach to

[94] Russell, *Lydian-Chromatic*, 2.
[95] These scales are the same as the Lydian mode, the third mode of melodic minor, the fourth mode of harmonic major (Ionian scale with a ♭$\hat{6}$), the octatonic scale beginning with a whole step, the whole tone scale, and the octatonic scale beginning with a half step, respectively.
[96] Russell, *Lydian Chromatic*, 8.

improvising. Because a single chord can be "colored" by any of the scales that are related to a given parent scale, Russell considers his approach to be "polymodal."[97] In contrast, therefore, to a more traditional arpeggiated approach, Russell's polymodality provides the improviser with an expanded resource of pitch material, since any of the twelve pcs can be used while improvising.

Following his discussion of vertical polymodality, Russell describes an alternate approach to improvising, which he refers to as "horizontal polymodality." In the former approach, one chord is converted into multiple scales. Alternatively, in the latter approach, one scale is imposed upon a series of chords. According to Russell, "there are times when rapidly moving chord progressions make improvising difficult. The improviser isn't allowed time to create good melodic ideas when thinking vertically [i.e. changing scales with each chord]. It is at times such as these that we find the use of horizontal scales to be more useful than vertical scales."[98]

In horizontal polymodality, Russell adds two more "horizontal" scales to his collection: the major (Ionian) scale, and the blues scale. These scales can be used in cases where two or more chords suggest a particular tonic. For instance, in the chord series CMaj → Amin → Dmin → G7 → CMaj, a single C major scale can be used as a vehicle for improvisation.[99] Similarly, in a 12-bar blues in the key of A, a single A Blues scale can be used to improvise over all twelve measures. Russell's choice to use horizontal polymodality is based on three factors: the resolving tendency of two or more chords (functional chord progressions), the key of the music, and aesthetic judgment.

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[97] Once a parent scale has been determined, a musician is free to draw from the members of any of the six scales when improvising, thus "poly." Of course, because Russell refers to these collections as scales, and not as modes, his approach might more aptly be named "poly*scalar*."

[98] Russell, *Lydian-Chromatic*, 35.

[99] As opposed to using the "parent-scale" series <C Lydian, C Lydian, F Lydian, F Lydian, C Lydian>, which would derive from vertical polymodality.

The distinction between vertical, chordal playing, and a more linear, or horizontal approach to playing has been described by others as well. For instance, Wolf Burbat distinguishes between "vertical improvisation," in which the particular scale in use changes with each chord, and "horizontal improvisation," in which a single scale is used over changing chords.[100]

Both of the earlier analyses of Grant Green's solo on "All the Things You Are," shown in Examples 2.19 and 2.21, are vertical in orientation. Green's solo, however, can be reinterpreted as representing the basic conception behind Russell's horizontal polymodality and Burbat's horizontal improvisation.[101] Though the earlier analyses are consistent with conventional methods of understanding jazz solos, and make clear what Green is playing, there is a simpler hearing in which the entire passage is, for the most part, made up of two diatonic collections. Specifically, Green's solo comprises a single A♭ major (Ionian) collection in mm. 1-5, and a C major (Ionian) collection in mm. 6-8. In Russell's terms, pcs A♭ and C function as tonic stations ("tonics to which two or more chords tend to resolve"[102]), and the corresponding scales that Green uses provide an example of horizontal polymodality. The chromaticism that occurs in mm. 4 and 6 can be interpreted as altered notes within those collections.[103] Example 2.24 analyzes Green's solo as being made up exclusively of members of the aforementioned collections, A♭

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[100] Wolf Burbat, *Die Harmonik des Jazz*, 4th ed., (München, Kassel, Basel, London, New York: DTV and Bärenreiter, 1994; unpublished English trans. by Robert Wason), 16.

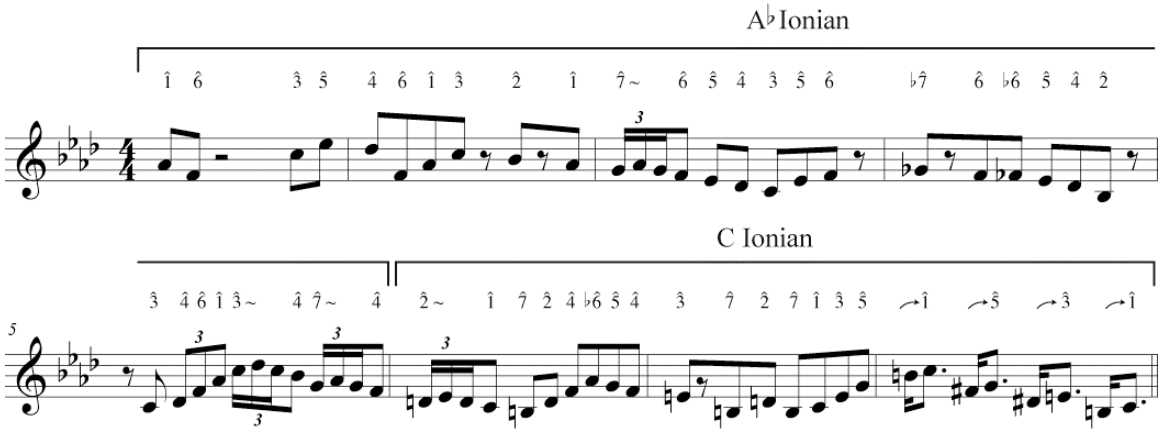
[101] In discussing his approach, Russell uses the changes from the opening A section of "All the Things You Are," though he doesn't make reference to the title. See Russell's "The 'River Trip' Explanation of Jazz Improvisational Styles" in *Lydian Chromatic*, xviii-xix.

[102] Ibid, 29.

[103] G♭$_4$ in m. 4 is understood as a chromatically altered $\hat{7}$ in A♭ major. F♭$_4$ is clearly functioning as a chromatic passing tone between F$_4$ and E♭$_4$, or $\hat{6}$ and $\hat{5}$ in A♭. In m. 6, since CMaj7 (and not Cmin) is the harmonic goal in the following measure, the E♭$_4$ and A♭$_4$ can both be understood as alterations of members of a C major collection, which have been carried over from A♭ major.

major and C major, respectively. All pc members from each scale are used, as Green elegantly moves through the passage, connecting one measure to the next almost exclusively with stepwise motion. Green's complete statement of these collections supports the idea that they are sufficient, and appropriate, for melodically realizing the underlying chord progression. Further, we can see how conceiving of Green's solo horizontally more accurately accounts for melodic motion that occurs across the bar. For instance, G♭4 can be analyzed as a chromatic upper-neighbor to the F that is played on either side of it. Accordingly, we might choose to describe A♭ major and C major as the most referential pc-collections for the given harmonic situation. This is compared to a vertical approach, which is advocated in chord/scale theory, and which changes mode for every chord—modes that are, in essence, rotations of the same seven pcs.

Example 2.24: Green's solo on "All the Things You Are," prioritizing A♭ Ionian and C Ionian



THE "MODAL" STYLE: A COMPOSITIONAL APPROACH

Chord/scale theory in general, and George Russell's theory in particular, led to the development of the compositional trend known as modal jazz. This style emerged in the late '50s and early '60s as a reaction against the fast-paced harmonic rhythm found in

bebop tunes and the harmonic complexity found in some post-bop.[104] It is often associated with renowned jazz practitioners such as Miles Davis and John Coltrane, but characteristic features have also been connected to others, including Wayne Shorter, Joe Henderson, and Herbie Hancock.[105]

Definitions of what actually constitutes modal jazz vary, some so basic as "few chords, lots of space,"[106] but it has several characteristics that, as many commentators agree, are intended to facilitate improvisation.[107] One is slow harmonic rhythm, in which a single harmony can be held for four, eight, or even sixteen measures. For example, the frequently cited Miles Davis tune "So What" (Miles Davis, *Kind of Blue,* 1959) consists of sixteen measures of Dmin7, followed by eight measures of E♭min7 before returning to another eight measures of Dmin7. The slow changes provide "ample room for experimentation with melodic creation and development without the harmonic complexity of chord progressions."[108]

A second characteristic feature of modal jazz is the use of a seven-note diatonic scale as the principal source for composition, accompaniment, and improvisation.[109] As jazz musicians drew stronger conceptual links between chords and scales, they started to

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[104] Burbat, *Jazz Harmony*, 60.

[105] Pianist Bill Evans worked with George Russell in the mid-'50s, at which time he could have likely been exposed to Russell's concepts. Miles Davis later acknowledged the influence that Evans's knowledge of chord/scale relationships had on him (see Waters, "Modal Jazz," 53). The two analyses of Bill Evans's tunes included in the following chapter might be considered historically and technically as precursors to this style.

[106] Levine, *Jazz Theory*, 29.

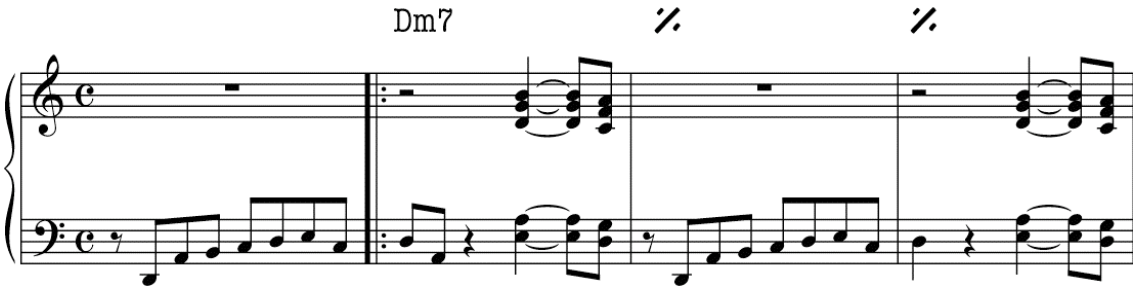
[107] See, for instance, Jaffe, *Jazz Theory*, 161-166; Burbat, *Jazz Harmony*, 60-65; Richard Lawn and Jeffrey Hellmer, *Jazz: Theory and Practice* (Alfred Publishing Co., Inc, 1996), 189-202; Bert Ligon, *Jazz Theory Resources: Tonal, Harmonic, Melodic, and Rhythmic Organization of Jazz* (Hal Leonard Corporation, Inc., 2001), 302-322.

[108] Lawn and Hellmer, *Jazz*, 195.

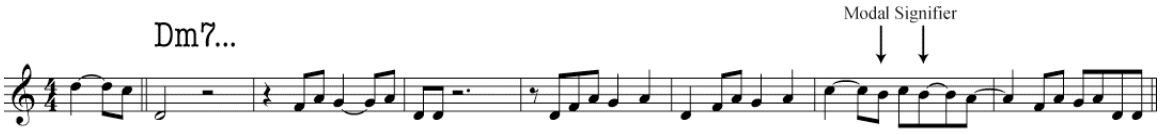
[109] This, of course, directly corresponds with chord/scale theory and Russell's theory.

use scales rather than chord series as their point of departure.[110] The opening of "So What" is presented in Example 2.25.[111] The lead sheet chord, Dmin7, is a subset of several modes. However, D Dorian is confirmed by the fact that the accompanimental chords (second half of mm. 1 and 3) comprise a complete white note collection.[112] Similarly, the opening measures of Davis's solo on this tune (Example 2.26) conspicuously includes B♮ in m. 6 to clarify that D Dorian (as opposed to D Aeolian, for instance, which would use B♭) is the point of departure. Summarizing such practice, Jaffe states that it is important to include the pitch class that distinguishes a given mode from others that share the same tonic.[113] In this case, the B♮ acts as the modal signifier.

Example 2.25: Miles Davis, "So What," mm. 1-3 (~0:33-0:41)



Example 2.26: Miles Davis, solo on "So What" (1:31-1:44)



[110] Burbat, *Jazz Harmony*, 60.

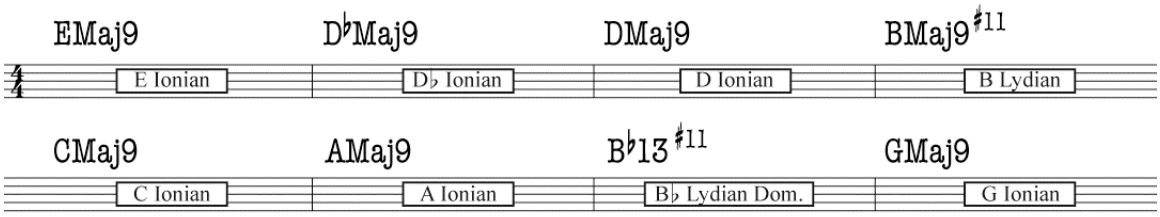
[111] Miles Davis, "So What," composed by Miles Davis, produced by Teo Macero (*Kind of Blue*, Columbia CS 8163, 1959).

[112] The allocation of D as tonic is supported by the melody and chord of the excerpt; the mode is confirmed by the pc content.

[113] Jaffe, *Jazz Theory*, 161.

A third characteristic often tied to modal jazz is the limited use—or even complete lack—of functional harmonic progressions. For instance, Example 2.27 shows the chord series used in the B Section of Joe Henderson's tune "Inner Urge" (*Inner Urge*, 1965), in which no two adjacent chords are generated by the same diatonic set. Further, the series, which is clearly based on a repeated <–3, +1> root progression, lacks the use of any traditionally functioning dominant harmonies. Instead, one might choose to understand each chord as being derived from a specific mode, as noted in boxes throughout the example, and improvise using any of the available notes in each corresponding mode, rather than limiting his/herself to chord tones.[114]

Example 2.27: Joe Henderson, "Inner Urge", B Section (mm. 17-24)



To some, the term "modal" is problematic in describing this repertoire, because soloists during this time often tended to use notes from outside of the mode for a given harmony. As noted by Henry Martin and Keith Waters,

> The term modal jazz often leads to confusion, however, because many of the qualities attributed to modal jazz do not necessarily have to do with the use of modes. In fact, as critics of the term point out, improvisers do not always restrict themselves to the pitches of the mode in their solos.[115]

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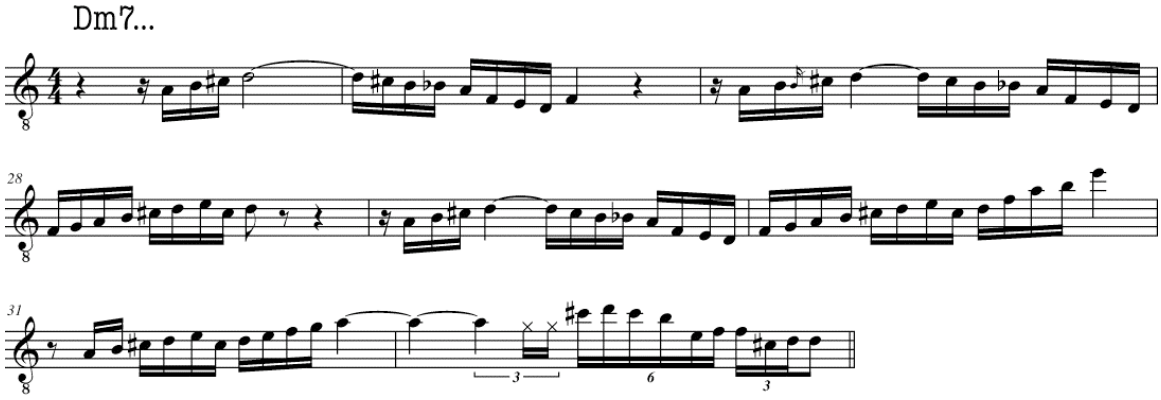
[114] This improvisational approach would represent an example of "vertical" playing. In the example, B♭ Lydian Dominant is the fourth mode of F melodic minor: <B♭, C, D, E, F, G, A♭>. This mode is sometimes referred to as the acoustic scale.

[115] Martin and Waters, *Jazz*, 261. Jason Titus acknowledges this problem as well, stating that describing "So What" "in terms of a strict Dorian modality is problematic for the simple reason that each performer uses a different array of pitches. This point becomes clear in the improvised solos of Davis, Coltrane, Adderley, and Evans. In each case, the

Such is the case in Example 2.28, for instance, taken from John Coltrane's solo on "So What."[116] Here, Coltrane raises $\hat{7}$ (C) in every instance that it immediately precedes and follows the tonic note, D. This altered note functions as a leading tone to D, and results in the collection <D, E, F, G, A, B, C♯>, or D melodic minor.[117] Whether one considers the lead sheet chord, Dmin7, as the underlying harmony for the passage, or the D Dorian mode as the guide for pitch-class selection, C♯ is in conflict. In fact, Coltrane completely avoids C♮ throughout the entirety of the eight-measure passage.[118]

Example 2.28: John Coltrane, solo on "So What" (~4:07-4:20)



Evidently, the freedom that modality gave to jazz inspired some musicians to think more about groups of notes and the ways that they can interact, and less about

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soloists play notes outside the Dorian collection, and there are many instances in "So What" in which a performer plays a chromatically altered scale degree in cross-relation with another who is using that scale degree's uninfected form." See Titus, "Miles Davis' "So What"," 13.

[116] John Coltrane, "So What," composed by Miles Davis, produced by Teo Macero (*Kind of Blue*, Columbia CS 8163, 1959). Transcription taken from Carl Coan, *John Coltrane: Solos* (Milwaukee, WI: Hal Leonard Corporation, 1995), 45.

[117] Jazz musicians commonly retain raised $\hat{7}$ when descending a melodic minor scale, sometimes referring to this scale as "jazz minor."

[118] B♭ is also used in the solo, as seen in the example. However, because of its metrical position (occurring on the fourth sixteenth note in each instance), this pitch is considered a chromatic passing tone between B♮ and A. Playing notes that are not a part of the scale governing a passage of music is sometimes referred to as "playing outside."

specific chords, keys, and function. Scales were considered more as referential collections rather than as specific ones to which an improviser must be restricted.[119] This is true of accompaniment as well as melody. So, while it might be understood that a given passage is governed by a particular mode, musicians took liberties in regards to how strictly they confined themselves to its members.[120]

REFERENTIAL SET THEORY: METHODOLOGY AND SAMPLE ANALYSIS

The concept behind referential set theory is one that I feel applies strongly to contemporary jazz writing and, in many ways, is a logical extension of both chord/scale theory and the practices of modal jazz. As was noted earlier, the basic premise of the theory is that specific melodic and harmonic events can be related to each other based on the pcs they share. This is also the idea behind chord/scale theory. My use of the term "set" rather than "scale" or "mode," however, is intended to signal how referential set theory generalizes previously established approaches. A referential set (abbreviated, at times, as RS) may be of any size, may be diatonic or non-diatonic, and may contain fewer than six or more than eight members, sizes that are rare in chord/scale theory.[121] In this respect, referential set theory also exhibits similarities with pc-set theory, more

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[119] For instance, in reference to Cannonball Adderley's solo on "Flamenco Sketches" (Miles Davis 1959), the lead sheet of which contains no chords and only a list of five modes, Samuel Barrett states how, "far from being confronted with an unusual demand to improvise simply on scales, it seems that Adderley was given a set of pitches that could be understood as familiar sonorities." See Samuel Barrett, "*Kind of Blue* and the Economy of Modal Jazz," *Popular Music* 25/2 (2006), 189.

[120] As Keith Waters notes, in reference to the tune "Flamenco Sketches," "beneath the D Phrygian section the pianist states D major and E♭ major triads, consistently using F♯ rather than the F♮ of D Phrygian." Waters, "Modal Jazz," 54.

[121] Of course, the pentatonic and blues scales are rather common in jazz playing. Further, the octatonic collection is common in chord/scale theory, and others have included the whole tone scale. See, for instance, Baker, *Jazz Improvisation*; Levine, *Jazz Theory*; Scott Reeves, *Creative Beginnings: An Introduction to Jazz Improvisation.* (New Jersey: Prentice Hall, 1997).

commonly used for the analysis of atonal works from the first half of the twentieth century.[122] In motivating the concept of the pc set, Allen Forte describes atonal music as being "characterized by the occurrence of pitches in novel combinations, as well as by the occurrence of familiar pitch combinations in unfamiliar environments."[123] In regards to the first characteristic, the tunes studied in this dissertation will, at times, include less-than-familiar chords: for instance, D♭Maj7$^{\sharp 9}$ supporting a melodic D♮. In regards to the second characteristic, the tunes will often include familiar jazz chords presented in unfamiliar sequences: for instance, Cmin9/F → B♭Maj7$^{\sharp 11}$ → E♭min9/A♭ → AMaj7$^{\sharp 11}$. Also, by not referring specifically to chords, the term "referential set" also signals a conception that is more focused on melody than is chord/scale theory.

By prioritizing the melody, referential set theory differs from many other analytical approaches to jazz tunes that assume that harmony provides the basis of jazz theory.[124] Often those approaches consider the harmony first (and sometimes exclusively), so that any mention of melody is often made in regards to how it relates to the harmony.[125] (This, as noted above, is consistent with the orientation of chord/scale theory.) However, because conflict often arises between the melody and its underlying harmony in contemporary jazz tunes, it seems reasonable to consider them separately, and I will often consider the melody first. Certainly, to construct and understand

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[122] Indeed, mode, as used in jazz, has been described as a type of pitch-class set; see Titus, "Miles Davis' 'So What'," 20. Steven Block uses set theoretical models to analyze free jazz works by Cecil Taylor and others. Keith Waters identifies pc-sets in the music of John Coltrane. See Steven Block, "Pitch-Class Transformation in Free Jazz." *Music Theory Spectrum* 12/2 (1990), 181-202, and Keith Waters, "Introducing Pitch-Class Sets in the Music of Coltrane and Harbison," *GAMUT* 9 (1999), 83–90.

[123] Allen Forte, *The Structure of Atonal Music* (New Haven and London: Yale University Press, 1973), 1.

[124] Martin, "Jazz Theory," 6.

[125] For instance, in her study of the music of Wayne Shorter, Patricia Julien considers melody "with particular regard for its participation in the harmonies and its role in directing the course of the harmonies." Julien, "Structural Function," 23.

improvisations, which are such a major component of jazz performance, one must eventually give considerable attention to lead-sheet chords. However, when those chords do not connect in traditional harmonic progressions, and when they make the identification of corresponding scales difficult, looking at the melody first will prove beneficial.

As I explained in regards to modal jazz works, analyses based on a tally of all the pc members in a tune are inadequate (or misleading) for identifying a single referential collection, since such tallies often include notes that conflict with any single mode. As I will show, the task of determining a referential set takes into consideration other musical factors, such as cadential gestures, bass line patterns, and melodic contour. Compiling all the pcs used in a musical passage is only one step in the process. Determining a referential set often begins with the identification of a single pc, most often in the melody, that commands attention through repetition, or phenomenal accent, or other factors that may vary from tune to tune. Often, the prominent pairing of this pc with the pc a perfect fifth above is determinative. Once identified, this pc becomes a point of reference of other pcs, either melodically or harmonically. Accordingly, I refer to this single referential pc as the "tonic" of a given passage of music. My early hearings of a passage are often guided by the referential tonic (abbreviated, at times, as RT), and it is around this tonic that the referential set is then subsequently assembled. Again, because the factors used to determine the tonic might vary from tune to tune, I will explain my decisions in each analysis.

We have seen an example of how in jazz standards, and in the improvisations over them, musicians tend to preserve a single collection across multiple changes. This is possible because the source tunes often dwell in a single key across phrases or even sections, and the chord scales are all consistent with that key, as a result of their modal orderings being rotations of the governing collection. In more recent tunes, though (such

as Henderson's, Example 2.27), the chord changes do not follow traditional tonal progressions; and applying chord/scale theory, while possible, seems impractical and inappropriate—impractical, because it may require a very different collection for each change, and inappropriate, because it precludes recognizing certain sorts of collectional continuities that the composers themselves may use (such as preserving a limited pc collection) when improvising on the changes. To demonstrate the applicability of referential set theory, this study will focus on compositions that, following from the practices set forth in modal jazz, suppress the use of standard functional progressions. For instance, they rarely use Mm7 chords, which are ubiquitous in the II7 → V7 → I functional progressions of more traditional styles. As a result, any functional progression found in these tunes will receive special attention since it will likely have a specific bearing on the identification of a referential tonic and its associated set.

Since the analytical method provides an interpretation of every event with reference to the referential set, it is important to understand how to determine what the referential set is. In making this determination, I will follow several heuristics, the validity of which will be demonstrated in the analyses that result. I list the heuristics together below, and then discuss each one.

1. For a given timespan, prefer to identify only a single referential set.
2. The referential set for a given timespan should include the pcs of most important events, and the most prevalent pcs, in the timespan. In particular, it includes the referential tonic.
3. The referential set should be chosen so that every pc that does not belong to it (in its timespan) can be understood as an alteration, by minimal interval (semitone), of a pc in the referential set.
4. The referential set should support the grouping structure of the tune (coextensive with phrases, sections, or complete works).

1. *For a given timespan, prefer to identify only a single referential set:* As much as possible, my analyses will prioritize a single referential set. Of course, I acknowledge the presence of multiple sets in the "polytonal" works of, for instance, Bartók, Milhaud, or Stravinsky, and can appreciate this as a compositional process. However, considering the repertoire studied in this dissertation, and based on personal experience shared with many musicians, I feel confident in claiming that most jazz musicians do not think of multiple sets at the same time. This is, at least partially, based on the improvisational nature of the style: even in a case of constant change, there is likely one set that is most prevalent in the improviser's mind, if only momentarily. Therefore, my analyses will show that a single collection will always assume the strongest presence.

Once a referential set has been identified, it is desirable to hear it extended as long as possible. There are practical reasons for this: the longer the set is heard to be around, the more time one has to become acquainted with it, making it easier to identify alterations and non-set members. Also, from a performer's perspective, passages that can be understood as accommodating a single referential set are easier to improvise on. Accordingly, shifting to a new set will only occur after explicit phrase boundaries, or in cases where excessive, and sustained, alterations suggests the establishment of a new set. Otherwise, retention of a single referential set will be preferred.

2. *The referential set for a given timespan should include the pcs of most important events, and the most prevalent pcs, in the timespan. In particular, it includes the referential tonic*: In mostly diatonic tonal music, the major or minor scale that corresponds to the key of the composition could be described as referential, in the sense that listening may be oriented by its continuous presence in both the melody and harmony. Generally the collection is signaled by the prominence and repetition of its most important scale degrees. Details of tension and resolution, melodic structure, harmonic syntax, and form may all be clarified by the way that they are understood to

relate to the underlying scale. In more chromatic repertoires, rapid circulation of pitch class may make these details harder to understand. Faced with such music, the listener who seeks orientation may still naturally gravitate towards emphasized or repeated tones, in the melody or harmony or both. The possibility of hearing pitch-class persistence as a form of continuity in apparently unruly chord successions is a strong motivation for developing the present theory.

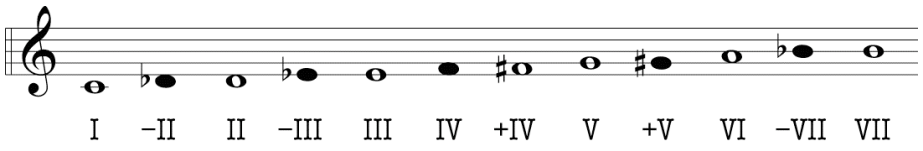
A note on determining the referential set: For players, conceptions of referential set and tonic will often derive from their conceptions of instruments. As a guitarist, for instance, I tend to orient myself around familiar, idiomatic patterns that include particular scale fingerings and/or chord shapes. My choice of which pattern to play (whether comping or soloing) for a given segment of the melody, especially when considering non-tonal works, is based on attaining a maximum correspondence between those pitches in that segment and those in the pattern, as well as a minimal motion in physical space to reach pitches that fall outside of the pattern. Most often, once I choose a pattern, I am conscious of where particular pitches reside within the pattern, principally the tonic (and its respective triadic members) and dominant (and its respective triadic members). Therefore, where and how I decide to place my hand on the fretboard reflects my understanding of a given tune, or musical passage.

3. *The referential set should be chosen so that every pc that does not belong to it (in its timespan) can be understood as an alteration, by minimal interval (semitone), of a pc in the referential set*: It is possible, and in fact likely, that a given passage will contain pcs other than those designated as referential. However, Heuristic 2 implies that they will not be important or prevalent. The choice of referential set is constrained by the desirability of interpreting these deemphasized non-set members as minimal perturbations of set members. Such an interpretation obtains if the members of the RS are chosen so that non-members of the referential set can be heard to relate to them by

semitone. When the referential set is chosen in this way, as the following analyses will demonstrate, non-set members can most easily be understood as ornaments, elaborations, or substitutions of set members, and so I will describe them as alterations within the referential set, and not as members of new sets. This conception enables me to describe every pitch in a given timespan as either a member of the referential set or as an alteration of a member.[126]

The idea of temporarily altering members of a referential set in order to obtain new pcs resonates with earlier jazz theory. For instance, Russell introduces his Lydian chromatic scale as a combination of the seven "parent scale" members interspersed with five "altered" members, as shown in Example 2.29.[127] Here, members are labeled using Roman numerals I-VII, with + or – signifying alterations of these members by plus or minus one semitone. Thus, Russell's chromatic theory retains the presence of a diatonic collection, but fills it in with chromatically altered members.

Example 2.29: Russell's representation of a Lydian chromatic scale



4. *The referential set should support the grouping structure of the tune (coextensive with phrases, sections, or complete works)*: Phrase boundaries are an important consideration in the assembly of a referential set. In traditional settings,

[126] Dmitry Tymoczko (jokingly) terms this the "Fundamental Theorem of Jazz," and states that, because improvisers of jazz often make use of scales that do not contain steps larger than 2 semitones, they can never be more than 1 semitone away from a member of their chosen scale. As a result, any "wrong" note can be analyzed as a chromatic neighbor to an adjacent member of the scale. See Tymoczko, *A Geometry of Music*, 156-157.
[127] This could be compared to set theory, which uses integer notation for pcs (0-11), eliminating any sense of hierarchy.

beginnings and endings are the usual places that composers signal tonics and keys. Commonly, tonality is established with focal melodic pitches and functional harmonic progressions that lead to a cadence. As a result, it is also at these points that a listener orients a hearing of a passage in regards to tonality, consonance and dissonance, and formal structure. In more complex musical situations, such as those presented in this dissertation, where concepts such as tonality and consonance and dissonance are obscured, the significance of grouping structure is elevated since the listener can use it to decipher which musical events are more salient.

Of course, the choice of referential set may itself influence grouping decisions. For instance, the change from one referential set to another can be heard to signal a phrase boundary, especially when other structural cues are not evident.[128] However, because a variety of factors must be considered in order to determine a referential set, this cue would be realized retrospectively.

The heuristics presented thus far are close to those that could be presented in analyzing tonal music. Certainly, in developing my theory from the perspective of the performer and improviser, the influence of tonality is undeniable. Therefore, I feel obligated to add two more heuristics to the list:

5. The referential set should preferably include a clearly articulated tertian collection whose root is the referential tonic.
6. Wherever possible, the referential set should be a diatonic collection (the "white key" collection or any of its transpositions and rotations).

5. *The referential set should preferably include a clearly articulated tertian collection whose root is the referential tonic*: Despite being presented in unfamiliar

[128] This will be the case in the analyses of "Kind Folk", "Labyrinth", and "Von Joshua", below.

successions, traditional chord types abound in contemporary jazz. These include MM7, mm7, and (more rarely in contemporary writing) Mm7, both with and without extensions, alterations, and omissions. The continued use of these chords reflects the ongoing significance of improvisation in jazz, and the influence of chord/scale theory. These tertian chords not only play a role within the pre-composed portions of a tune but, since each chord tends to have an associated scale, they also serve as vehicles for improvisation. Thus, the root of a given chord serves as the basis on which an improviser will build the corresponding scale.

6. *Wherever possible, the referential set should be a diatonic collection (the "white key" collection or any of its transpositions and rotations)*: The scales associated with the chord types listed in Heuristic 5 are primarily diatonic, and it is often only after chromatic extensions and alterations are introduced that chord/scale theory makes use of non-diatonic collections such as whole tone and octatonic scales. Of course, theorists have shown how other types of non-diatonic collections have made appearances in jazz tunes of the post-bop era. For instance, Waters and Williams refer to hexatonic collections in Wayne Shorter's harmonic writing, arrived at through chords that use sc [0148] as a subset.[129] Also, as stated above, Santa's and Yamaguchi's studies of Coltrane changes can support sets of limited transposition, such as the nonatonic collection.[130] Despite such observations, however, non-diatonic collections such as these are rare. Therefore, in consideration of the salience of tertian chord structures and their associated diatonic collections, diatonic collections will be the preferred referential set.

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[129] Waters and Williams, "Modeling Diatonic, Acoustic, Hexatonic, and Octatonic Harmonies."

[130] Santa, "Nonatonic Progressions," 13-25; Yamaguchi, "Multi-Tonic Changes," 147-167.

To clarify how referential sets are determined, as well as to bring out certain kinds of melodic processes, my analyses will often take a reductive approach. In essence, because a referential set obtains the uppermost hierarchical ranking in a musical passage, based on its melodic and harmonic presence, its manifestation in a specific pitch order can be thought of as a sort of *cantus firmus*, reminiscent of compositional practices in the fifteenth century. In describing those practices, Edgar Sparks defines a *structural cantus firmus* as one that "is laid out in a rigid pattern, and which serves as a skeleton or 'framework' upon which a composition can be erected."[131] Composers would embellish these skeletons in various ways. Because their source was non-measured, the structural tones were often spaced irregularly across a passage. According to Sparks, the tones of the cantus firmus could be presented in quick succession, or interspersed with several new notes.[132] "The number of notes added to the [cantus firmus] is, however, a matter of the discretion of the composer."[133] Example 2.30 is an excerpt from Binchois's *Sanctus*, and is reproduced from Sparks's Example 23.[134] The original cantus firmus is shown in the upper system, and the lower one contains the embellished version; the corresponding notes are highlighted with asterisks in the lower system. In this example, the first six measures contains two notes from the original cantus, yet the significance of these notes is assured by their temporal position within the phrase, as well as their longer metrical values. This is similarly the case in the second phrase.

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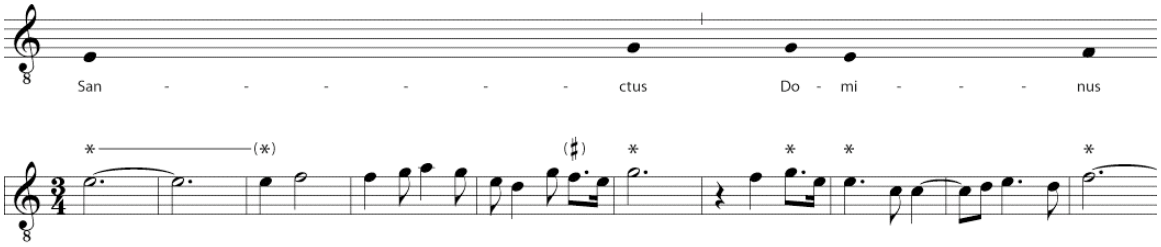
[131] Edgar Sparks, *Cantus Firmus In Mass and Motet: 1420-1520* (Berkeley and Los Angeles: University of California Press, 1963), 42.
[132] Ibid, 46.
[133] Ibid, 55.
[134] Sparks, *Cantus Firmus*, 56.

Example 2.30: An embellished *cantus firmus*



Though I do not wish to claim that referential sets derive from previously composed sources, they *can* be considered as the basis for skeletons on which a musical passage may be draped. This is reminiscent of Felix Salzer's concept of structure in tonal works, in which our understanding of the "structural framework" of a piece of music results from our ability to distinguish between structural events and prolongational ones.[135] Perhaps even more relevant here, though, is the work of those theorists who have attempted to identify points of structure in music that is not tonal—at least not in regards to a traditional conception of tonality.[136] In order to determine which pitch events are structural within a given piece, it is necessary to organize all such events hierarchically. Indeed, given the chromatic nature of some recent writing, as well as the limited use of "tonal cues," this is not always an easy task.[137] According to Roy Travis, depending on the length and complexity of the phrase, section, or tune being considered, "it may be necessary to establish a hierarchy of a half-dozen or more structural levels in order to describe with precision the role of any given chord or tone within the over-all [sic]

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[135] Felix Salzer, *Structural Hearing: Tonal Coherence in Music* (New York: Dover Publications, 1982).

[136] See, for instance, Roy Travis, "Towards a New Concept of Tonality?," *Journal of Music Theory* 3/2 (1959), 257-284; Robert Morgan, "Dissonant Prolongation: Theoretical and Compositional Precedents," *Journal of Music Theory* 20/1 (1976), 49-91; Joseph Straus, "The Problem of Prolongation in Post-Tonal Music," *Journal of Music Theory* 31/1 (1987), 1-21.

[137] When attempting to decipher the level of tonality in a given work, Henry Martin lists a number of common practices, which he describes as "cues." See Martin, "Seven Steps to Heaven: A Species Approach to Twentieth-Century Analysis and Composition," *Perspectives of New Music* 38/1 (2000), 132.

musical motion."[138] It is for this reason that I describe the "determination" of a referential set, and not the "identification" of one. Throughout the course of my analyses, I *determine* referential sets from pcs that are prevalent or important, as confirmed by various analytical observations. Nowhere in my analyses do I *identify* a referential set, and suggest that the set is something that might have existed prior to the conception of the tune being studied. In this regard, I consider referential sets, and their corresponding tonics, to be implicit characteristics of a given phrase, section, or tune.

In his discussion of the *Lydian Chromatic Concept*, Jason Titus remarks how Russell's theory "implicitly outlines a theory of structural levels."[139] The individual chords, reflected in "vertical polymodality," represent the foreground level; "tonic stations," reflected in "horizontal polymodality," represent the middleground; the Lydian chromatic scale, itself, represents the background. This is similarly the case here, with one important distinction: it will not necessarily be the case that a single referential set governs an entire tune at the background level. Though it may be analytically appealing (as described in regards to Heuristic 1), I do not assume that a single such set must exist for any given tune.

Recall, also, that Russell considers scales to be linear expressions of particular chords.[140] An important distinction, therefore, is that in referential set theory chords are analyzed as vertical expressions of referential set members, regardless of whether or not they are conceived of as traditional, tertian structures, or if they contain altered notes. Following this, any melody or chord can be representative of the referential set if its pc members are a part of the set that has been designated referential. I will refer to this as the *concept of inclusion*.

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[138] Travis, "Towards a New Concept," 261.
[139] Titus, "Miles Davis' 'So What'," 106.
[140] Ibid, 101.

Further, because referential set members extend to both the melodic and harmonic dimensions concurrently, the importance of a pc, and thus its membership in a referential set, does not necessarily derive from harmonic or contrapuntal support. Of course, the synchronization of a structural melodic note with a (highly) referential harmony—a harmonic event that is comprised exclusively of referential set members—will help to make the referential set more explicit. However, this is not necessary: an important melodic pitch may be accompanied by an "altered" harmony, and a referential harmony may support an alteration of a referential set member. Throughout this dissertation, I will use the adjective "structural" to denote those pitches that contribute most significantly to the determination of the referential set through prominence, as well as a combination of musical characteristics, including duration, contour, and temporal positioning.

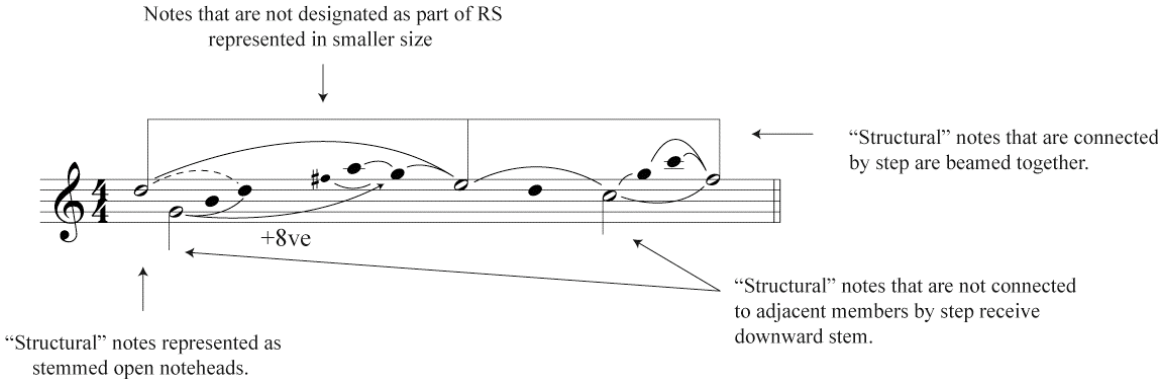
ANALYTICAL NOTATION

In my analyses, structural members of the referential set will be represented as stemmed open noteheads, while closed noteheads will represent referential members that are non-structural. As a representative example, consider Example 2.31, which represents the analysis of an excerpt from a tune by jazz guitarist Adam Rogers, which will be studied at length in Chapter 5.[141] I hear this excerpt as supporting G Mixolydian. Thus, members of this collection that contribute to my hearing, and are therefore considered structural, are represented with open noteheads: D_5, G_4, E_5, C_5, F_5. When my analyses include structural members that are connected via stepwise motion, these will be considered explicit statements of the scalewise ordering of the referential set (or portion thereof), and

[141] Adam Rogers, "Labyrinth," composed by Adam Rogers, produced by Gerry Teekens (*Apparitions*, Criss Cross Jazz B0007Y09KU, 2005).

will, therefore, be beamed together.[142] Accordingly, D_5, E_5, and F_5 are beamed together in Example 2.31. Thus a beam asserts continuity within the referential set (and does not necessarily signify a Schenkerian linear progression). Of course, it is also possible, as was the case in Example 2.30, that the structural members of the referential set be spaced irregularly across a passage. In cases where an intervening structural member temporarily interrupts an otherwise stepwise connection, the beam will be retained and the intervening member will receive a downward-facing stem. This applies to G_4 and C_5 in Example 2.31. Where necessary, slurs will be used to depict aspects of voice leading in a passage; these will be described more fully in each case. Altered members will also be represented using closed noteheads, but these will be smaller in size than those that are not altered.

Example 2.31: An annotated analysis of a structural melody in G Mixolydian



Despite the comparison made earlier to atonal set theory, referential set theory will not use integer notation. I will represent a referential tonic using square brackets around the corresponding pc name. For example, RT[G] means that I hear the referential tonic as G. Similarly, a referential set will be represented using square brackets around

[142] This follows from the idea that, for example, even though <F, A, G, C, D, B, E> can occur in D Dorian, <D, E, F, G, A, B, C> makes it more explicit, while not ruling out other white-note modes.

the referential tonic of the set, accompanied by the integer that corresponds to the traditional modal ordering (where 1 = Ionian, 2 = Dorian, 3 = Phrygian, 4 = Lydian, etc.). Thus, RS[G5] would represent G Mixolydian.

In the following analyses, the concept of octave equivalence may be applied. In the discussion of voice leading presented earlier, an example from Strunk (2003) was given (see Example 2.3). Because the chord voicings in the example do not necessarily reflect the actual voicings used in performance, it can be assumed that the analyst was conceiving of all chord members in pitch-class, not pitch, space. For the voices above the bass, this seems consistent with the usual chord notation of jazz tunes on lead sheets, which leave specific chord voicings up to the players. However, because I consider chords to be partially-ordered sets, where the bass note is below the other chord members (and certain voicings are much more likely than others), I will almost always restrict voice leading analyses to pitch space.

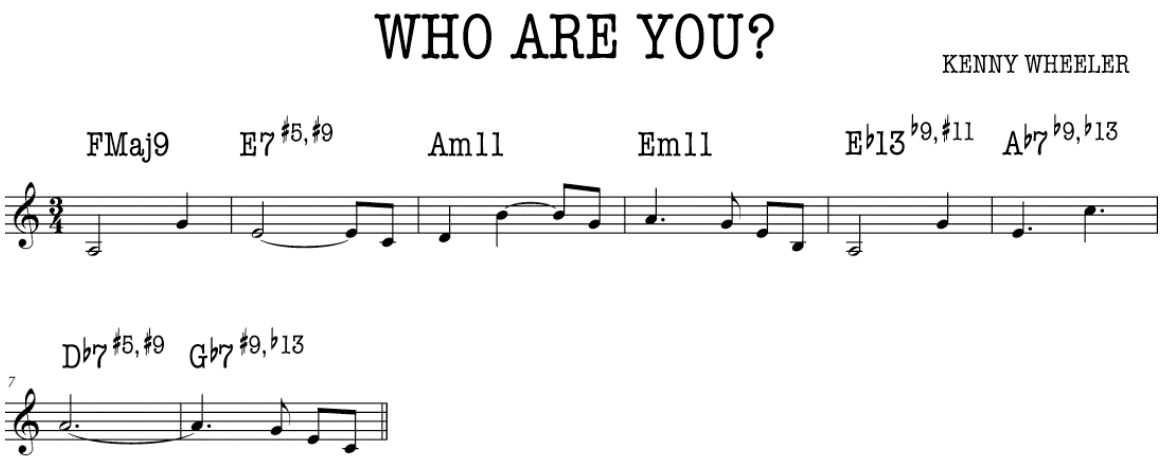
AN EXAMPLE OF DETERMINING A REFERENTIAL SET

Example 2.32 shows the melody of the opening eight measures of the tune "Who Are You?," composed by Canadian-born trumpeter Kenny Wheeler (this tune will be analyzed in its entirety in the following chapter).[143] The melody in these measures is primarily disjunct. However, in the absence of explicit linear continuity, certain durational accents focus my hearing and prioritize particular pitches. For instance, the durational accent on E_4 in m. 2 signals this note's significance, which I hear as related to A_3 that opens the tune. Also, because I hear the notes $<G_4, E_4, B_3>$ at the end of m. 4 as a

[143] Azimuth, "Who Are You?," composed by Kenny Wheeler and Jane White, produced by Manfred Eicher (*Azimuth '85*, ECM Records ECM 1298, 1985). The transcriptions included here, as well as those in Chapter 3, are transcribed from a hand-written copy made by Wheeler.

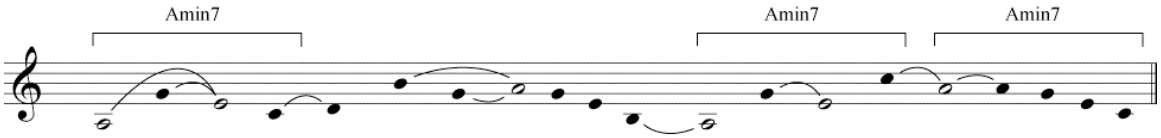
pick-up to the proceeding measure, I can understand A_4 as being sustained across the entirety of m. 4. Thus, the melody in mm. 1-4 places particular significance on pc A, as well as its fifth, E, suggesting the possibility of A as referential tonic (Heuristic 2).

Example 2.32: The opening melody in Wheeler's "Who Are You?" (mm. 1-8)



As will be described in the next chapter, a significant portion of the A Section's melody can be organized around a recurring series of pitches with limited octave variation. Example 2.33 presents a melodic reduction of the tune's first eight measures, with structural pitches represented using open noteheads. It shows that the series <A_3 (A_4), G_4, E_4, C_4 (C_5)> is repeated three times within these opening eight measures. The series members outline an Amin7 chord, the recurrence of which suggests it as a referential sonority and provides further support for A as referential tonic. Conceiving of this series as a single chord enables me to understand much of the leaping that occurs in the melody to be the result of chordal skips—moving from one chord tone to another.

Example 2.33: Structural melody of mm. 1-8 in "Who Are You?"

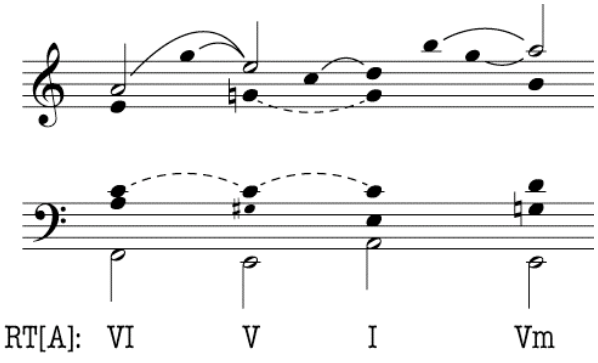


The melody in "Who Are You?" is, in fact, based entirely on a single diatonic (white-key) collection. Therefore, in adhering to the heuristics outlined above—especially Heuristic 6, which prefers diatonic collections—we could posit A Aeolian, or RS[A6], as a referential set for the tune. This set also supports the grouping structure of the tune (Heuristic 4), since mm. 1-8 clearly articulate a complete phrase.

In the next stage of our analysis, we seek to understand how the lead-sheet chords support or modify the impression of a referential set given by the melody. Example 2.34 shows the chord series used in mm. 1-4, and Example 2.35 presents a possible realization; for a clearer representation, the melody in Example 2.35 has been transposed up one octave. The Roman numerals included in Example 2.35 suggest a preference for RT[A]. Though the chord in m. 2 appears to be extensively altered, the example shows that $E7^{\sharp5,\sharp9}$ only contains one pitch that is not a part of the white-key collection: G♯.[144] In this regard, we can understand the alterations in m. 2's chord to be made in support of the overarching referential set.

Example 2.34: Chord series used in mm. 1-4

Example 2.35: Harmonization of melody, supporting RT[A] (mm. 1-4)

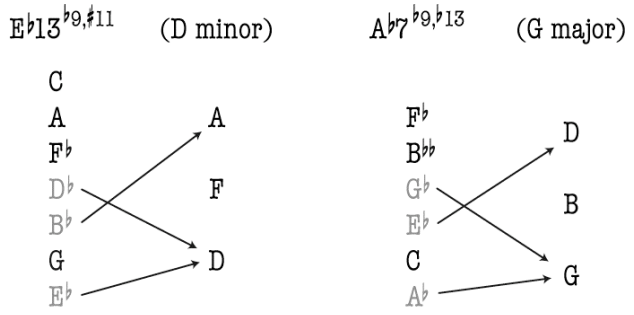


[144] $E7^{\sharp5,\sharp9}$ = <E, G♯, B♯, D, F♯♯> = <**E**, G♯, **C**, D, **G♮**>. As we will see, Wheeler often likes to sustain two or three pcs across chord progressions.

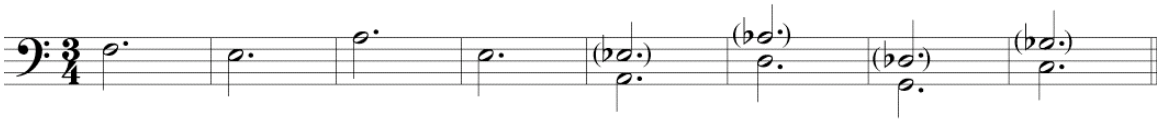
The measures that immediately follow present chords that are not obviously related to RS[A6]. But they may be reconciled with it by considering two procedures that are characteristic of jazz writing: harmonic sequence by descending fifth, and tritone substitution. The chords used in mm. 5-8 can be heard as tritone substitutions for secondary dominants of white-key triads: E♭7$^{♭9,♯11}$ substitutes for V7 of D minor; A♭7$^{♭9,♭13}$ substitutes for V7 of G major; D♭7$^{♯5,♯9}$ substitutes for V7 of C major; G♭7$^{♯9,♭13}$ substitutes for V7 of F major. In adhering to Heuristic 3 (the referential set should be chosen so that every pc that does not belong to it can be understood as an alteration, by minimal interval, of a pc in the referential set), it is possible to understand the pc members of each of these substitute chords as altered members of the RS-chords that are being tonicized. The first two of these chords are shown in Example 2.36, with non-RS members represented in grey. In the example, the roots of the tritone-substitutes (E♭ and A♭, respectively), as well as their respective sevenths (D♭ and G♭, respectively), are semitone displacements of the RS-members to which they would traditionally resolve.[145] This is similarly the case with the fifths of the tritone-substitutes.[146] Further, the substitutions allow me to understand the bass line in the first eight measures of "Who Are You?" to be derived exclusively from members of RS[A6], as shown in Example 2.37; in the examples, the actual bass notes in mm. 5-8 are given in parentheses.

[145] The sevenths are the enharmonically respelled leading tones of the following chords.
[146] In a case where the actual Mm7 chords were not replaced by their tritone substitutes, B♭ and G♭ are altered ninths, which resolve to the fifths of D minor and G major, respectively. Other resolutions would also occur between these chords, such as the third of each tritone substitute progressing to the third of the RS-chords. However, because these are all members of the governing RS, their presence need not be addressed in these particular cases.

Example 2.36: Members of tritone subs as alterations of RS-members

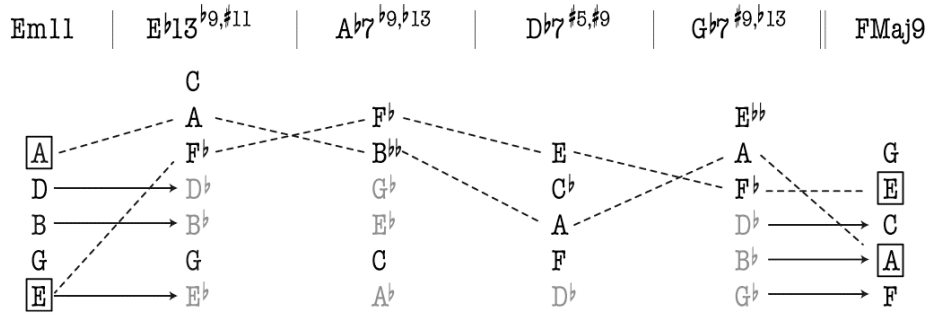


Example 2.37: Bass line in mm. 1-8 as derived from RS[A6]



Along with the root succession, the alterations specified to the lead-sheet chords in mm. 5-8 also strongly support the sense of a single, persistent referential set, and focus on RT[A]. Example 2.38 shows the pc-content of the series of Mm7 chords across these four bars, and also includes the chords that immediately precede and follow them (Emin11 and FMaj9, respectively). Though the alterations vary from chord to chord, they mostly specify the same two pcs, A and E—the tonic and fifth of A minor. (The only exception is in m. 8, where ♭13 over G♭ = D♮; in that same chord E (or F♭) appears as an unaltered chord tone and A appears as ♯9 over G♭ = A♮). These pcs are highlighted in the example by the broken lines that connect them from chord to chord. The constant presence of these notes across a highly chromatic passage, in which the alterations superficially appear inconsistent with a single referential set, provides a significant sense of continuity. Therefore, in adhering to Heuristic 1 (for a given timespan, prefer to identify only a single referential set), my analytical goal is to suggest interpretations that are most feasible based on a variety of factors, propagating relationships that can extend beyond one chord at a time.

Example 2.38: Pitch-class content of chord series used in mm. 4-9



This brief demonstration indicates how referential set theory can promote understanding of contemporary practices in jazz composition and improvisation. As I hope to demonstrate with the analyses ahead, this theory is more flexible than its predecessors in that it combines elements of traditional jazz theory with techniques reminiscent of those used in the analysis of nineteenth-century chromaticism. Further, referential set theory is more encompassing than previous approaches since it can more easily accommodate sets other than cardinality seven and, more notably, it permits, and even encourages, the retention of a single referential set through seemingly unrelated harmonic moments of a tune by chromatically altering pcs within that set that do not, otherwise, change the perception of an overarching referential tonic. In this regard, it is possible to identify and describe deviations from a given referential set as they relate to the underlying harmony while retaining a global sense of tonic, resulting in a more holistic understanding of the tune that is being considered.

As much as possible, the following analyses will refer to transcribed improvisations made from recordings of the tunes being considered (as was done in my analysis of "All the Things You Are"). Where relevant, I will use the transcriptions as a resource to inform my own analytical observations. As a practicing musician, I believe that approaching tunes such as these from the perspective offered by referential set theory can result in a more economical way to improvise. More specifically, referential set theory enables me to retain particular sets of pcs across extended musical passages that

otherwise may seem unrelated. Of utmost importance to me, as both a theorist and a performer, referential set theory attempts to draw from those concepts that are fundamental to both the analysis *and* the performance of jazz tunes—thus encompassing both types of jazz theory outlined by Martin.

CHAPTER 3

POST-BOP, MODAL JAZZ, AND THE APPLICATION OF REFERENTIAL SET THEORY

Many post-bop tunes feature non-diatonic chord successions that seem to lack harmonic continuity. These tunes often encourage a chord/scale approach to realizing and improvising on them, in effect asking the player to concentrate on what notes to play on each change, rather than on continuities across multiple changes. Indeed, analyses of such chord successions often focus simply on identifying a scale for each chord, not on keys or harmonic progression.[147] This chapter begins by considering a tune that predates post-bop jazz, but whose chord succession is nevertheless representative of those used in post-bop jazz, in the sense that traditionally functional chord progressions are present, but apparent shifts to different tonal centers occur rapidly within a short time span. In the second example, chord-to-chord functionality is absent, but I will develop a way of conceptualizing the music that demonstrates coherence over segments from eight to sixteen measures in length. Finally, a third example will present a complete, thirty-two-measure tune. In each case, the objective will be to show how referential set theory's flexible and eclectic approach can be applied analytically to passages of increasing scope, relating both melody and chords to a single tonic and pitch-class collection, and thereby identifying continuities that a simple chord/scale approach might miss.

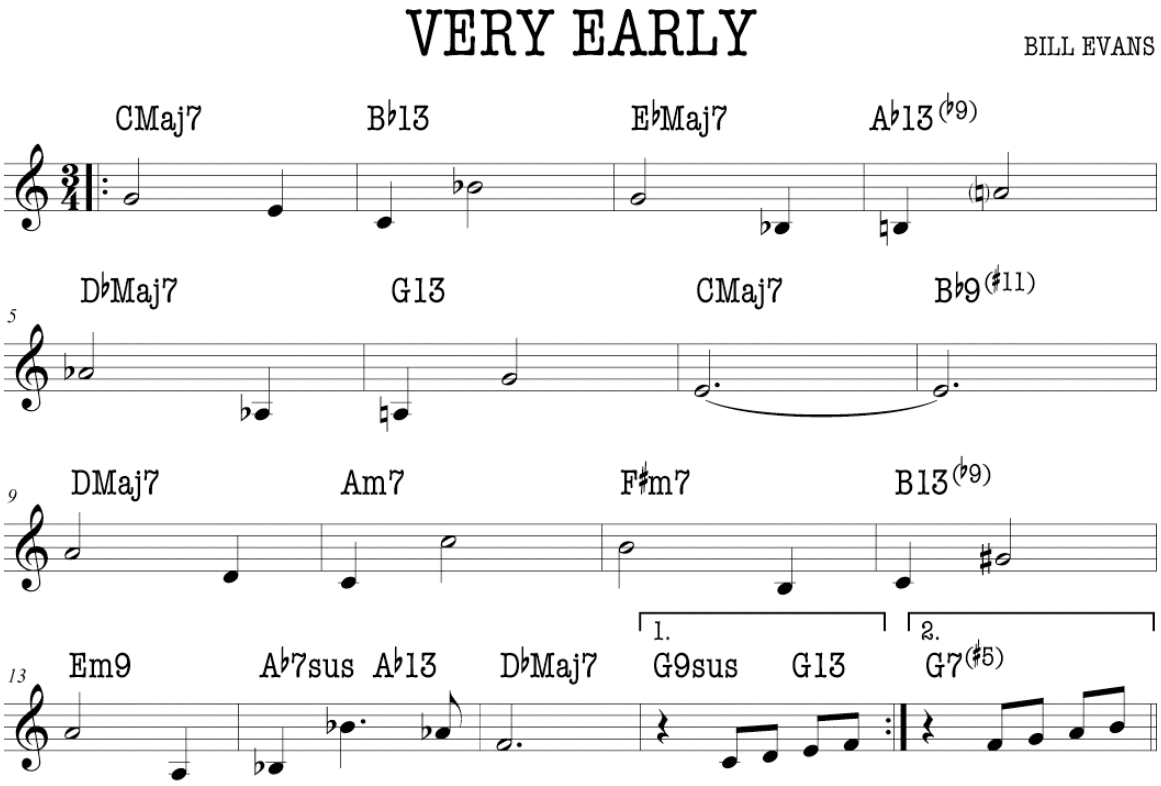
[147] See, for instance, Daniel Arthurs's Example 4.7, which includes a chord/scale analysis of the tune "Unrequited," (1998 Brad Mehldau), in "Reconstructing Tonal Principles in the Music of Brad Mehldau" (Ph.D. diss., Jacobs School of Music, Indiana University 2011), 115-116.

POST-BOP JAZZ AND THE SUPPRESSION OF FUNCTION

Example 3.1 shows a lead sheet for the first sixteen measures of "Very Early," originally included on the Evans album *Moonbeams*, released in 1962.[148] Consistent with a lot of post-bop writing, we can see that many of the adjacently related chords are not diatonic, in the sense that all the notes in one chord do not belong to the same diatonic collection as those in the next. In many tonal jazz tunes, such as "All the Things You Are" (discussed in the previous chapter), in which many successive chords do belong to a single diatonic collection, improvisations on the changes can be horizontal in conception, where a single scale can be retained when improvising over many bars. The changes in much of "Very Early," on the other hand, seem to demand a vertical approach, since, as already mentioned, the pc content in many of the chords belongs to different scales. This is not to say that "Very Early" is not tonal; only that, by changing keys so quickly, it can provide an improvisational challenge. As will be shown in the discussion that follows, though an approach such as that outlined in referential set theory may not be required to explain this tune, it can suggest some very productive improvisation strategies, and will help the reader grasp its heuristics in preparation for the following analyses.

[148] Bill Evans, "Very Early," composed by Bill Evans, produced by Orrin Keepnews (*Moonbeams*, Riverside Records OJCCD 434-2, 1962). Lead sheet transcribed from *Bill Evans Fakebook*, 2nd ed., transcribed and edited by Pascal Wetzel (New York: Ludlow Music, Inc., 2003), 89. It is known that Evans actually composed this tune sometime between 1946-50, while in school, and so it in fact predates the post-bop jazz era. Despite this, its chord succession is highly anticipative of post-bop writing. Also, it is specifically while improvising on this tune that I began thinking about many of the issues that referential set theory attempts to address.

Example 3.1: Bill Evans's "Very Early" (mm. 1-16)



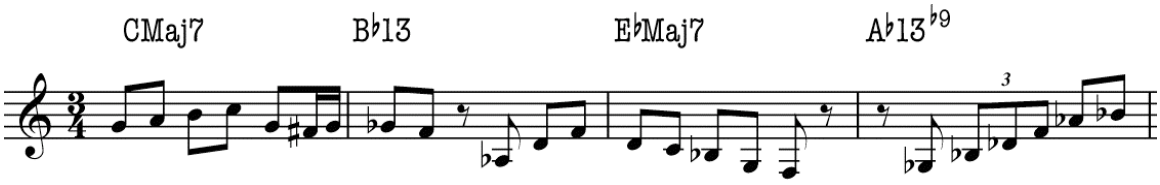
Example 3.2 shows an excerpt from an improvisation by guitarist Kurt Rosenwinkel on mm. 1-4 of "Very Early."[149] A basic analysis of Rosenwinkel's solo, shown in Example 3.3, shows how one player handles the challenge of improvising in this situation: he seems to move from C Ionian to B♭ Mixolydian to E♭ Ionian to A♭ Mixolydian.[150] In each measure, every note can be understood as belonging to the corresponding scale in this analysis, with two exceptions (F♯$_4$ in m. 1, analyzed as a

[149] Kurt Rosenwinkel, "Very Early," composed by Bill Evans, produced by Jakob Dinesen (*Around,* Stunt 616953, 2001).

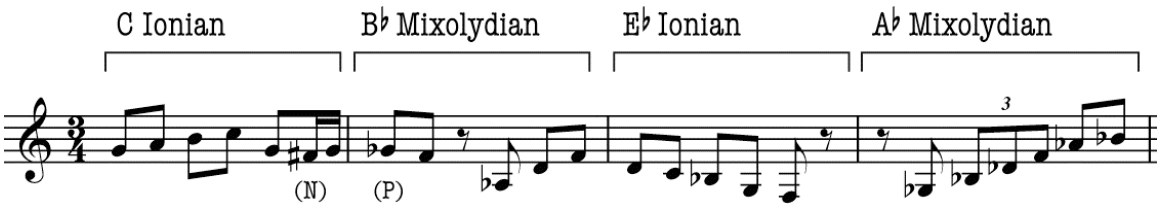
[150] This analysis is, admittedly, somewhat simplistic. A more literal analysis of the excerpt might deduce C Lydian in m. 1 on account of the F♯$_4$; also, A♭ Mixolydian discounts the ♭9 in the chord symbol, though it does support ♮9 (B♭), which Rosenwinkel plays twice in the measure.

chromatic neighbor (N) to G_4, and $G\flat_4$ in m. 2, analyzed as a chromatic passing tone (P) between G_4 and F_4).[151] It would seem, therefore, that Rosenwinkel is adhering quite literally to the underlying chord changes in his improvisation, as chord/scale theory directs.

Example 3.2: Kurt Rosenwinkel solo on "Very Early" (mm. 1-4, ~1:11-1:15)



Example 3.3: Chord/scale analysis of Rosenwinkel's solo on "Very Early" (mm. 1-4)



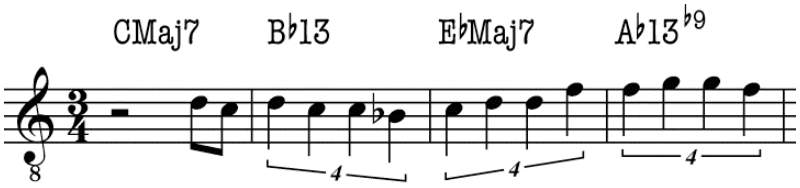
Other soloists, however, do not change scales so rapidly. Example 3.4 shows an improvisation by tenor saxophonist Jakob Dinesen over the same opening four measures of "Very Early."[152] The scales Rosenwinkel uses are not apparent in Dinesen's

[151] These notes are enharmonically equivalent, so it seems possible that Rosenwinkel was just embellishing the more stable G_4 (m. 1) and F_4 (m. 2) with chromatically altered notes, rather than conceiving of them as the ♯11 and ♭13 of the respective underlying chords. It is also possible to extend some of the scales beyond their respective measures. For instance, C Ionian can continue into the first beat of m. 2, ending on F_4; B♭ Mixolydian and E♭ Ionian can account for the pitches in both mm. 2-3. Despite this, the majority of the notes used in Rosenwinkel's solo conform to a traditional chord/scale approach.

[152] Jakob Dinesen, "Very Early," composed by Bill Evans, produced by Jakob Dinesen (*Around,* Stunt 616953, 2001).

improvisation, most notably in m. 4, where Dinesen plays a G♮5 over A♭13♭9.[153] Indeed, we could analyze Dinesen's entire line as comprising a single scale, such as B♭ major-pentatonic. Such an interpretation could be taken to suggest that the soloist was simply ignoring the changes, raising the question of why this particular scale was chosen.[154] By the same token, however, it raises the question of whether or not a single collection *could* actually be consistent with all of the non-diatonically related chords in the excerpt, as proposed in referential set theory. If so, which set best suits the excerpt, and why? In an attempt to address questions such as these, we will consider "Very Early" in more detail.

Example 3.4: Jakob Dinesen, solo on "Very Early" (mm. 1-8, ~3:10-3:15)



The opening sixteen measures divide evenly into two eight-measure phrases, mm. 1-8 and mm. 9-16. Despite the aforementioned concerns regarding the tune's opening four measures, we can see that the opening chord, CMaj7, returns in m. 7, preceded by its dominant, G13. I hear mm. 1-8 as a closed phrase, resulting from the V → I cadence on the same chord as that which initiated the phrase, supporting a traditional grouping structure.[155] G13 returns in m. 16, at the first ending, and thus prepares the return of the

[153] Of the 12 possible notes that one could play over A♭13♭9, it is my opinion that G♮ would be the last choice, since this note would be inconsistent with both the notated quality and the implied function of the chord. It could be possible to play this note as a chromatically altered leading tone to the chordal root, A♭. However, this is not how Dinesen is using it, since G_5 returns to F_5 at the end of the measure.

[154] Since, for instance, B♭ major pentatonic would present a potential conflict with the seventh in both chords 1, CMaj7, and chord 4, A♭13♭9.

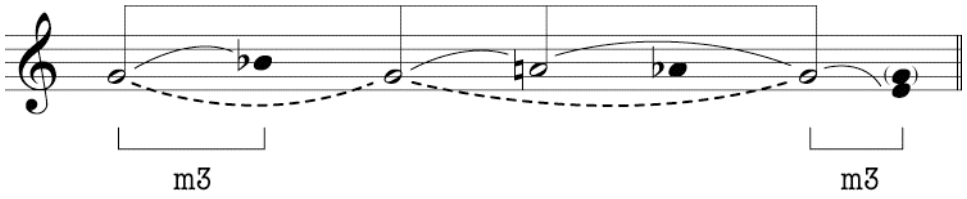
[155] In isolating the phrase, I imagine CMaj7 comprising both mm. 7-8, resulting in a closed phrase that begins and ends on the same chord. I, therefore, hear B♭9♯11 as a non-functional contrapuntal chord that connects the end of Phrase 1 to the beginning of Phrase 2. The E♮ that is sustained into m. 8, which, following chord/scale theory suggests a

opening chord, CMaj7. Therefore, a particular type of harmonic consistency can immediately be perceived across mm. 1-16, in which the tune's opening chord is not only emphasized as a result of being preceded by its dominant at a later moment, but it is also prioritized as a result of its position within the section, at the beginnings and ends of phrases. So, despite the seemingly non-diatonic nature of the progression overall, C takes precedence over all other possible "tonics," and supports the grouping structure of the tune (Heuristic 4). Accordingly, a preliminary analysis of the harmony in "Very Early" supports RT[C]. But before considering C's relationship to the remaining chords in these measures, let us consider whether or not it is supported in the tune's melody.

Because of its contour and rhythmic organization, I hear a compound melody in the opening sixteen measures of "Very Early." At first, two higher long notes are separated by two lower short notes, which results in my hearing the long notes as an upper-voice part. The melodic structure of the upper voice across the first eight measures, as I perceive it, is shown in Example 3.5. The recurrence of G_4, which is heard as a long duration (𝅗𝅥) three times within these measures, helps me to prioritize this pitch over all others in the phrase's melody; the dashed slur in the example represents the prolongation of this pitch across the phrase. The example also shows how, following the step to A_4 (m. 4), which results in a momentary shift of melodic focus, the return to G_4 (m. 6) occurs through a passing $A♭_4$. I, therefore, understand A_4 to function as a structural neighbor to the more prominent G_4. G_4 then leaps down a minor third to E_4 to close the phrase; the prolongation of G, however, continues through the end of the phrase as a result of its membership in CMaj7 (and so parenthesized in the example). The melodic leap between G_4 and E_4 can be understood as mimicking the ascending minor-third leap, from G_4 → $B♭_4$, heard at the beginning of the phrase.

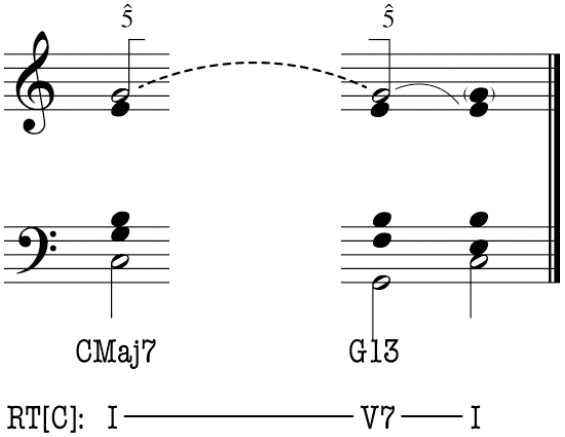
Lydian-dominant scale, <B♭, C, D, E, F, G, A♭>, helps support tonic prolongation across both measures.

Example 3.5: Melodic structure of upper voice in mm. 1-8 of "Very Early"



The melody and harmony work together to establish C as referential tonic throughout these measures. Since the chord that begins and ends the phrase is C major, and since G is, essentially, prolonged in the melody across the phrase, I hear these as $\hat{1}$ and $\hat{5}$ of C, respectively. Example 3.6 shows how C, along with its fifth, G, border the first phrase of "Very Early."

Example 3.6: C major bordering first phrase of "Very Early," supporting RT[C] (mm. 2-5 excluded)



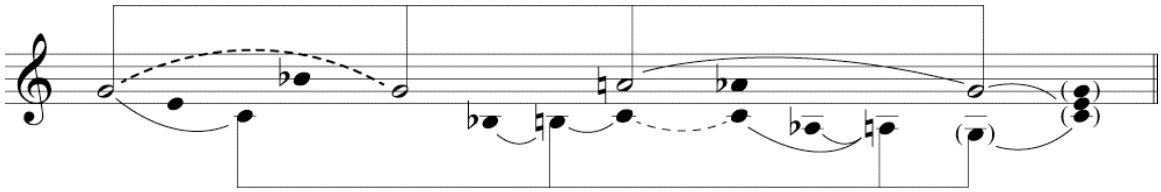
Despite some significant harmonic changes, chordal support for RT[C] eventually materializes in Phrase 2. The chord that opens the second phrase, DMaj7, sounds like a transposition of the tune's opening measure, especially since the first long note, A_4, which is the fifth above D, is connected to the second long note, C_5, by a minor third. A second similarity can be observed between Phrases 1 and 2, since some chord pairs that occupy the same positions in both phrases have similar root relations. For instance, the ascending-third relation between the first and third chords, DMaj and F♯min, might

remind us of the relationship between CMaj and E♭Maj in Phrase 1 (albeit one is a major third and the other is a minor third), and the descending major-second between the third and fifth chords, F♯min and Emin, reminds us of that between E♭Maj and D♭Maj. Despite these suggestions of transposition, however, the return of the D♭Maj7 → G13 chord series in mm. 15-16, which was heard in mm. 5-6 of Phrase 1, enables me to hear the entire A-Section of the tune as bordered by RT[C], despite the appearance of other fleeting tonalities across mm. 1-16.

Example 3.7 extends the analysis presented in Example 3.5 by including the lower voice suggested by the compound melody in Phrase 1. The example shows my hearing of this voice: a stepwise descent, from C_4 to A_3, which is then extended by way of an octave transfer to G_4. For clarity, the example stems the lower voice's descent from C_4 to the implied G_3—a line that gives additional emphasis to the root and fifth of C. I am prioritizing B_3 and A_3 over the notes that immediately precede them, $B♭_3$ and $A♭_3$, firstly to accommodate the single direction of the line, but also because these pitches demand attention on account of their stronger metrical position. Accordingly, $B♭_3$ and $A♭_3$ are analyzed as chromatic incomplete neighbors.[156] In the example, the lower voice's descending line is momentarily interrupted when B_3 "resolves" to the third of A♭13, C_4; this is subsequently held over to become the seventh of D♭Maj (represented by the broken line in the example). C_4 then leaps by minor third down to A_3 to resume the descent. The minor third leap then recurs, as previously noted, between G_4 and E_4 in the upper voice. The melody's opening foreground arpeggiation of C major, which connects to the aforementioned descending line, gives extra emphasis to this as a referential sonority.

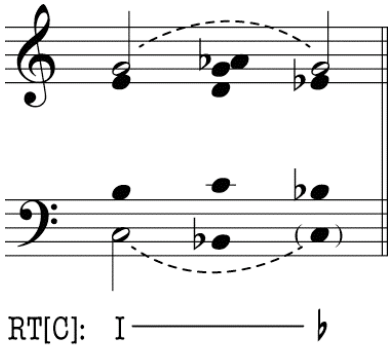
[156] The spelling of these notes are the result of the underlying chords, where, for instance, spelling $B♭_3$ as $A♯_3$ over E♭Maj7 would be awkward.

Example 3.7: Melodic structure of compound melody in mm. 1-8 of "Very Early"



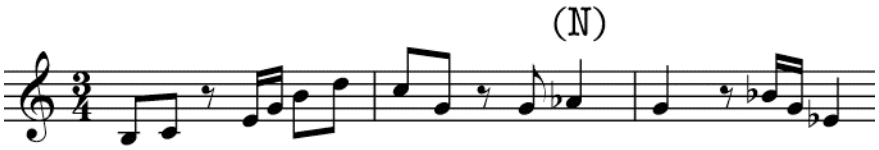
The prolongation of G_4 in the melody of the first three measures enables me to relate the underlying chords in a similar manner, and I can hear tonic sustained throughout mm. 1-3. Indeed, in my most basic understanding of these measures, which is represented in Example 3.8a, the first three measures of the tune support a prolongation of tonic harmony, from I → I♭, with E♭Maj7 acting as a rootless Cmin9; the shift of mode can be understood as mixture.[157] Consistent with this hearing, Evans's solo on these measures, shown in Example 3.8b, focuses strongly on the notes of the CMaj7 and Cmin7 chords, briefly embellishing the melody's structural G with an A♭ neighbor.

Example 3.8a: "Tonic" prolongation in mm. 1-3, plus mixture



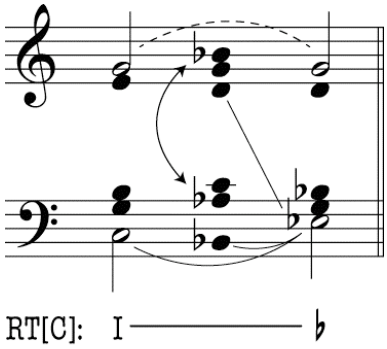
[157] The inclusion of C_3 in parentheses is to represent the prolongation of RT[C] across mm. 1-3, and does not imply its presence in the third chord. Progressions such as this, I → ♭VII → I, can be heard in tunes such as "Old Devil Moon" (B. Lane), which alternates between F7 and E♭7. Other tunes that make use of the progression ♭VII → I include "I Remember You" (V. Schertzinger; E♭7 → FMaj7 (mm. 6-7, 2nd ending)), "Stella by Starlight" (V. Young; A♭7$^{\sharp 11}$ → B♭Maj7 (mm. 8-9)), and "Song For My Father" (H. Silver; E♭7 → Fmin (mm. 7-12)).

Example 3.8b: Bill Evans, solo on "Very Early" (mm. 1-3, ~1:17-1:21)



Although Example 3.8a does not show the actual outer-voice counterpoint of the lead sheet, which is shown in Example 3.8c, it is a simple rearrangement of it. In comparing the two examples, we can see that the B♭ and A♭ have switched positions, so that $B♭_3$ (middle chord, Ex. 3.8a) has been transferred up an octave to $B♭_4$ to reflect the melody; $A♭_4$ (middle chord, Ex. 3.8a), which embellished the structural G, has been transferred down an octave to $A♭_3$; D_4 (middle chord, Ex. 3.8a), which progressed to $E♭_4$ in Example 3.8a, has been sustained across both chords 2 and 3, and $E♭_4$ has been transferred down one octave. What these examples attempt to show is that a single harmony is prolonged across the first three measures of the tune. This is consistent with the structural melody, which prolongs a single pitch in mm. 1-3, and confirms a single referential tonic, RT[C].

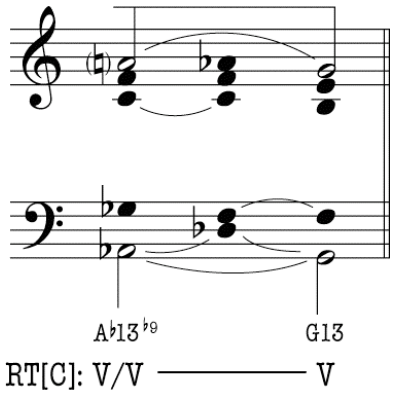
Example 3.8c: "Tonic" prolongation in mm. 1-3 using substitute chord



Prolongation, which is suggested in the melody, continues in the chords in the subsequent measures of Phrase 1. Earlier (Ex. 3.5), I described how the melody's overarching prolongation of G_4 is momentarily disrupted by the step up to A_4, which then returns to G_4 through a passing $A♭_4$. Preferring A♮ (m. 4) over A♭ (m. 5) in the present

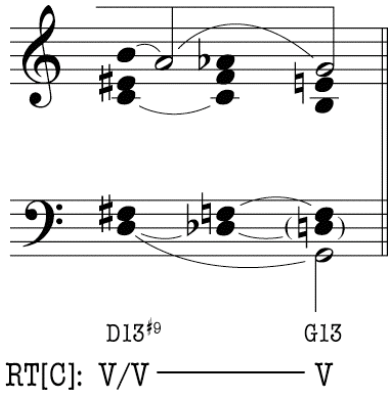
context is consistent with the phrase's structural melody, since I hear A♮ as a structural neighbor to G, and A♭ as a non-structural passing tone.[158] Since the structural melody connects m. 4 to m. 6, therefore, I can connect the underlying chords similarly. Example 3.9a represents my hearing of mm. 4-6. I analyze the chord in m. 4, A♭13$^{♭9}$, as a tritone substitute for a secondary dominant of G. This results in a chromatic descent in the bass, from ♭6 → 5, reminding me of an alternate, yet also traditionally tonal gesture. Example 3.9b replaces A♭13$^{♭9}$ with D13$^{♯9}$. Here, the voice leading between D13$^{♯9}$ and D♭Maj7 is exclusively parsimonious. Parsimony is also maintained between D♭Maj7 and G13 if we imagine the chordal fifth of the latter chord, D, in the bass (shown in parentheses in the example). As a result, I can understand D♭Maj7 as a subsidiary harmonic event that results from contrapuntal elaborations of adjacent chords. Though this hearing does not align with the grouping of the surface melody, it is consistent with that of mm. 1-3, and I understand the harmonic structure of the phrase to consist of a prolonged tonic chord followed by a prolonged dominant. Thus, the chords that I hear as most important, or most structural, are those that align with the structural melody's <G_4, G_4, A_4, G_4>.

Example 3.9a: "Dominant" prolongation in mm. 4-6 using tritone substitution



[158] Preferring A♮ over A♭ is also consistent with the descending line identified in the lower voice of the compound melody (see Ex. 3.7), despite the use of mixture in mm. 1-3.

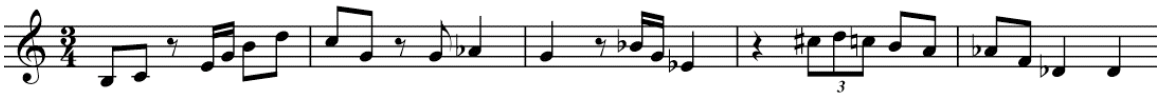
Example 3.9b: "Dominant" prolongation in mm. 4-6 using secondary dominant



Earlier, I asked whether or not a single collection could account for all of the chords in the opening of "Very Early." More specifically, could all the chords be subsumed under a single referential set that could provide the basis for improvising on them? It is relatively clear that traditional cadential gestures that coincide with structural phrase divisions prioritize particular pitches over others. This, in turn, supports the idea of a referential tonic, which, in this case, is C. However, chromaticism makes a single referential set somewhat difficult to determine. The quality of the tonic chord suggests a major-mode set, though the tonic prolongation in mm. 1-3 is achieved through modal mixture. The bass line in mm. 1-8 can also be analyzed as preferring C minor. Referential set theory favors identifying a single RS across a timespan (Heuristic 1) that supports the grouping structure of the tune (Heuristic 4). Therefore, switching sets within the first three measures is not ideal. Further, apart from m. 3, there is little evidence to support C minor as tonic harmony in the tune's first two phrases. Therefore, in consideration of the chord quality that opens and closes the phrase, as well as the additional support provided by the melodic analysis given above (Examples 3.5 and 3.7), I determine that the most suitable candidate for referential set be C Ionian, or RS[C1]. In so doing, I can make further claims regarding some of the chromaticism heard across Phrase 1. For instance, the melody in m. 4 uses the pitches $B\natural_3$ and $A\natural_4$—the ♯9 and ♭9 over A♭, respectively. Interpreting this measure within the context of a governing RS[C1] supports the idea that

the "altered" harmonic and melodic tones in m. 4 (the ♯9 and ♭9) aren't actually altered at all, but are distinct members of the referential set (as shown above), and, as a result, make the measure more consonant within the most prevalent tonal region of the phrase. This is further supported in Evans's improvisation over this measure, shown in Example 3.10, when he plays a D♮ in m. 4, as well as B♮ and an A♮, all of which support RS[C1] as referential set for the phrase.[159]

Example 3.10: Bill Evans, solo on "Very Early" (mm. 1-5, ~1:17-1:24)



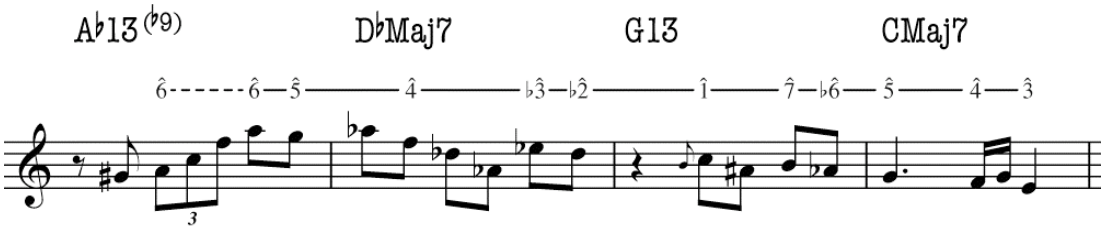
Interpreting the pitch structure in this way helps clarify an issue raised earlier. By accepting A♭13$^{♭9}$ as the tritone substitute for D7, and not as the dominant of D♭Maj7, we can better understand Jakob Dinesen's improvisational choice to play the note G in m. 4 (refer back to Ex. 3.3). Specifically, Dinesen's line can now be understood as moving from the raised ninth (F♮ = E♯), which is included in the D-rooted chord, to the eleventh (G). More generally, however, Dinesen's choice to play G♮ over a putative A♭ Mm7 chord works because this note is consistent with RS[C1].

Other improvisations on this tune also support the persistent presence of this RS across several changes. Example 3.11a is an excerpt from an improvisation by Bill Evans on "Very Early," taken from the fourth measure of the second chorus. The first measure in the example prioritizes A♮, an altered note when considering the underlying A♭13 chord, but an unaltered member of RS[C1]. From here, it is possible to identify a completely stepwise descent through this set, with altered members primarily serving to

[159] Because D_5 is followed immediately by C_5, it makes sense to analyze the note that precedes D as C♯, a chromatically altered incomplete neighbor, rather than D♭.

reflect the underlying chords. Also, the motion from C_5 to B_4 in the third measure of the example reminds me of a 4–3 motion, in which a chordal seventh is suspended over the bar and resolves to the third of the chord, supporting the possibility that G7 is being tonicized by its dominant.

Example 3.11a: Bill Evans, solo on "Very Early" (m. 20, ~1:43-1:48)



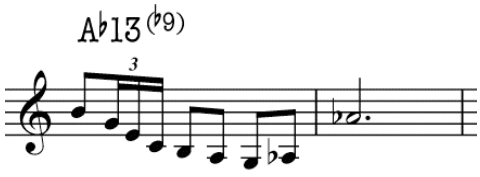
Examples 3.11b-c are excerpts from an improvisation by tenor-saxophonist Stan Getz on the same tune, taken from the album *Pure Getz*, released in 1982.[160] Like Jakob Dinesen (discussed in the opening of this chapter), Getz's particular choice of notes conflict with a traditional interpretation of the chord in m. 4 of "Very Early," but supports RS[C1]. It is quite striking how, as in Example 3.3, both Evans's and Getz's improvisations omit the chordal 7th, G♭, but include G♮.[161] It might be the case that, in Example 3.11a, Evans is using $G♮_5$ as a lower neighbor to $A♭_5$. But the clear presence of the stepwise line described above allows me to prefer F_5 as the more structural pitch, with $A♭_5$ functioning as an incomplete neighbor. The presence of G♮ in favor of G♭ diminishes the sense of a traditionally functional relationship that might be perceived in the progression, where the resolution of an A♭ chord in the key D♭ major would certainly be much more convincing with the seventh, G♭, resolving to the third, F. An example of this

[160] Stan Getz, "Very Early," composed by Bill Evans, produced by Carl E. Jefferson (*Pure Getz*, Concord Jazz B0000006E2, 1982).

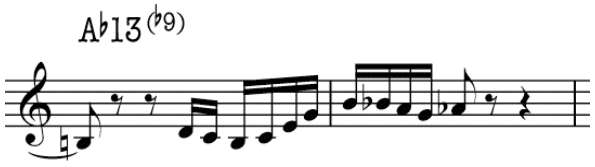
[161] If G♭ were included, we could perhaps understand the improvisational choices to reflect an octatonic collection built on (A♭, A): A♭, A, B, C, D, E♭, F, G♭.

more traditional, chord/scale approach to the phrase is evident in Rosenwinkel's improvisation, transcribed in Example 3.12.[162]

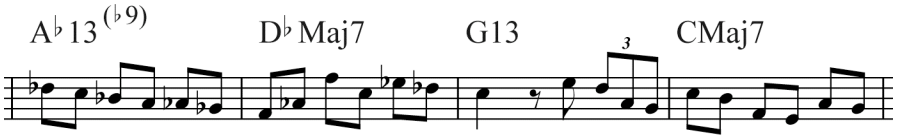
Example 3.11b: Stan Getz, solo on "Very Early" (m. 4, ~4:14-4:16)



Example 3.11c: Stan Getz, solo on "Very Early" (mm. 19-20, ~4:34-4:36)



Example 3.12: Kurt Rosenwinkel, solo on "Very Early" (mm. 4-7, ~4:13-4:18)

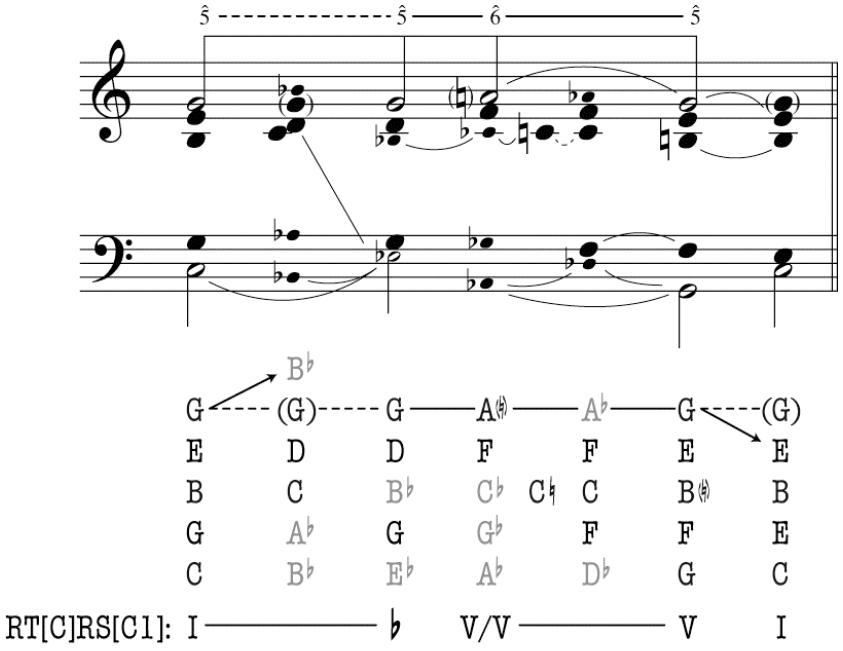


The preceding analytical observations promote hearing a single, referential tonic and corresponding scale in mm. 1-8, the first phrase, of "Very Early." To summarize my claims, Example 3.13 presents a complete realization of this phrase, which supports both RT[C] and RS[C1]. For additional clarity of voice leading, letter names have been included underneath the notated realization. The diagonal arrows in the upper line represent the minor-third leaps that border the melody, while the broken lines represent prolongation of the structural pitch. The most important melodic tones, which can be

[162] Kurt Rosenwinkel, "Very Early," composed by Bill Evans, produced by Jakob Dinesen (*Around,* Stunt 616953, 2001).

understood as consisting of scale degrees $\hat{5}$ and $\hat{6}$ in RS[C1], are supported by a tonic-to-dominant progression. In the example, all pitches that are not explicit members of RS[C1] are represented with smaller noteheads in the music, with their corresponding letter names shown in grey type. Under this representation, we can see how the majority of the pitches are consistent with RS[C1], confirming its prevalence across the phrase as a whole and its members as most referential.

Example 3.13: Realization of Phrase 1, "Very Early," supporting RT[C]/RS[C1]



MODAL JAZZ AND THE ABSENCE OF FUNCTIONAL HARMONY

In the analysis of Evans's "Very Early," the presence of a functional V → I progression at a phrase boundary was a critical factor in determining RT[C] and RS[C1]. This may suggest that, in writing "Very Early," Evans was, at least partially, influenced by traditional jazz harmony and function. In other tunes from the post-bop era, even some by Evans himself, functional progressions are fundamentally absent. Without clear tonal signposts it might seem that the challenges of determining a referential set would grow—

and it does—but, as I hope to demonstrate, so do the benefits. Let us continue by considering a tune in which chord-to-chord relationships are not functional, but that supports a single referential set across sixteen measures.

Consider Example 3.14, which shows the opening sixteen measures of the tune "Time Remembered," which is included as part of the Bill Evans album of the same name.[163] Though its form is not specifically noted on the lead sheet, these sixteen measures comprise Part A of a two-part form. The lead sheet shows only two chord types, min9 and Maj7♯11, and the tune has no Mm7 chords. It, therefore, appears to lack any traditionally functional progressions, such as V → I. In his treatise *Jazz Harmony*, Wolf Burbat claims that tonal relationships in "Time Remembered" are only apparent ones and that it actually has no key or tonal center.[164] He further states that the chords "stand in isolation: that is, no two successive chords belong to the same key."[165] Following a chord/scale approach, the types of chords used in the tune would most likely be analyzed as subsets of particular diatonic modes. For instance, each Maj7♯11 is a subset of the Lydian mode, and each min9 is a subset of either the Dorian or Aeolian mode.

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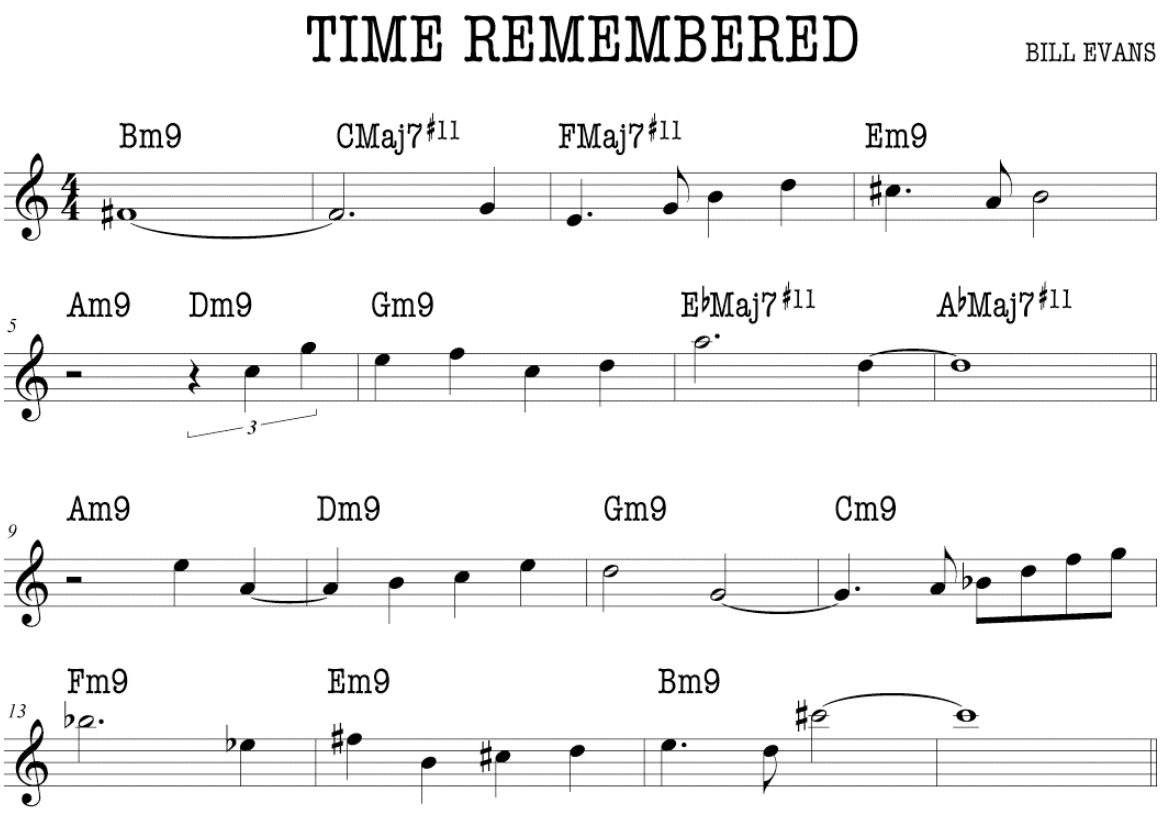
[163] Bill Evans, "Time Remembered," composed by Bill Evans, produced by Orrin Keepnews (*Time Remembered*, Milestone Records M-47068, 1963). Leadsheet transcribed from *Bill Evans Fakebook*, 2nd ed., transcribed and edited by Pascal Wetzel (New York: Ludlow Music, Inc., 2003), 77.

[164] Wolf Burbat, *Jazz Harmony.* 4th ed., translated by Robert Wason (1994), 58.

[165] Ibid. This analysis is not exactly accurate: Amin9 and Dmin9 can both be generated by C Ionian, and Dmin9 and Gmin9 can both be generated by an F Ionian. Gmin9 and E♭Maj7♯11 can both be generated by a B♭ Ionian, but this conflicts with the E♮ in the melody (m. 6).

Example 3.14: The opening 16 measures of Bill Evans's "Time Remembered"

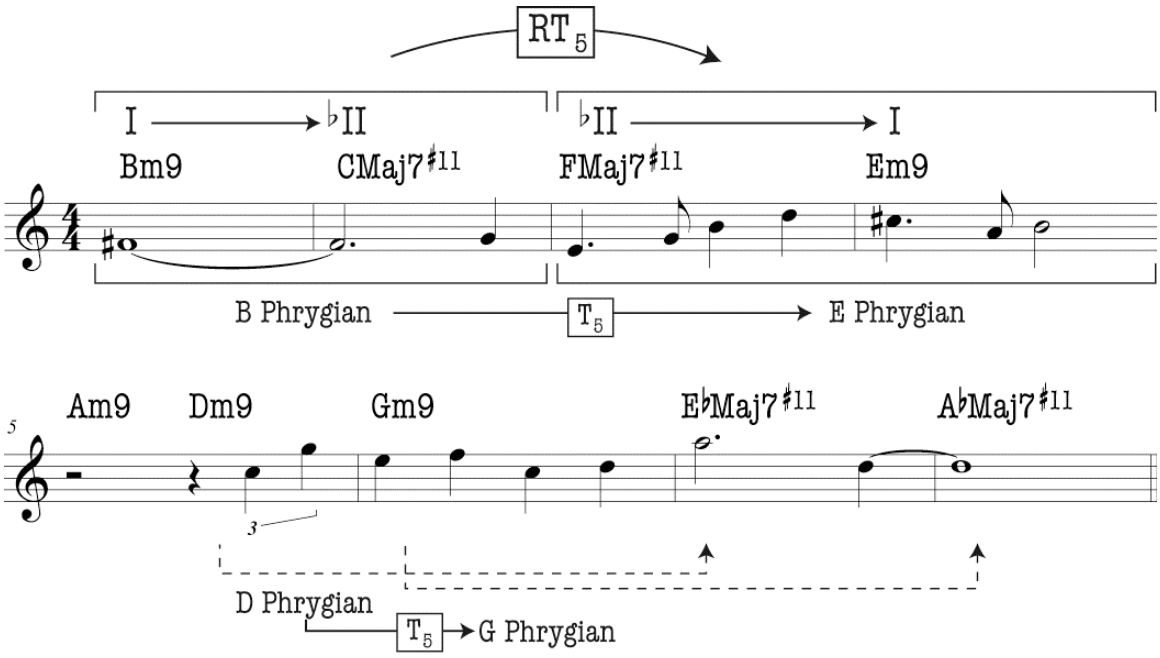


Burbat's observations regarding "Time Remembered" focus primarily on the chords, which, as already mentioned, is a common approach in jazz analysis. Notwithstanding his assertions, there is a variety of ways that one might choose to analyze the chord successions in "Time Remembered." For example, the tune appears to open with a Phrygian-mode progression (I → ♭II in B Phrygian), followed by a transposition of this progression in retrograde, labeled as RT_5, as shown in Example 3.15.[166] Hearing this progression sensitizes me to semitone root relations later in the

[166] A retrograde relationship can also be identified in the melody, when it is expressed as diatonic scale steps. That is, up one step, then down two steps in a B minor diatonic

passage, and so the example also identifies Phrygian-mode progressions occurring between non-adjacent chords in mm. 5-8: I → ♭II in D Phrygian and G Phrygian respectively (as represented by the broken lines). This interpretation, however, does not account for all the chords in the passage, and is contradicted by the ninth included in each of the minor chords.[167]

Example 3.15: Apparent Phrygian-mode progressions in mm. 1-8



Example 3.16 shows another way that we might hear some regular structure in the chord succession. The possibility of this hearing is suggested by the similarity between the two types of chords: a Maj7$^{\sharp 11}$ without its root is a min9. Accordingly, if we interpret the opening Bmin9 as a rootless GMaj7$^{\sharp 11}$, then we can identify an ascending perfect fourth root motion between the first two chords, which is repeated between the chords in

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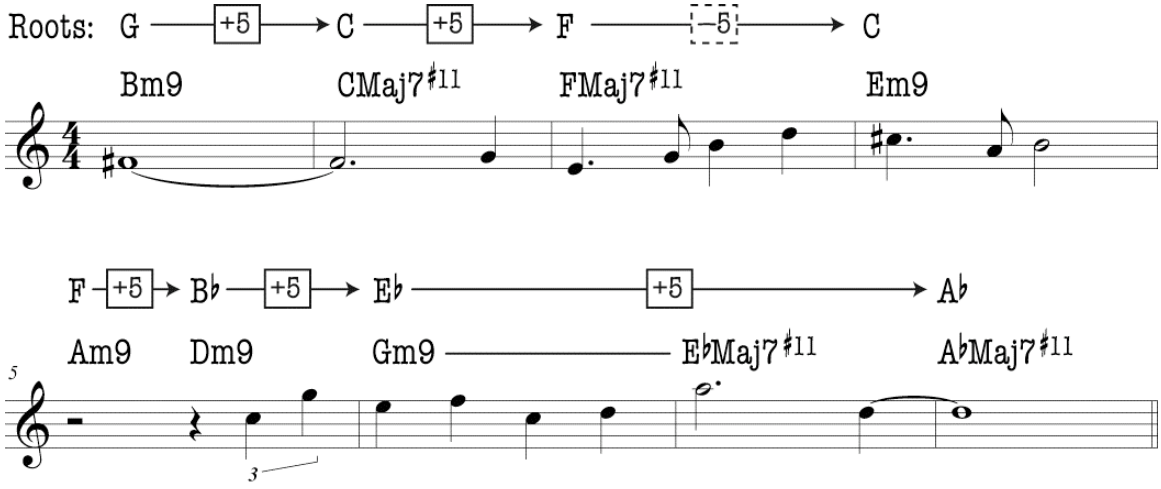
collection. The opening motive's <+1, –2>, specifically expressed as <F♯, G, E>, is restated in retrograde, <–2, +1>, in m. 4 as <C♯, A, B>.

[167] For instance, the ninth in Bmin9 (C♯) clashes with a B-Phrygian collection, and the ninth in Emin9 (F♯) clashes with an E-Phrygian collection.

mm. 2-3. Carrying on in this manner, we obtain the root motion shown above the staves in the example.[168] Of course, the melody's C♯5 in m. 4 and E♮5 in m. 6 challenge this interpretation by suggesting that the chords are subsets of D Ionian and F Ionian, respectively, and not G Ionian and E♭ Ionian.[169]

Example 3.16: Transpositional relationships between rootless and rooted Maj7(♯11) chords



The apparent absence of functional progressions and the strong link between certain chords and specific diatonic scales places "Time Remembered" among the modal jazz compositions of the late '50s and early '60s. The analyses presented above, though plausible, struggle to associate each chord with a specific diatonic scale; Example 3.15

[168] We could also hear each Maj7♯11 chord as a min9 with a note sub-posed a major third below the root, again resulting in fifth-related harmonies: Bmin9 → Emin9/C → Amin9/F → Emin9 → Amin9 → Dmin9 → Gmin9 → Gmin9/E♭→ Cmin9/A♭. This reading may seem beneficial because the passage contains a greater number of min9 chords, resulting in fewer harmonic reinterpretations. However, because it is quite common in jazz to substitute a major chord with a minor chord whose root is a major third above, I find the analysis given in the example to be preferable.

[169] The same could be said of other melody tones not belonging to min9 chords in the passage. Apart from tonics in minor-key tunes, jazz performers often analyze minor chords as subsets of the Dorian mode when improvising. However, because there is no conflicting information on the lead sheet at these particular moments, the analysis in Ex. 16 is at least partially feasible.

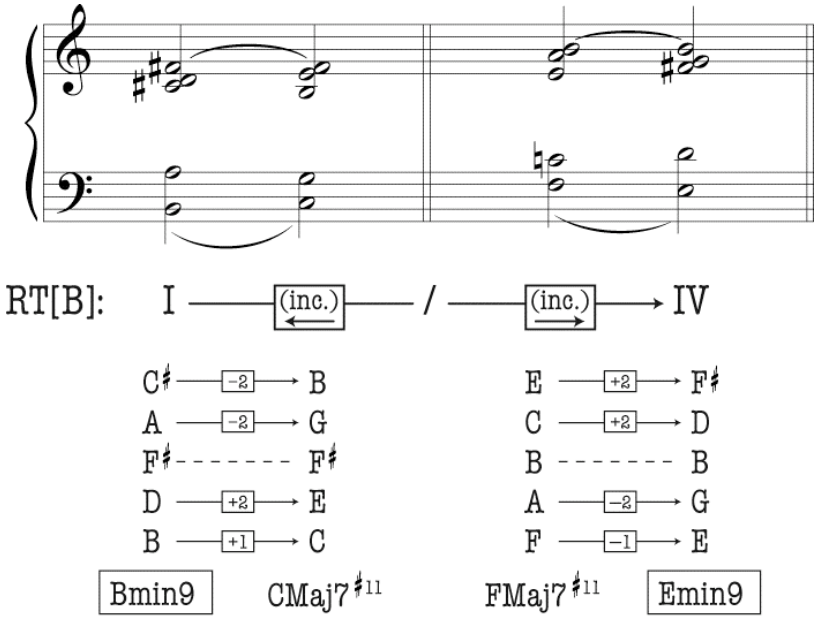
observes relationships between non-adjacent chord, which disrupts the flow of the chord series, and Example 3.16 suggests root relations based on implied roots. Thus, the former seeks Phrygian modes and the latter seeks Lydian modes. Issues such as these, however, can be remedied if one first considers the melody. In so doing, the identity of particular chords will become clearer. More specifically, paying closer consideration to the larger melodic context should help to identify functional ties between particular chords. Therefore, in following the methodology proposed in this dissertation, let us turn our attention towards the melody.

The complete collection of notes that make up the melody in mm. 1-4 constitute a single diatonic collection: <B, C♯, D, E, F♯, G, A>, which we can identify as RS[B6], or B Aeolian.[170] Therefore, despite the chromaticism that ensues with the following chords, it would make sense to identify the opening chord's function to be tonic in B minor, which supports the presence of RT[B]. This discounts the idea that the chord in m. 1 be understood as an incomplete G chord. The last chord harmonizing the RS[B6]-melody is Emin9 (m. 4), which acts rhythmically as a cadence. By choosing to hear this chord as IV in B minor, I can understand a harmonic consistency to the phrase that supports the melodic consistency. Accordingly, I analyze the chords interior to the phrase as harmonically subsidiary, chromatic, incomplete-neighbor chords (labeled inc., with the arrow directed towards the chord being embellished), as shown in Example 3.17: CMaj7$^{\sharp 11}$ ornaments Bmin9 as a suffix in the same way that FMaj7$^{\sharp 11}$ ornaments Emin9 as a prefix. These chords are non-functional but continuative, as symbolized by "/" (forward slash) in the example. In each case, the ornamental harmony can be understood as resulting from specific voice leading patterns. The fifth of the first chord, which is heard in the melody, is sustained into m. 2, acting as a common tone between the first

[170] This particular ordering is based on various musical determinants, to be discussed shortly.

two chords (represented by the broken lines). The other voices move by tone or semitone as shown. The staves in the upper portion of Example 3.17 show a possible arrangement for these chords. This voice leading is duplicated in retrograde between the chords in mm. 3-4, accompanied by the semitone step between chord roots. What is more, the note B is common to all four chords, further supporting the idea of B as referential tonic.

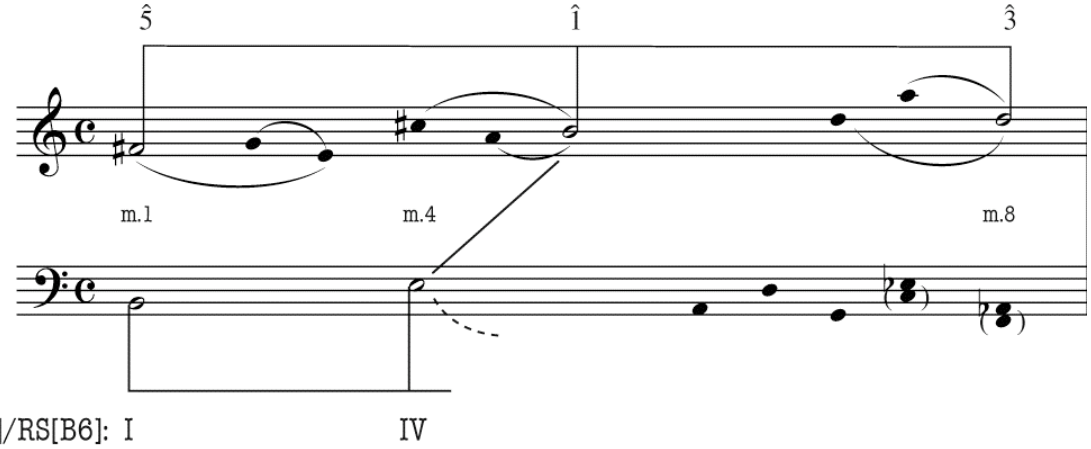
Example 3.17: Structural harmonies ornamented by incomplete neighbor chords, mm. 1-4



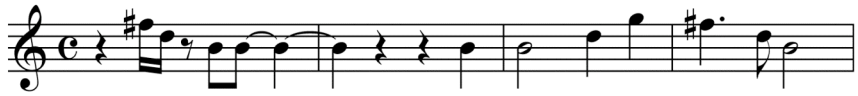
There are other factors that support B as referential tonic in "Time Remembered," in addition to RS[B6]. For instance, durational accents in the melody emphasize the tonic chord, B minor, through arpeggiation over the first eight measures of the tune, as shown in the upper portion of Example 3.18. Also, to judge from the way that jazz musicians have improvised on this tune, they also conceive of a B Aeolian scale persisting across the non-B minor chords in mm. 2-3. Examples 3.19a-d show improvisations by Evans, guitarist Jim Hall, and Jakob Dinesen, all of which stay entirely within RS[B6]. The presence of G♮ and not G♯ in both Evans's and Hall's solos (Ex. 3.19a-c) supports the use of this set in favor of B Dorian. Details such as these allow me to understand RS[B6] as

the referential set for the progression, with B acting as referential tonic; C♮ and F♮ in the harmonies of mm. 2-3 are, as a result, understood as chromatic alterations within this set, and not as shifts to alternate sets.[171]

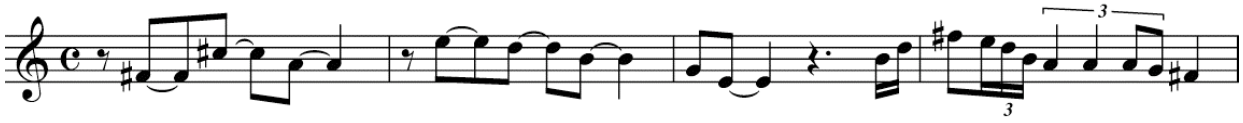
Example 3.18: The arpeggiation of B minor, mm. 1-8



Example 3.19a: Bill Evans's solo on "Time Remembered" (mm. 1-4, ~1:36-1:43)



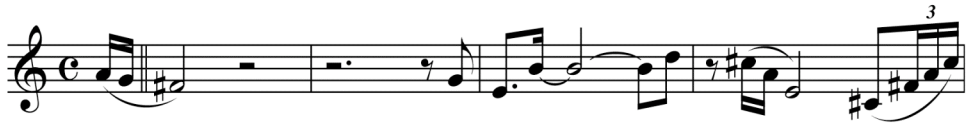
Example 3.19b: Bill Evans's solo on "Time Remembered," (mm. 1-4, ~3:57-4:06)[172]



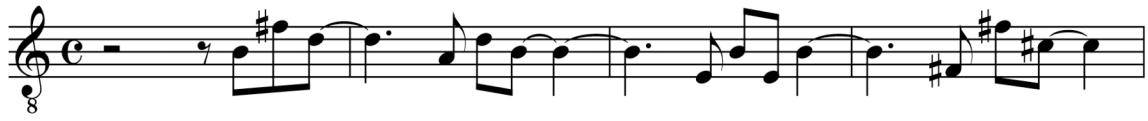
[171] More specifically, the harmonies in mm. 2-3 are not understood as being generated by C Lydian and F Lydian collections. They remain members of RS[B6], containing chromatically altered pcs. This is supported not only by the strong melodic presence of RS[B6] throughout the first four measures, but also by the return of a harmonic member of the set, Emin9, whose relationship with the tonic has already been described.

[172] Bill Evans, "Time Remembered," composed by Bill Evans. This excerpt is transcribed from an alternate take, included on *The Complete Riverside Recordings* (Riverside Records RCD-018-2, 1982).

Example 3.19c: Jim Hall's solo on "Time Remembered" (mm. 1-4, ~1:57-2:06)[173]



Example 3.19d: Jakob Dinesen's solo on "Time Remembered" (mm. 1-4, ~0:59-1:08)[174]

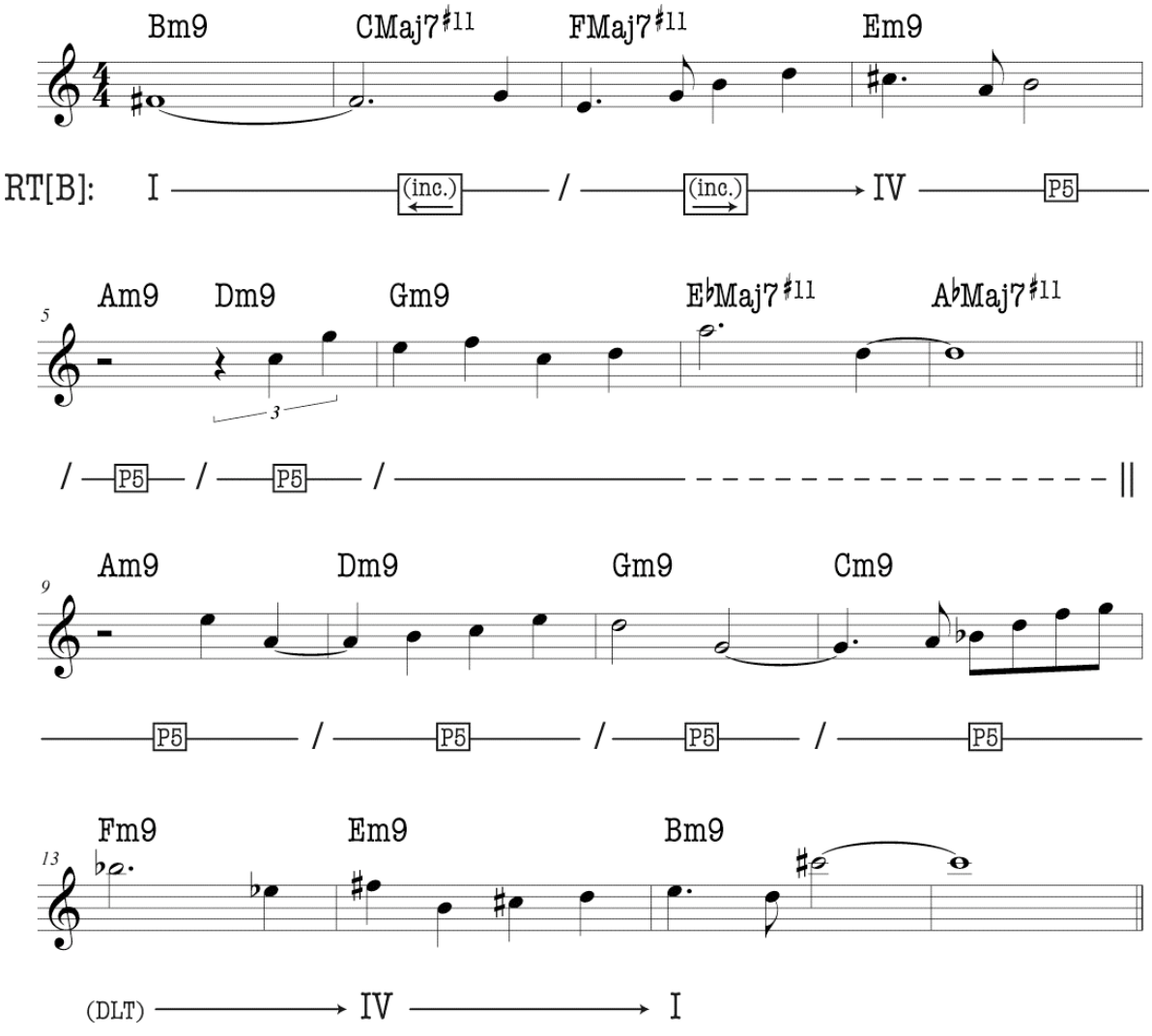


The descending fifth observed earlier between Bmin9 and Emin9 is reiterated between subsequent chords. Thus, the chord series used in "Time Remembered" can be understood as being based on a sequential progression common in many jazz tunes, with a repeated root motion of a perfect fifth. Since none of these chords are Mm7ths, however, the series leaves the impression of transposition rather than tonal function. The descending perfect-fifth cycle is momentarily interrupted in mm. 7-8 by Maj7$^{\sharp 11}$ chords (E♭Maj7$^{\sharp 11}$ and A♭Maj7$^{\sharp 11}$, respectively), before restarting again in m. 9.[175] In m. 9, the cycle is extended to Fmin9 (m. 13), after which it breaks, changing to Emin9. This chord series provides continuity, but no clear sense of key. So the tune up to this moment may be analyzed as shown in Example 3.20. The example shows the tonic B minor chord (I) progressing to a subdominant E minor chord (IV), each ornamented with its own incomplete neighbor chord, as described above. The arrowhead on the line just before IV

[173] Jim Hall, "Time Remembered," composed by Bill Evans, produced by Orrin Keepnews (*Time Remembered*, Milestone Records M-47068, 1963).
[174] Jacob Dinesen, "Time Remembered," composed by Bill Evans, produced by Ole Matthiessen and Jakob Dinesen (*Everything Will Be Alright*, Stunt 2152, 2003).
[175] As expressed in footnote 167, it is possible to conceive of Maj7$^{\sharp 11}$ chords as min9 chords with an additional note subposed a major third below the root. By following this conception, one could hear Gmin9 continuing into m. 7 (specifically, Gmin9/E♭), followed by another fifth-related chord, Cmin9 (or, specifically, Cmin9/A♭) and, thus, continuing the cycle into m. 8. This hearing is, in fact, suggested in mm. 11-12, where Gmin9 is followed by Cmin9.

indicates that this harmonic motion begins in m. 1 and continues through mm. 2-3 before arriving in m. 4. Following this, the lines are labeled P5 to show that they are taking part in the descending perfect-fifth cycle. As in the previous example, the forward slash represents continuity. The double-line (||) following m. 8 indicates that the sequence breaks, and the following lines labeled P5 indicate that it restarts in m. 9. No arrowheads are included on these lines since there is no harmonic motion within a key.

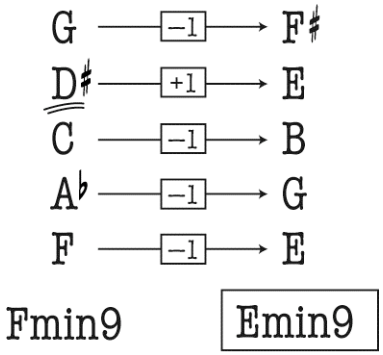
Example 3.20: Harmonic motion in mm. 1-16



The sequence continues until it achieves an F-rooted chord. The last such chord we heard (m. 3) progressed by stepwise voice leading to Emin9. The F chord in m. 13 does too, and the resulting E chord then progresses to a rhythmic cadence on the chord that began the tune, Bmin9, which I hear as tonic. As a result, a sense of tonality is restored around m. 14, as indicated by the arrows and Roman numerals included in the previous example. Interestingly, the quality of this second F chord is changed from Maj7$^{\sharp 11}$ to min9. Changing the chord quality in this way presents the possibility of hearing a more efficient voice-leading motion to Emin9, as shown in Example 3.21. Because the quality of the two chords is identical, it is easy to assume a semitonal shift between each chord member, where Fmin9 slides down by semitone to Emin9. However, as is depicted in Example 3.21, I can attribute a sense of quasi-functionality to Fmin9 by hearing it as a type of augmented-sixth chord.[176] Such a hearing requires an enharmonic reinterpretation of the chordal seventh, E♭, producing two leading tones to E: upper (F♮) and lower (D♯).[177] I understand the D♯, therefore, to have dominant function, and the example labels Fmin9 as "DLT" (double leading tone). The subsequent arrival of Emin9 initiates a plagal progression, and a return to tonic harmony to close the section. This close is emphasized by durational accent resulting from slowed harmonic rhythm in mm. 15-16, where Bmin9 occupies two measures.

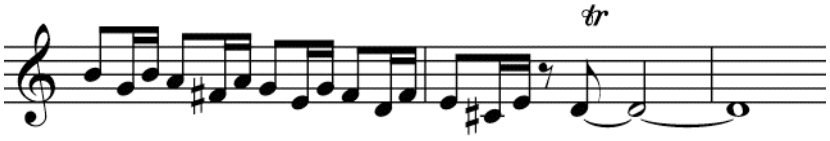
[176] The voice leading posited in Example 3.21 is also characteristic of a tritone substitution, common in jazz writing, where the literal dominant harmony (in this case, B7) is substituted by a dominant harmony whose root is a tritone away (in this case, F7).
[177] The example excludes the chordal seventh over Emin in order to show the double leading tone function. However, it would not be uncommon for the leading tone to fall by semitone to the seventh of the chord of resolution (in this case, D♯ → D♮) in a seventh-heavy vocabulary. Also noteworthy is how, when performing multiple choruses of the tune, the closing harmony, Cmin9 (mm. 25-26, not shown) has a similar double leading tone approach to the opening Bmin9.

Example 3.21: "Double leading-tone chord," Fmin9 (m. 13), approaching IV, Emin9 (m. 14)

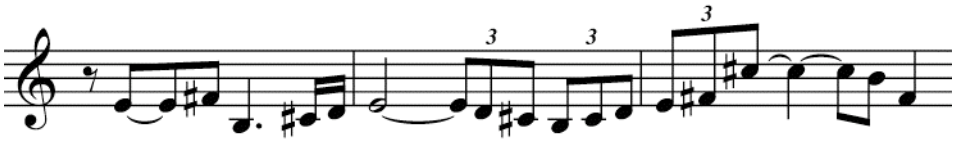


The return to RS[B6] in m. 14 is also evident in the improvisations. Example 3.22a is another excerpt from Jim Hall's solo on this tune, and Example 3.22b is taken from a solo by jazz saxophonist Zoot Sims. In both examples, the musicians restrict themselves to RS[B6] over both Emin9 and Bmin9.[178]

Example 3.22a: Jim Hall's solo on "Time Remembered" (mm. 14-16, ~2:26-2:33)



Example 3.22b: Zoot Sims's solo on "Time Remembered" (mm. 14-16, ~3:28-3:34)[179]



The preceding analysis shows how, despite Burbat's skepticism about tonality in Bill Evans's "Time Remembered," the first sixteen measures of the tune can be heard to assert a particular preference for B over other pitches, and, therefore, to suggest it as

[178] Following traditional chord/scale theory, it would be common to use E Dorian when improvising over m. 14. However, by not playing G♯ in mm. 15-16, it is possible to retain my sense of RS[B6] across all three measures.

[179] Zoot Sims, "Time Remembered," composed by Bill Evans, produced by Orrin Keepnews (*Time Remembered*, Milestone Records M-47068, 1963).

referential tonic. Further, pitch content in the melody, which is retained in various improvisations by leading jazz practitioners, asserts RS[B6] as the governing set in these measures. In determining this, my analysis identifies traditional harmonic root-motion (perfect-fifth cycle), and ornamental harmony resulting from specific voice leading patterns (mm. 2-3), including double leading-tone chords (m. 13 and m. 26), in what is otherwise a characteristically modal jazz tune.

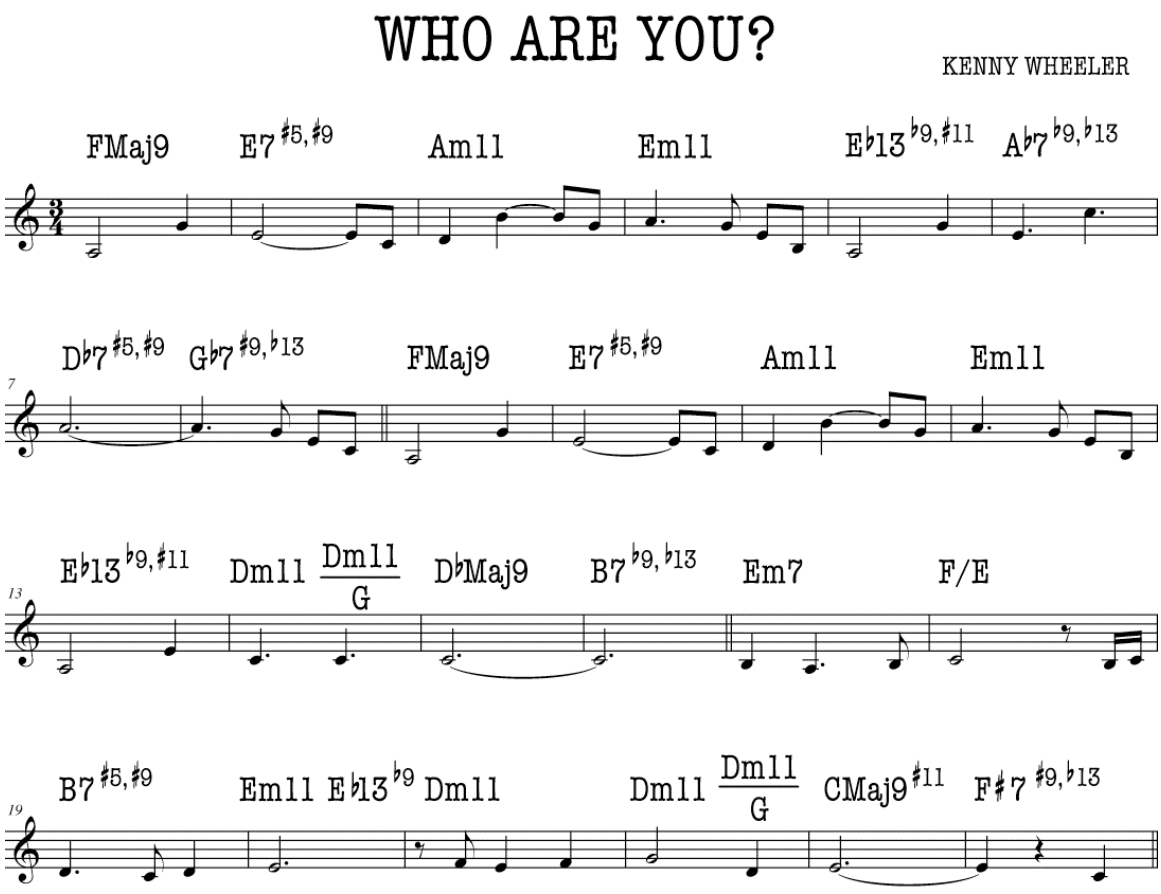
REFERENTIAL SET THEORY AND CONTEMPORARY JAZZ: A COMPLETE TUNE

Both of the Evans examples presented above share particular elements that are characteristic of contemporary jazz writing. For instance, both tunes feature chords that are explicitly connected to scales, such as $Maj7^{\sharp 11}$ ("Time Remembered"), which is a subset a of the Lydian mode, and $Mm7^{\sharp 11}$ ("Very Early;" refer to footnote 154), which is a subset of the Lydian-dominant mode. Both tunes also feature non-functional chord successions, essentially suppressing the perception of continuity within a single key. Despite these, however, the analytical approach provided by referential set theory helps to prioritize particular pitches over others, revealing relationships that exist beyond the single measure. In "Very Early," I showed how a single RS governs the opening eight measures of the tune; in "Time Remembered," a single RS extends across the first sixteen measures. Now, let us look at a composition in which a single RS prevails over the entire thirty-two measures of the tune.

Compositional practices developed in post-bop and modal jazz remain characteristic of more recent jazz writing and, therefore, continue to support the application of referential set theory. Consider, for instance, Example 3.23, which shows the complete lead sheet for Wheeler's "Who Are You?," the opening of which was

discussed in the preceding chapter.[180] A contemporary of Bill Evans, Kenny Wheeler remains an active member of the professional jazz community, currently residing in the UK.[181] "Who Are You?" is featured on the album *Azimuth '85*, released in 1985 by the ensemble Azimuth, and features Wheeler on trumpet, John Taylor on piano, and Norma Winstone on vocals.

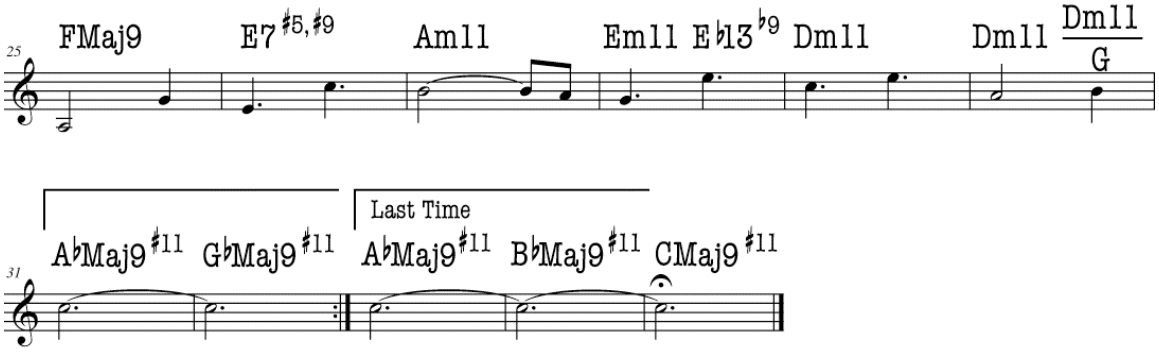
Example 3.23: Lead sheet for "Who Are You?"



[180] Azimuth, "Who Are You?," composed by Kenny Wheeler and Jane White, produced by Manfred Eicher (*Azimuth '85*, ECM Records ECM 1298, 1985). The transcription in Example 3.23 is transcribed from a hand-written copy made by Wheeler.

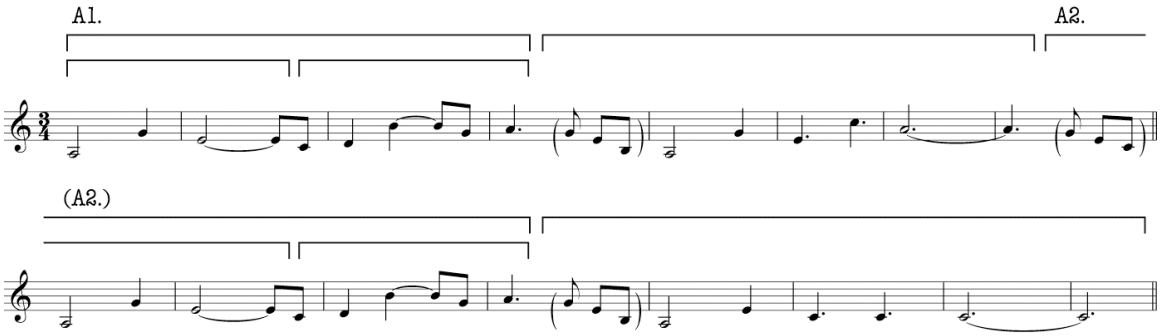
[181] The Evans album entitled *Quintessence* (1976, Fantasy) includes a recording of the Wheeler tune "Sweet Dulcinea Blue." Thanks to Brian Shaw for drawing my attention to this.

Example 3.23: (continued)



The tune consists of 32 measures: an AABA song form, in which each section spans eight measures. Example 3.24 shows the melodic organization of mm. 1-16, the first two A Sections, labeled as A1 and A2, respectively. Parallelism between the two sections results from the repetition of mm. 1-5 (beat 1) in mm. 9-13 (beat 1), and from the manner in which both eight-measure segments can be subdivided into four-measure segments, the first of which (in each case) consists of a two-measure motive that is repeated. Though the second four measures in A1 and A2 are different, I hear them both as continuous phrases. In the example, notes contained in parentheses represent pick-ups to the following measures.

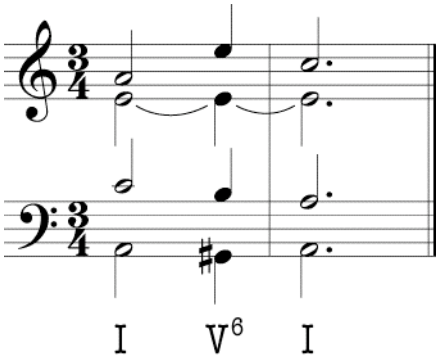
Example 3.24: Melodic organization in "Who Are You?" (mm. 1-16)



The analysis included in Chapter 2 showed how both pitches A and E are prioritized in the melody of mm. 1-8. A quick glance through the remainder of Example 3.24 shows that emphasis on these two notes continues throughout. Also noteworthy is

the extended time spent on C_4, which essentially lasts for the final three measures. Therefore, the first sixteen measures of "Who Are You?" can be understood as emphasizing the members of an A minor triad. Indeed, as Example 3.25 shows, it is even possible to hear the end of the melody in mm. 13-14, <A_4, E_5, C_4>, harmonized to support RT[A], although this would be non-stylistic.[182]

Example 3.25: Hypothetical harmonization of final three melodic notes, supporting RT[A]



In contrast with the two Bill Evans tunes discussed earlier in this chapter, I already noted in Chapter 2 that the melody in Wheeler's "Who Are You?" is based entirely on a single diatonic (white-key) collection. Although the melody is eventually harmonized in a highly chromatic manner, the performance on the aforementioned recording features Winstone singing the first sixteen measures unaccompanied, which allows the listener to become acquainted with the diatonic collection prior to any harmonic elaboration and embellishment.[183] Therefore, in conjunction with the analytical observations made so far, I posited RS[A6] as a referential set for the tune. Of course, in the absence of harmonic support, the extended time spent on C_4 in mm. 14-16 could result in a hearing that prioritizes RT[C] over RT[A]. In this case, the corresponding

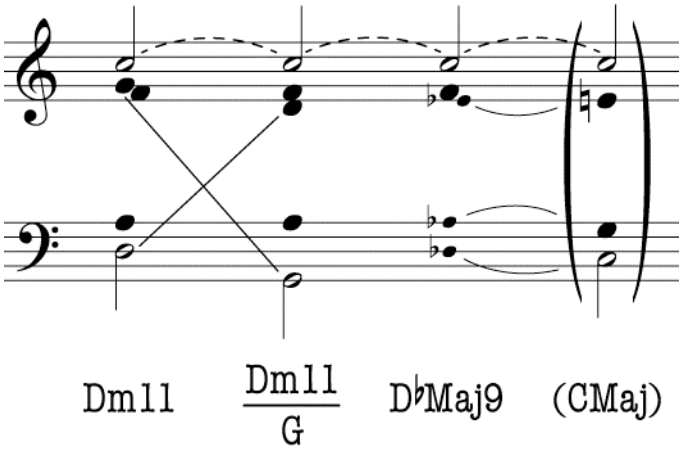
[182] For clarity, the example transposes the melody up one octave.

[183] Pitch class F is not stated in the first sixteen measures of the melody. It is not until the downbeat of m. 21, with the entrance of F_4, that the diatonic collection is therefore completed.

referential set would be RS[C1], a rotation of RS[A6]. The ambiguity is perhaps symbolic of the question posed by the title of the tune.

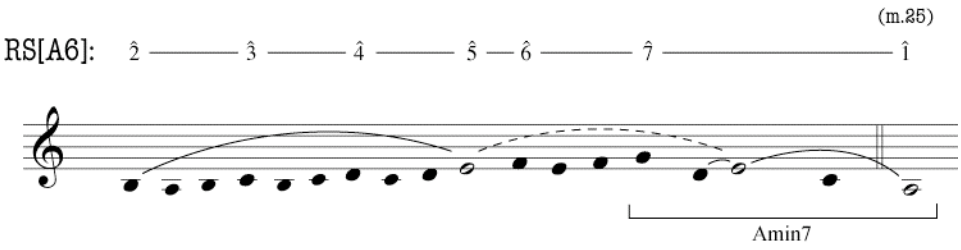
The analysis in Chapter 2 showed how the chords in mm. 1-8 could also be understood as supporting both RT[A] and RS[A6]. This set is further reinforced when mm. 1-5 repeat exactly in mm. 9-13. In m. 14, a new, RS[A6]-member chord enters: Dmin11. For the first time in the tune, the bass has two pitches indicated in a single measure, since the lead sheet includes both Dmin11 and Dmin11/G in this measure. This bass line recalls a traditional II → V cadential motion to C. However, because the leading tone, B♮, is not included, the pull towards C is reduced. In m. 15, Wheeler introduces D♭Maj9, which results in a deceptive—or, one might say, "hyper-deceptive"—cadence, which combines components of the tritone substitute for G7 (V7 of C major) and the expected tonic chord, placing the tonic pitch a major-seventh above the root. Example 3.26 shows how, in adhering to Heuristic 3, D♭Maj9 can be understood as an "altered" version of the expected chord. In this regard, despite the fact that the melody clearly asserts a governing referential set, the harmonies impede our ability to assuredly determine a governing tonic for the tune. Accordingly, the example reveals how, in contrast to Example 3.25, it is possible to understand the melody's C_4 as the tonic pitch, and not as the third of A minor.

Example 3.26: D♭Maj9 as an alteration of an expected C major chord



Although the conjunct melody of the B Section contrasts with the leaps of the preceding music, it nevertheless reinforces RS[A6]. Example 3.27 presents a reduction of the B Section's melody, along with the first measure of the succeeding A Section. It shows, by annotating the melody with scale degrees, how it ascends through almost the entire RS; and how the final set member occurs on the downbeat of m. 25. The first three members of the progression are ornamented with lower neighbor notes, and culminate on a durational accent on E_4. This accent temporarily halts the stepwise ascent, and so I hear the motion from B_3 to E_4 as connected, and indicative of the fifth and root of E. The combination of these factors, as well as the durational accent on E_4 when it recurs in mm. 23-24, suggest that this is the most structural note in the section. Accordingly, it is represented with an open notehead. However, because the ascent seems directed towards A (attained an octave lower by the A_3 beginning the A-Section repeat) and because the B Section's melody sustains the same pc-collection used earlier in the tune, I retain my sense of RT[A]. Therefore, I hear the structural note in the B Section as the fifth, or dominant, of A.

Example 3.27: Structural melody of B Section (mm. 17-25)



The closing of the B Section's melody, and completion of the RS, also includes a previously established motive that reinforces the RS. Specifically, the melodic leaps that occur in the final two measures of the B Section outline a C major triad.[184] When

[184] D_4 functions as an incomplete neighbor to E_4, the most structural note in the B Section.

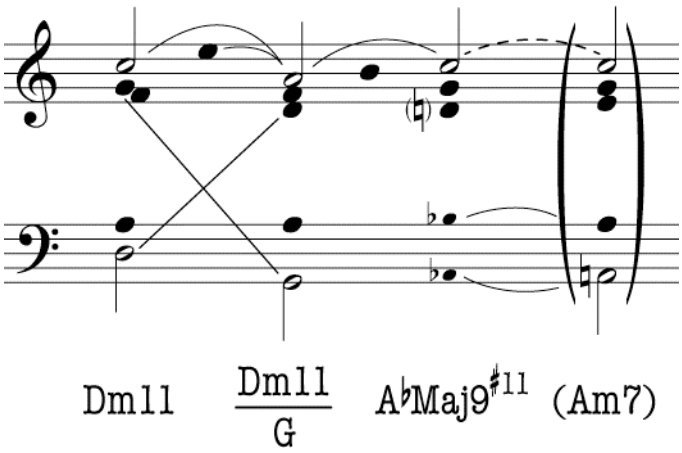
combined with A_4 (m. 25), the result is an arpeggiated Amin7 chord—the referential sonority that occurred multiple times in the tune's first two A Sections. The only difference is that the pc that originally initiated the motive has been transferred to the end; thus, <A, G, E, C> has been rotated to become <G, E, C, A>.

The chords in the B Section also support the tune's prevailing RS in various ways. Five of its eight measures contain chords that are comprised exclusively of white-key pitches (Emin7, F/E, Emin11, and Dmin11), and are, thus, subsets of the white-key collection. CMaj9$^{\sharp 11}$ is *almost* exclusively white key, with the exception of F♯ (♯11). In the event that one hears the A Section's melody supporting RT[C], particularly as a result of the "deceptive" cadence heard at the end of section A2, it could be possible to hear the B Section closing on the first "tonic" harmony of the tune (the first chord whose root is C). However, the dissonant, and non-RS member, F♯ might conflict with this hearing. Though it is not uncommon for jazz tunes to include a raised eleventh over an otherwise stable major-tonic chord, this added note recalls the characteristic tritone that has proven to be so prominent throughout the tune, and supports the idea that the root of the chord is disrupted by the presence of its tritone-related counterpart. Those B-Section chords whose members are not a part of the white-key collection are secondary dominants (or their tritone substitutes) of white-key triads: B7$^{\sharp 5, \sharp 9}$ is V7 of E minor, E♭13$^{\flat 9}$ is a tritone substitution for V7 of D minor, and F♯7$^{\sharp 9, \flat 13}$ is a tritone substitution for V7 of F major (m. 25).

At the end of the final A Section, we again hear melodic and harmonic progressions that point towards C as tonic, just as we did at the end of A2. As in m. 15, the anticipated tonic is undercut by a deceptive resolution, this time, however, to A♭Maj9$^{\sharp 11}$. Example 3.28 includes the chord series used in these measures, and shows how the non-RS members of A♭Maj9$^{\sharp 11}$ can be understood as alterations of Amin7—the

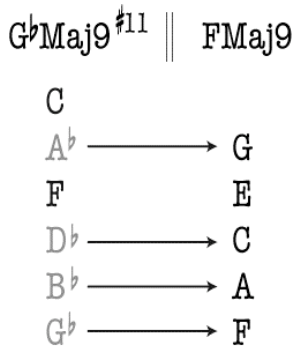
referential sonority that was expressed throughout the tune's melody. As a result, the identity of the tune's tonic remains ambiguous until the end of the form.

Example 3.28: Chord series used in mm. 29-31



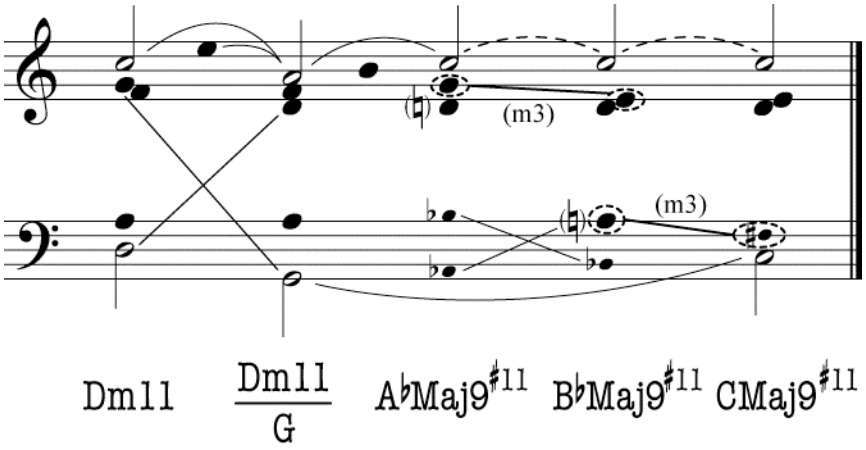
Following A♭Maj9$^{\sharp 11}$ (m. 31), in preparation for the repetition of the form and its opening FMaj9 chord, Wheeler substitutes a traditional Mm7 chord with a semitone-related harmony: G♭Maj9$^{\sharp 11}$. Though this chord shares only two notes in common with RS[A6], F and C—the root and fifth of its goal chord—all of its members are related to those of the tonic chord by maximally smooth voice leading, as shown in Example 3.29. Like the "double leading tone" chords identified in Evans's "Time Remembered," this can be heard as a tritone substitute for a C-rooted chord, the actual dominant of F major. Were this an actual tritone substitute, it would include F♭ and not F♮; in either case, the chord tone in question is a member of RS[A6]. Since, however, the quality is not Mm7, this chord might better be described as a prefix chord to the tune's opening chord. Heard in this way, the chord does not disrupt my sense of the thus-far-prevailing RS.

Example 3.29: Pitch-class content and partial voice leading between chords in m. 32 and m. 1



Tonic ambiguity resurfaces in the closing measures of "Who Are You?," which are only played during the final chorus. The final chord of the tune is the same one used in the penultimate measure of the B Section, CMaj9$^{\sharp 11}$, perhaps reaffirming C's status as RT. Following the return of A♭Maj9$^{\sharp 11}$, Wheeler replaces G♭Maj9$^{\sharp 11}$ with B♭Maj9$^{\sharp 11}$. Like G♭Maj9$^{\sharp 11}$, which reminded me of a tritone substitute for a C-rooted chord, B♭Maj9$^{\sharp 11}$ reminds me of a tritone substitute for the dominant of A. By using a MM7, and not a Mm7, the pull towards A is reduced on account of not having its leading tone (where A♭ = G♯); this pc, of course, in included in the chord just prior, A♭Maj9$^{\sharp 11}$. Also, the raised-eleventh produces the A's dominant pitch, E♮. Example 3.30 shows how, between A♭Maj9$^{\sharp 11}$ and B♭Maj9$^{\sharp 11}$, the lower voices might be understood as taking part in a chromatic voice exchange, in which A♭ "resolves" up to RT[A]. In the upper voices, the seventh above A♭ leaps down a minor third to the ♯11 above B♭, anticipating the arrival of C major. This gesture is then mimicked when the seventh above B♭ leaps down to F♯, the ♯11 above C.

Example 3.30: Final measures of "Who Are You?"



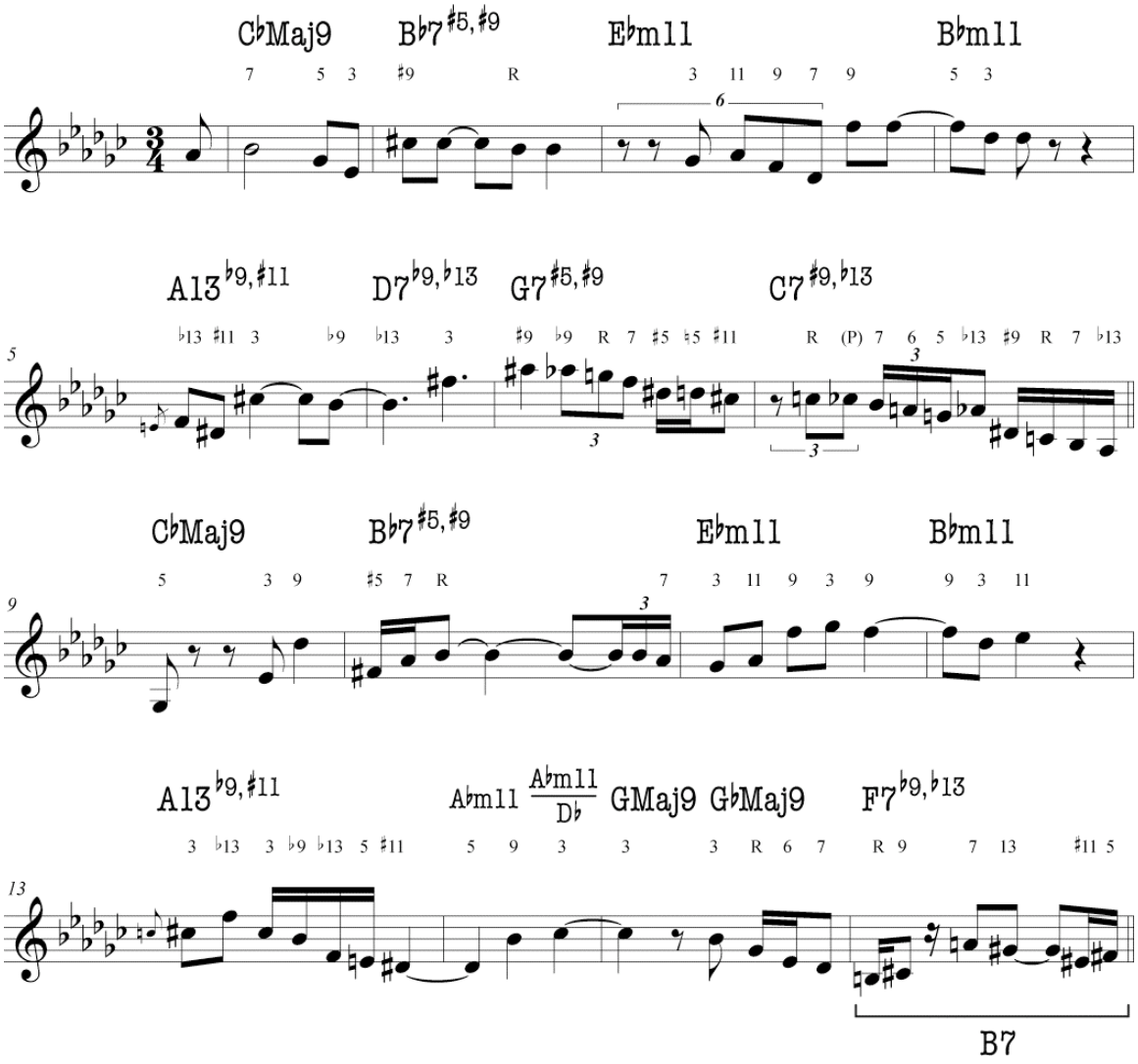
This discussion shows that the idea of referential set theory—that a single collection can be heard to persist across complex changes—is manifest in the melody and chords on the lead sheet of "Who Are You?" This is even more strikingly clear in Wheeler's trumpet solo that immediately follows. Just prior to the start of the solo, John Taylor modulates to a new tonal center, resulting in a tritone-transposition of the entire form. In the following analysis, I will show how strongly Wheeler's solo retains RS[E♭6].[185]

Example 3.31 is a transcription of his playing over mm. 1-16. The recording includes a chromatic passing chord (G♭Maj9) in m. 15, which is not included on the lead sheet. Above the staves in the example, pitches are labeled as members of the underlying (transposed) lead-sheet chords, the way they would be conceived in chord/scale theory. This results in a profusion of accidentals and some awkward-looking melodic successions; for instance, it shows $C\sharp_5$ in m. 2, which is the ♯9 over B♭, descending by augmented second to the chordal root (R). The example also highlights how, in mm. 5-8,

[185] The tritone relationship between the vocal and instrumental sections is highlighted more locally throughout the tune by the many tritone-substituted chords, as discussed above.

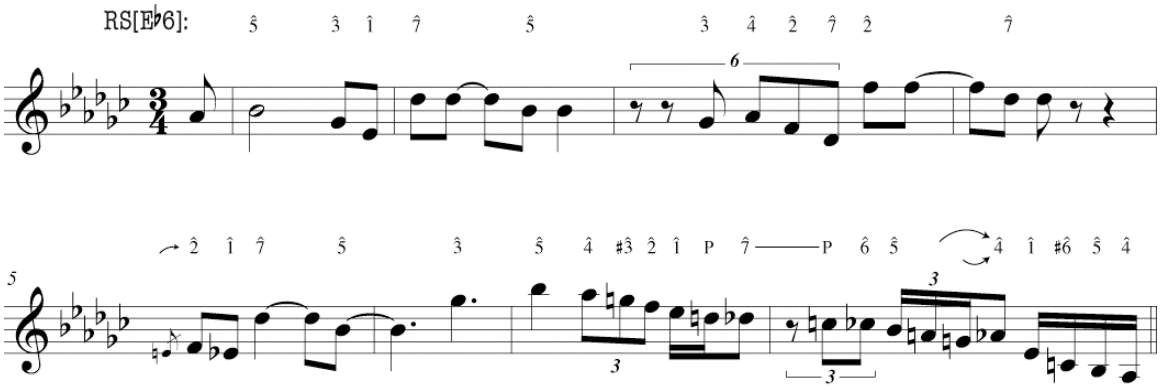
Wheeler includes many of the notated harmonic alterations in his improvised line, such as D♯4 and B♭4 in m. 5 (the ♯11 and ♭9 over A, respectively), B♭4 in m. 6 (the ♭13 over D), A♯5 and D♯5 in m. 7 (the ♯9 and ♯5 over G, respectively), as well as A♭4 and D♯4 in m. 8 (the ♭13 and ♯9 over C). Similarly, he plays F♯4 over B♭ in m. 10 (♯5), and B♭4 and D♯4 over A in m. 13 (♭9 and ♯11). In m. 16, Wheeler does include both of the noted altered extensions in his solo. However, based on the overall choice of notes in this measure, it seems more appropriate to analyze Wheeler's solo here to be based on B7, the tritone substitution of the noted F7. Therefore, the chord tones have been labeled according to B7.

Example 3.31: Kenny Wheeler's solo with chord-tone analysis, "Who Are You?" (mm.1-16, ~1:15-1:47); *rhythm approximate*

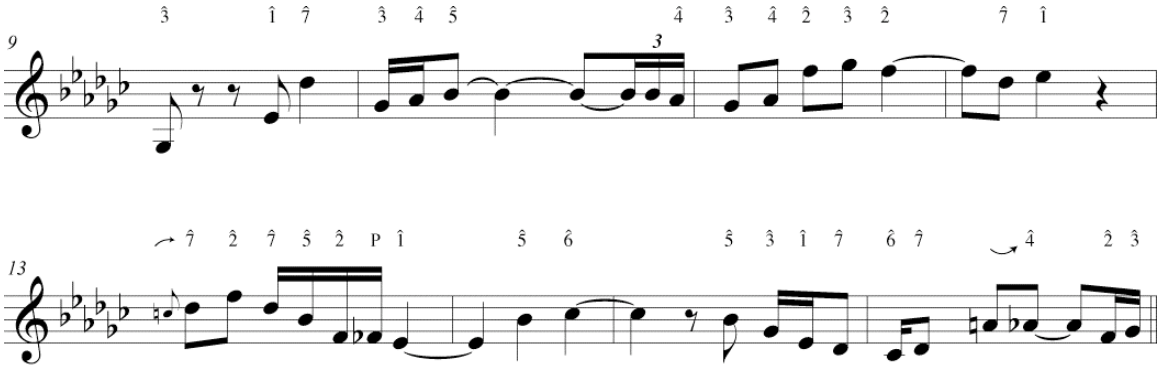


In accordance with Heuristic 1 (prefer to identify only a single RS), Example 3.32 renotates Wheeler's solo exclusively in RS[E♭6]—the tritone transposition of the RS that was posited during the head (RS[A6]). We can immediately see that there are significantly fewer accidentals than in the previous example, revealing the fact that, regardless of the underlying chords, the majority of Wheeler's solo is consistent with the overarching RS. For instance, the C♯ → B♭ augmented-second leap in the second measure of Example 3.31 is enharmonically reinterpreted as a minor third from $\hat{7} \rightarrow \hat{5}$ (D♭ → B♭) in RS[E♭6]. Indeed, *every* note between mm. 1-6 can be understood as a member of RS[E♭6], except for a single grace-note E♮$_4$ in m. 5, which I hear as a chromatic lower neighbor to F$_4$. And this referential set persists through to m. 16. In m. 7, Wheeler momentarily deviates from RS[E♭6] and raises $\hat{3}$ in order to accommodate the chordal root in that measure (G♮)—this is similarly the case in m. 8, where C♭ ($\hat{6}$ in E♭) is temporarily altered and raised to C♮ ($\sharp\hat{6}$ in E♭). Following this, D♮$_5$ is analyzed as a chromatic passing tone that connects $\hat{1}$ to $\hat{7}$, which is then similarly connected to $\hat{6}$ across the measure, identified by the horizontal line in the example. In m. 8, $\hat{6}$ is approached by a chromatically-altered double-neighbor figure, represented by the curved lines with arrowheads. Mm. 9-15, with the exception of a grace note and a chromatic passing tone (both found in m. 13), are all members of RS[E♭6]. In the final measure, A♮$_4$ is analyzed as an appoggiatura that resolves to a member of the referential set, A♭.

Example 3.32: Kenny Wheeler's solo with RS[E♭6] analysis, "Who Are You?" (mm. 1-16, ~1:15-1:47); *rhythm approximate*



Example 3.32: (continued)



By hearing Wheeler's improvised solo in this way, we can see that, as in the original melody, he can well accommodate many apparently chromatic harmonies with a single referential set. The few pcs he plays that are not members of the set can, in the majority of cases, be understood as chromatic alterations of RS-members, minimizing our sense of deviation. Ambiguity that arises as a result of changes in pc-prioritization, as well as chord substitution (particularly by tritone), may be heard to express the question "Who Are You?" posed by the title of the tune, but they do not change the underlying collection.

The preceding analyses have confirmed that the flexible and eclectic analytical strategy outlined in referential set theory, which incorporates familiar concepts from both traditional jazz theory (such as tritone substitution) and traditional tonal theory (especially melodic and harmonic prolongation), provides an effective and economical way to account for the pitch content and pitch relationships of varying lengths in contemporary jazz writing. Regardless of whether or not functional progressions are present, RS theory generates analyses that are contextually specific to each tune. This is especially well represented in the analysis of "Who Are You?," which promotes the retention of a single set across the entirety of a highly chromatic tune. Of course, characteristics such as this are rather special, especially in contemporary jazz writing. Therefore, let us proceed by examining some other representative examples.

CHAPTER 4

CHANGING TIMES, CHANGING SETS: KENNY WHEELER REVISITED

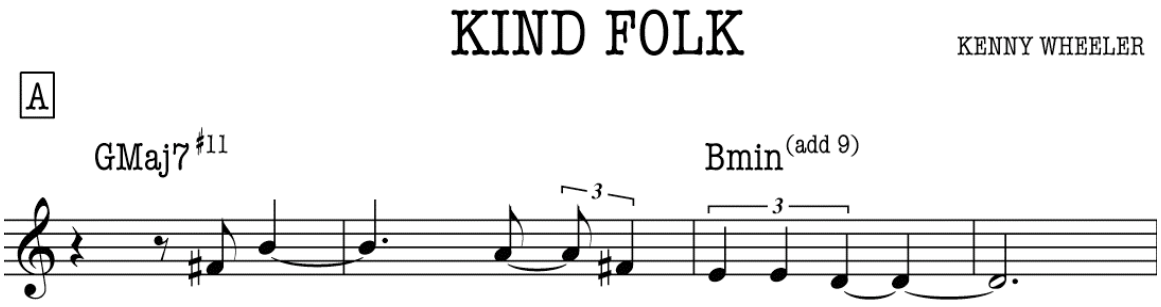
In the previous examples of post-bop and modal jazz writing, the application of referential set theory helped prioritize a particular pc set across highly chromatic passages of varying lengths. This was most striking in the unusual example, Kenny Wheeler's "Who Are You?," of a single set governing an entire tune, despite extensive chromaticism.

As the compositional practices of post-bop and modal jazz continued late into the 20th century, some composers continued to stretch the limits of what might be considered traditional. For instance, composers such as David Binney (see Chapter 5 in this dissertation) incorporate elements of "free" jazz into their music, so that the musicians are uninhibited by traditional "restraints"—including harmonic structure, form, and even meter—when improvising. Many contemporary composers, however, have stayed connected to the earlier practices by retaining recognizable chord structures and audible formal structures. In this chapter we will look at two more compositions by Wheeler. These are more chromatically complex than "Who Are You?," making the identification of referential sets more challenging. The prime goal of the discussion will be to show how continuity across non-conventional chord successions is conceivable with the theory of referential sets.

KENNY WHEELER'S "KIND FOLK"

Example 4.1 shows a lead sheet for the tune "Kind Folk," composed by Wheeler.[186] It first appeared on the album *Music for Large and Small Ensembles* (1990), as part of the *Sweet Time Suite*.[187] The tune was later rearranged and included on the album *Angel Song*, released in 1996. Described as "an album of celestial beauty that marks a late-career high point for Wheeler,"[188] *Angel Song* features Wheeler on trumpet and flugelhorn, Lee Konitz on alto sax, Bill Frisell on guitar, and Dave Holland on bass. This latter version serves as the principal source for the following analysis, but performances of "Kind Folk" are also featured on the albums *Still Waters* (1999), and *Lee Konitz and Kenny Wheeler Quartet: Live at Birdland Neuberg* (2000), the former being a duo recording with pianist Brian Dickinson.[189]

Example 4.1: Lead sheet for Kenny Wheeler's "Kind Folk"



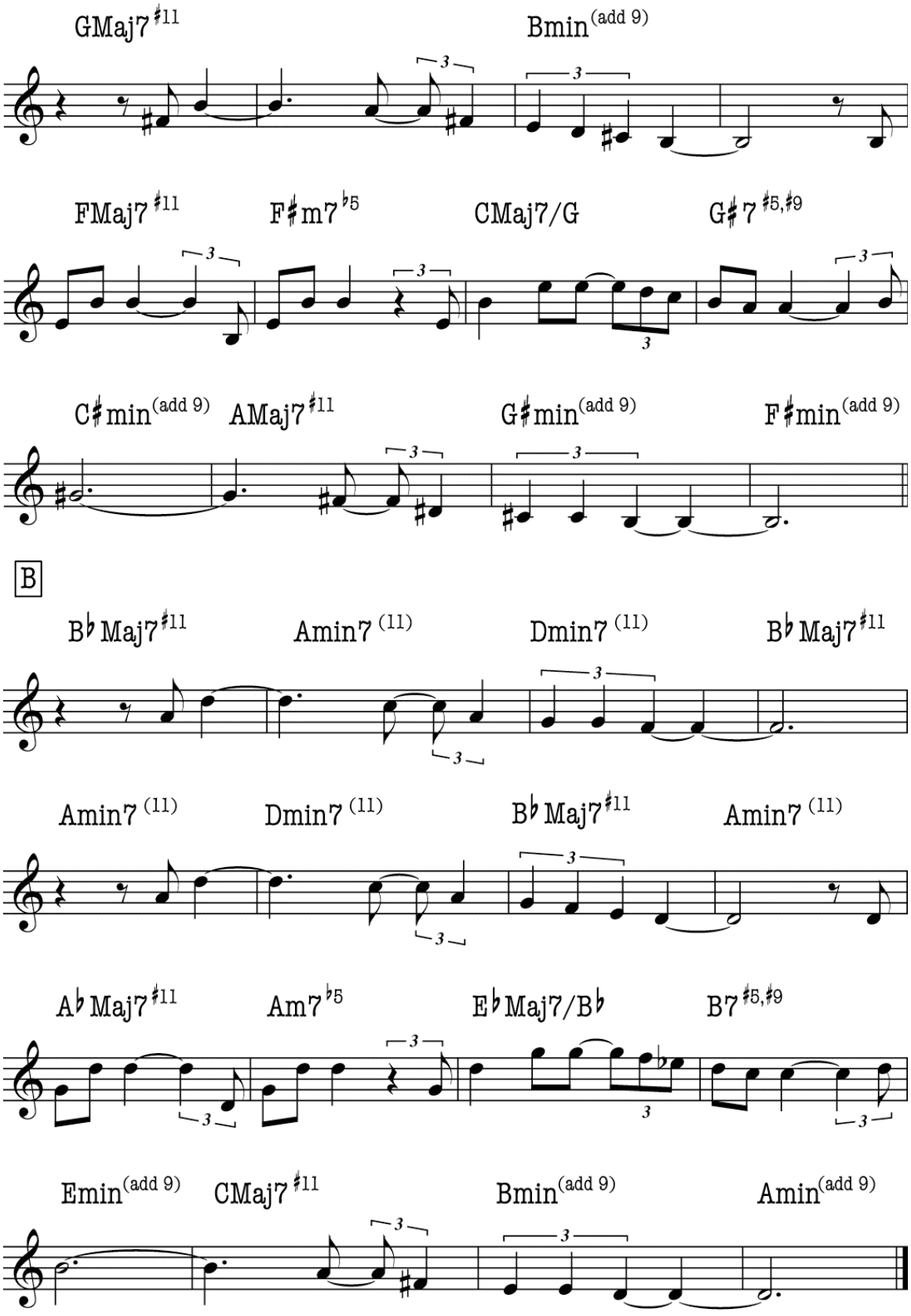
[186] Kenny Wheeler, "Kind Folk," composed by Kenny Wheeler, produced by Manfred Eicher (*Angel Song*, ECM Records, ECM 1607, 1996). The lead sheet in Example 4.1 is transcribed from a hand-written copy made by Wheeler.

[187] Kenny Wheeler, "Kind Folk" (*Music for Large and Small Ensembles*, ECM Records ECM 843152, 1990). Note that, on this album, "Kind Folk" is included as part of "Part 2 – For H. / Part 3 – For Jan" (track 2), and is performed in common time.

[188] Bradley Bambarger, "Wheeler's Luminous 'Angel,'" *Billboard - The International Newsweekly of Music, Video and Home Entertainment* 109/6 (8 February 1997), 1.

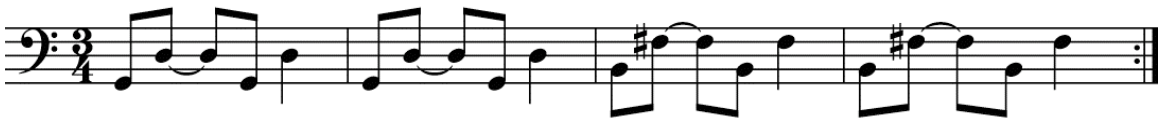
[189] Brian Dickinson and Kenny Wheeler, "Kind Folk," produced by Andrew Hurlbut (*Still Waters*, Hornblower HR99105, 1999); Lee Konitz and Kenny Wheeler, "Kind Folk," produced by Volker Dueck (*Live at Birdland Neuburg*, Double Moon Records DMCHR 71014, 2000).

Example 4.1: (continued)



Two out of the three post-1990 recordings mentioned above begin with a solo bass vamp not notated on the original lead sheet, a transcription of which is shown in Example 4.2.[190] The vamp consists of arpeggiated perfect fifths separated by a major third: $\langle G_2, D_3 \rangle \rightarrow \langle B_2, F\sharp_3 \rangle$. There are various ways that this vamp can be analyzed. For instance, one might understand an initial G-rooted chord moving to a second chord that has B as its root. This interpretation leaves the quality of the chords unknown since neither arpeggiation includes the chordal third. Alternatively, by grouping the dyads together into one chord—for instance, GMaj7—one could understand a single set to be governing the entire vamp, such as RS[G1] or RS[G4]. This interpretation would likely prioritize G, suggesting it as referential tonic.

Example 4.2: Opening bass vamp for "Kind Folk"



A third possible way of interpreting the opening vamp would be to consider each dyad as belonging to a different diatonic set, opening up the possibility of chord successions such as GMaj → BMaj or Gmin → Bmin. Exact transposition of chords, heard in successions such as these, would not be uncommon in contemporary jazz (or pop).[191] In the case of "Kind Folk," however, because of the limited information provided up to this point in the tune, and in adhering to Heuristic 1 (for a given timespan, prefer to identify only a single RS), my preference is to analyze the fifths as members of a single

[190] The *Still Waters* recording also includes a similar vamp, played on the piano, but with the chords filled in.

[191] Miles Davis's "So What" is such an example, and was described in Chapter 2 of this dissertation. The same succession of chords is used in John Coltrane's "Impressions" (J. Coltrane, on *Impressions*, Impulse AS-42, 1963). These types of chord-transformations can also be found in classical music, and are described by David Kopp in *Chromatic Transformations in Nineteenth-Century Music*, Cambridge University Press (2002).

set. Further, because G and B are distributed equally across the measures (both in terms of duration and harmonic rhythm), I'm inclined to hear a chord-root G progressing to a chord-root B. Collectively, therefore, I can hear the chord succession GMaj → Bmin, or some variation, implied by the vamp, and both chords generated by the same referential set. Because G is heard first, I am initially inclined to hear the governing set as RS[G1]. This is as opposed to, for instance, RS[B3], but this relative ambiguity between major and minor modes that share the same pcs reminds me of that observed in Wheeler's "Who Are You?."[192]

Excluding the vamp, "Kind Folk" is 32 measures long, with an A+B internal division of sixteen-plus-sixteen measures.[193] Various musical details within each section, such as changes of focal pitch, changes in harmonic rhythm, and, as we shall see, changes of referential set, result in shorter subdivisions. As well, the chord types are rather diverse throughout the tune, and rarely manifest any conventional relationships. What the following analysis will attempt to show, however, is how one set is featured most prominently, and that the particular arrangement of the referential sets used enables me to describe "Kind Folk" as governed by a single referential tonic.

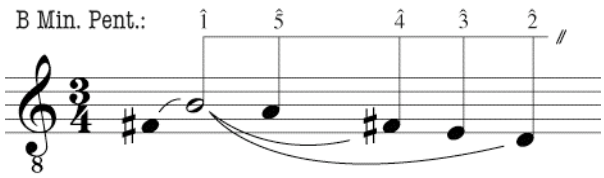
To determine the referential set, let us first consider how priority is established within the entire collection of pcs that make up the melody in mm. 1-8, (B, C♯, D, E, F♯, A). In mm. 1-4, shown in Example 4.3, priority is initially given to B as a result of the $F♯_4 \rightarrow B_4$ leap that initiates the melody, which can be heard as $\hat{5} \rightarrow \hat{1}$. The return of $F♯_4$, followed by a descent to D_4 enables me to hear a B minor triad arpeggiated across mm. 1-4; this is represented in the example using slurs. Because C♯ does not occur in the

[192] Recall that RS theory prefers diatonic collections (Heuristic 6).

[193] I will not include the opening vamp as part of the total number of measures, or when referencing measure numbers; thus, m. 1 will refer to the first measure on the original lead sheet, at the entrance of the melody.

melody until m. 7, one might hear mm. 1-4 as a "stepwise" descent through a B minor-pentatonic collection. The upper portion of the example, therefore, includes scale degrees that refer to members of this scale. Following from these observations, I hear B as the most structural melodic pitch, supporting RT[B]. Accordingly, Example 4.3 represents B_4 with an open notehead.

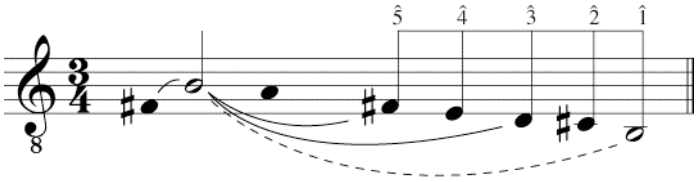
Example 4.3: Structural melody of mm. 1-4



Example 4.4 presents a reduction of the next four measures (mm. 5-8). Here, the descent to B_3 that was started in the tune's first four measures is completed. The broken line in the example shows that RT[B] is, essentially, prolonged across mm. 5-8, from B_4 → B_3, functioning as the single-most structural pitch class in the melody. Following Heuristic 6 (wherever possible, the RS should be diatonic), I hear the melody in mm. 1-8 as an incomplete diatonic scale, instead of an "expanded" pentatonic one.[194] The exact set is not clear since $\hat{6}$ is absent; it could be RS[B6] or RS[B2], depending on whether G♮ or G♯ is used. However, because G is included the underlying chord series of the opening eight measures, RS[B6] seems best as the governing referential set in these measures.

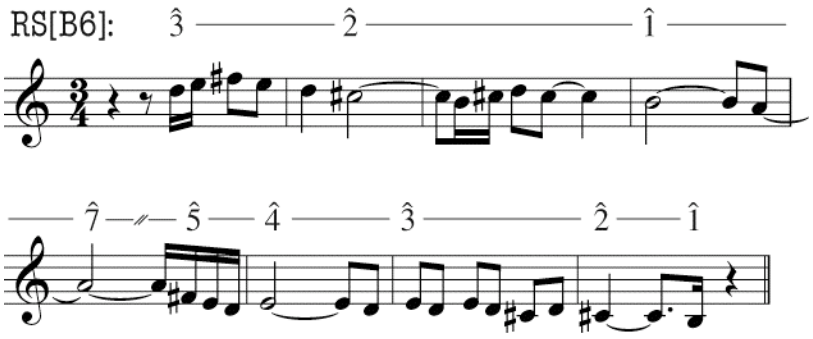
[194] Such expansion can be found in other contemporary jazz, such as that by pianist McCoy Tyner. Paul Rinzler notes how $\hat{2}$ was the most common expansion to the minor pentatonic scale in Tyner's vocabulary: <$\hat{1}$, $\hat{2}$, ♭$\hat{3}$, $\hat{4}$, $\hat{5}$, ♭$\hat{7}$>. The addition of this note enabled a greater number of quartal chords, such as <$\hat{2}$, $\hat{5}$, $\hat{1}$> and <$\hat{2}$, $\hat{5}$, $\hat{1}$, $\hat{4}$>. See Rinzler, "McCoy Tyner," 51.

Example 4.4: Structural melody of mm. 5-8



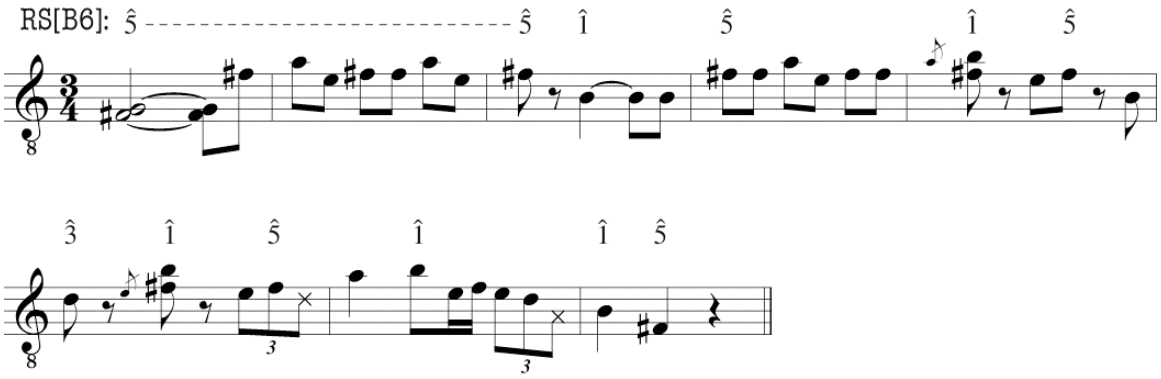
Indeed, RS[B6] is the basis for various improvisations on this tune, some of which are shown in Examples 4.5a-c. Example 4.5a is taken from Wheeler's solo, in which, just as in the tune's pre-composed melody, he includes all members of RS[B6] except $\hat{6}$. In Examples 4.5b and 4.5c, Frisell and Konitz both include $\hat{6}$ (m. 6), but exclude $\hat{2}$.[195] Thus, all three solos contain the B minor-pentatonic collection as a common subset, as is the case in the pre-composed melody, but interject one of the two remaining members of the governing RS. Further support for RS[B6] is shown in Example 4.5a since Wheeler, essentially, descends stepwise through almost the entire set, starting on D_5 ($\hat{3}$) and ending on B_3 ($\hat{1}$). Also, Examples 4.5b-c show that both Frisell and Konitz reinforce RT[B] by emphasizing members of the tonic triad throughout their improvisations.

Example 4.5a: Kenny Wheeler, solo on "Kind Folk" (mm. 1-8, 2:49-3:01)

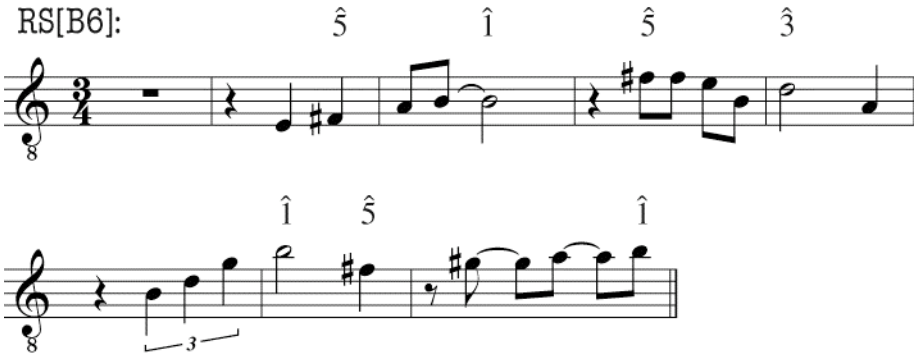


[195] Bill Frisell and Lee Konitz, "Kind Folk," composed by Kenny Wheeler, produced by Manfred Eicher (*Angel Song*, ECM Records, ECM 1607, 1996). I understand the $G\sharp_5$ in the final measure of Example 4.5c as a chromatically altered pitch that is functioning as an incomplete neighbor to the following A_5, and not as a member of RS[B2]. The motive, here, is an anacrusis to m. 9.

Example 4.5b: Bill Frisell, solo on "Kind Folk" (mm. 1-8, 1:08-1:21)



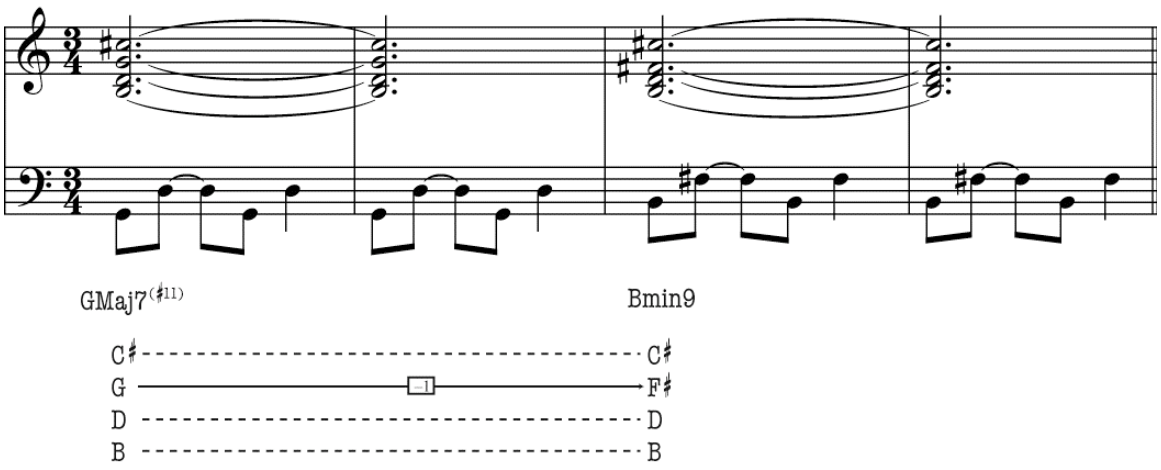
Example 4.5c: Lee Konitz, solo on "Kind Folk" (mm. 1-8, 4:28-4:40)



In conjunction with the melody's RT in mm. 1-8, the chord used in mm. 3-4, Bmin$^{(add9)}$, sounds like tonic. This, therefore, discounts the idea that B is subsidiary to G, as might be gathered from the opening vamp. In fact, I hear GMaj7$^{\sharp 11}$ functioning as a large-scale appoggiatura to Bmin$^{(add9)}$, an ornamental chord that encompasses the ultimately more focal Bmin$^{(add9)}$. Because almost all of the notes in GMaj7$^{\sharp 11}$ are common with Bmin$^{(add9)}$, linearity between the two events is expressed by the only unique pitch between the two chords, G♮. Given the present context, it could be possible to hear the relationship between G♮ (in GMaj7$^{\sharp 11}$) and F♯ (in Bmin$^{(add9)}$) as a $\flat\hat{6}\rightarrow\hat{5}$-motion that is

common in minor-mode compositions.[196] Accordingly, the upper staff in Example 4.6 shows one way that an accompanist might perform the progression, which maintains the aforementioned melodic motion, where G_4 moves down by semitone to $F\sharp_4$.[197] This hearing not only supports the idea of a static progression in mm. 1-8 in regards to harmonic function, but it completely eliminates the sense of any real harmonic change.

Example 4.6: Voice leading between $GMaj7^{\sharp 11}$ and Bmin9 (mm. 1-4)



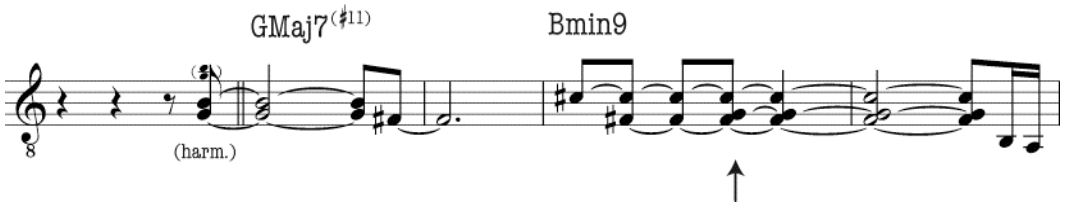
Common modal-jazz performance practice permits an accompanist to realize a given chord succession in various ways. For instance, Example 4.7 presents a transcribed excerpt from Bill Frisell's performance of the opening of the tune. Note how Frisell includes both the pitches F♯ and G on $Bmin^{(add9)}$ (highlighted by the arrow in the example). This realization contradicts the idea that G functions as an appoggiatura, and perhaps even suggests the retention of $GMaj7^{\sharp 11}$ from mm. 1-2 into the next two measures. This could also override RT[B] in favor of RT[G]. The melody's emphasis on B, however, enables me to retain my initial hearing and analyze the pitch G_3 in Frisell's

[196] In following the notated lead-sheet chords, where the bass supports G moving to B, this relationship occurs in pitch class space, or in an upper voice (as shown in Example 4.6).

[197] The example excludes the major 7^{th} (F♯) from the first chord in favor of a bijective voice leading. Because it is a common jazz practice to vary harmonic voicings when comping, the voicing given in the example is certainly possible.

performance as a non-specified chord tone—one that is nonetheless a member of the referential set governing the passage.[198] Therefore, I understand the opening 8 measures of "Kind Folk" to consist of a single B minor chord, with RS[B6] as the generating set. This follows from Heuristic 5, which states that the referential set should preferably include a clearly articulated tertian collection whose root is the RT. As we shall see, the prolonged emphasis on this single chord, as well as other factors discussed below, helps to prioritize B over other RTs that occur in "Kind Folk."

Example 4.7: Bill Frisell's performance of the opening of "Kind Folk" (~0:07-0:14)



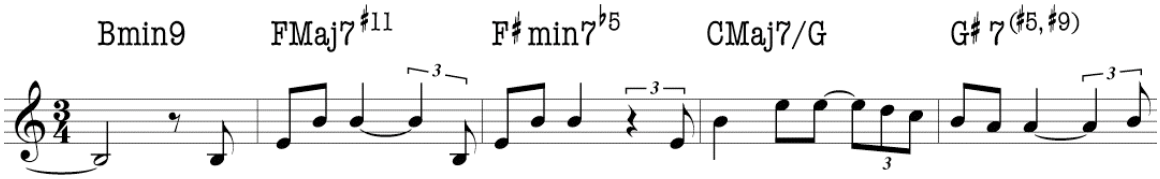
Significant change can be heard starting in m. 9; Example 4.8 shows mm. 8-12. Contrast is achieved in these measures by an increase in attack density in the melody and an accelerated harmonic rhythm, where chords now change at a rate of one per bar; these features support hearing mm. 9-12 as a type of "continuation" of the opening eight measures.[199] Change at m. 9 is also achieved by the chord, FMaj7$^{\sharp 11}$, which introduces

[198] Under the concept of inclusion, it could be possible for an accompanist to play any of the set-members when comping over mm. 3-4. Thus, in regards to Frisell's performance, I am designating G_3 as a non-*specified* chord tone as opposed to a non-chord tone. This note, which is the sixth over a B-rooted chord, is not specified in the chord symbol given on the lead sheet, but it is not analyzed as a performance error since it is a member of the governing referential set.

[199] William Caplin defines a continuation as "a medial intrathematic function that destabilizes the prevailing formal function by means of fragmentation, harmonic acceleration, faster surface rhythm, and harmonic sequence." It is in following this definition that I describe mm. 9-12 as a type of "continuation" of the opening eight measures. See Caplin, *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart, and Beethoven* (New York: Oxford University Press), 254.

two non-RS[B6] members: F and C. Because jazz tunes tend to be structured in phrase-lengths that have four as a common denominator (4, 8, 16, 32, as well as 12 (blues)), contrasting material beginning at m. 9 supports hearing m. 8 as a formal boundary and m. 9 as the start of a new phrase. Of course, because chord-root F♮ (m. 9) proceeds to chord-root F♯ in the next measure, one could argue that F♮ is an altered member of RS[B6] (perhaps a chromatic neighbor between the fifth of Bmin$^{(add9)}$ and the root of F♯min7$^{♭5}$). But because C♮ is retained across mm. 9-11, and because the bass's F♯ proceeds up to G, I hear the chord in m. 10 as the less stable one, and its root a less stable, chromatic passing tone between two stable notes.

Example 4.8: Transitional passage in A Section (mm. 8-12)



These changes support a shift of referential set at mm. 9-12. The initial perfect-fourth leap between B_3 and E_4 (mm. 8-9), reminds me of the leap between $F♯_4 \rightarrow B_4$ heard in m. 1. This leap could support RT[E] in mm. 9-12. The chords throughout these measures, however, do not substantiate this interpretation. A chord/scale interpretation of FMaj7$^{♯11}$ supports RS[F4], a set that is also supported by the chord in m. 11, CMaj7/G. However, because the most prominent melodic pitch in m. 9 is the sharp-eleventh—a dissonant note against the chord's root—my hearing of F as referential tonic is obscured. Despite this, the arrival of CMaj7 in m. 11 continues the white-note collection initially suggested by FMaj7$^{♯11}$. By prioritizing the chord in m. 11 over that in m. 9, I can understand the melody as comprising the guide tones (the third and seventh) of CMaj7. The retention of these important chord tones across a relatively chromatic succession of chords encourages a sense of continuity, and reminds me of Wheeler's "Who Are You?,"

in which he retains the root and fifth of the tonic, A minor, across a similarly chromatic passage (refer to Example 3.30 in the previous chapter). Further, the retention of pitch-class C across all four chords in the phrase helps to promote its significance. As a result, I hear, though perhaps somewhat retrospectively, RT[C] and RS[C1] as the tonic and corresponding set in mm. 9-12.[200]

Because I hear mm. 9-12 governed by RT[C], I understand the tonic has modulated up a semitone from RT[B] (mm. 1-8). The next change at m. 12, which continues the rising bass motion, will come (as the only Mm7 chord in this section) to tonicize C♯min$^{(add9)}$ in m. 13. However, until this chord resolves, I analyze it as a chromatically-altered member of RS[C1]. This is possible since the tonic chord, consisting of the root, third, and seventh, is sustained into the chromatic chord in m. 12 (3, ♯5, ♯9 = B♯, D♯♯, A♯♯ = C♮, E♮, B♮) and the melody notes in this measure (♯9, ♭9 = B♮, A♮) are both members of RS[C1]. As a result, I understand these apparently "altered" notes to actually make the measure less jarring and more consistent with the set that governs the group.[201] This interpretation will be justified by an improvisation by Wheeler discussed below (Example 4.10).

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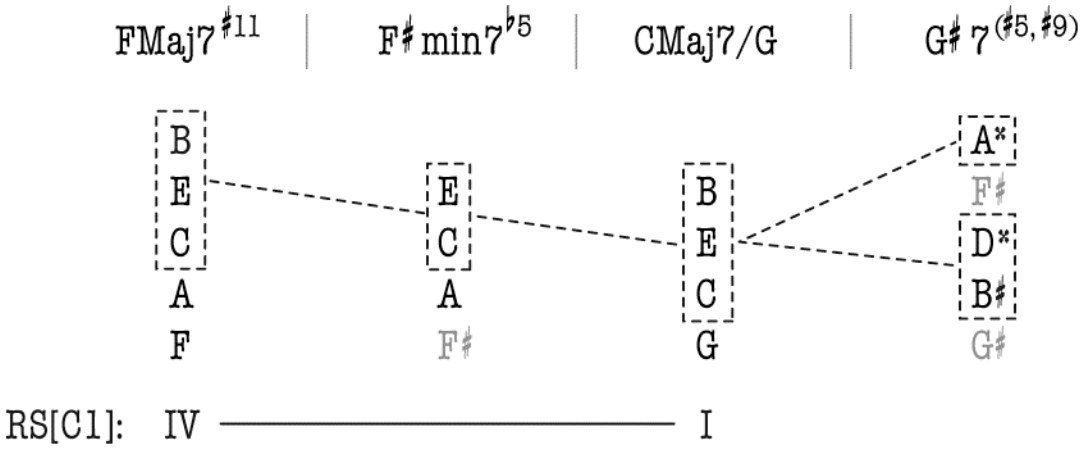
[200] Preferring C over F as tonic for the governing set adheres to Heuristic 5 (the RS should preferably include a clearly articulated tertian collections whose root is the RT), since the melody comprises C's guide tones (as opposed to the seventh and sharp-eleventh of F).

[201] This reminds me of m. 4 in Evans's "Very Early," where an A♭13$^{♭9}$ supports the melodic notes B♮ and A♮ in a predominantly white-key, RS[C1], environment. Similarly, G♯7$^{♯5,♯9}$ could be heard as a tritone substitute for D7, which would be V7/V in RS[C1]. In this case, as was presented in my analysis of "Who Are You?," non-RS members of the tritone substitute can be understood as semitone displacements of more stable RS members (Heuristic 3) to which they would traditionally resolve. Specifically, both G♯ and F♯, enharmonically reinterpreted as the root and seventh of A♭7$^{♯5,♯9}$, would be displacements of G♮—a member of RS[C1]. For further clarification, please refer back to Example 3.29 (Chapter 3).

To summarize the RS continuity I hear, Example 4.9 shows the pc-content of the chords from mm. 9-12. In this representation, non-members of RS[C1] are in grey type. Support for RT[C] is highlighted in the example with boxes, showing that the tonic chord, <C, E, B>, is present in all but one of the chords; the remaining chord contains the root and third, <C, E>. It is striking how, in m. 12, the referential tonic gets enharmonically reinterpreted as the leading tone to C♯, which, as will be shown, is the RT of the following phrase-group. Thus, this reinterpretation makes the semitone relationship between adjacent tonics explicit. In the lower portion of the example, Roman numerals are included in order to highlight my hearing of a plagal relationship between the two RS-chords in the phrase.

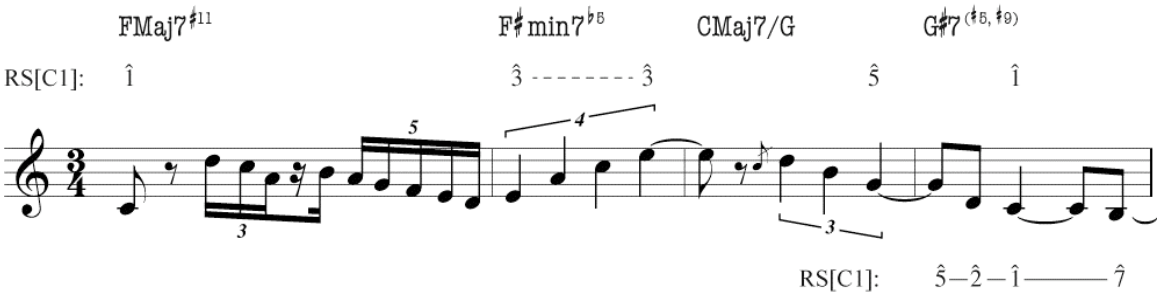
Example 4.9: RT[C]/RS[C1] supported across chord series of mm. 9-12



As support for conceiving of this passage in RS[C1], let us consider Wheeler's improvisation. Example 4.10 shows that in one chorus he uses exclusively "white key" pcs all the way, and emphasizes the root, third, and fifth of C major, making the music much more consistent with RS[C1] than with the chord being tonicized in m. 13. In m. 12, it appears that Wheeler's improvisational choices reflect and support the referential set that is most prominent at the given moment rather than directed towards any possible

subsequent sets. So, as mentioned above, until the G♯7$^{(♯5, ♯9)}$ chord in m. 12 resolves, it is possible to hear it as an altered subset of RS[C1].

Example 4.10: Kenny Wheeler, solo on "Kind Folk" (mm. 9-12, ~3:52-3:58)



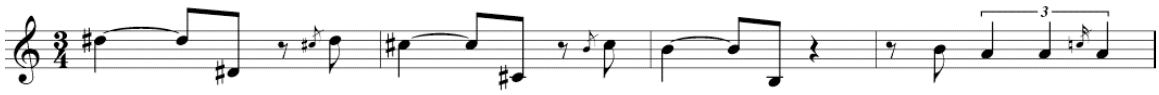
The melody of mm. 13-16 transposes mm. 1-4 down by a minor third[202]—an interval that will be reiterated in the tune's B Section.[203] As a result, the melody concludes in mm. 15-16 on B_3, the RT established in the tune's opening 8 measures. This transposition of referential tonic, as well as corresponding set, over mm. 13-16 is reflected in the improvisations of both Wheeler and Lee Konitz. Examples 4.11a-b show how both musicians maintain a collection that includes D♯ and G♯, not D♮ and G♮, as well as C♯ and F♯. Given the melodic transposition, one might think of this collection as RS[G♯3], but the resolution of G♯7 sets RT[C♯], making the corresponding set RS[C♯6].[204]

[202] The transpositional relationship corresponds to that between $G♯_4$ (m. 13) and B_4 (m. 1). The melody that begins in m. 13 excludes the perfect-fourth leap that initiates the opening melody.

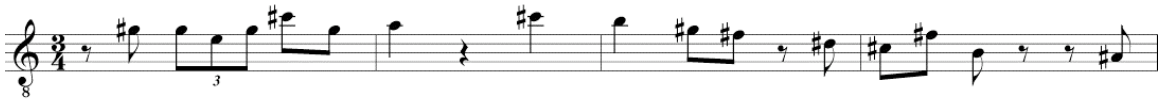
[203] The melodic transposition heard between mm. 1-4 and mm. 13-16 is a descending minor third; that which is heard between the A Section and the B Section is an ascending minor third. These third relationships also remind me of that heard in the opening vamp (albeit a minor third in the former cases, and a major third in the latter). Considering a strictly diatonic environment where all elements are considered in modulo 7, major and minor thirds belong to the same <0, 2> set class.

[204] The final eighth note in Konitz's solo can be analyzed as an anticipation of the RS in the succeeding measure (A♯ = B♭).

Example 4.11a: Kenny Wheeler, solo on "Kind Folk" (mm. 13-16, ~3:09-3:15)

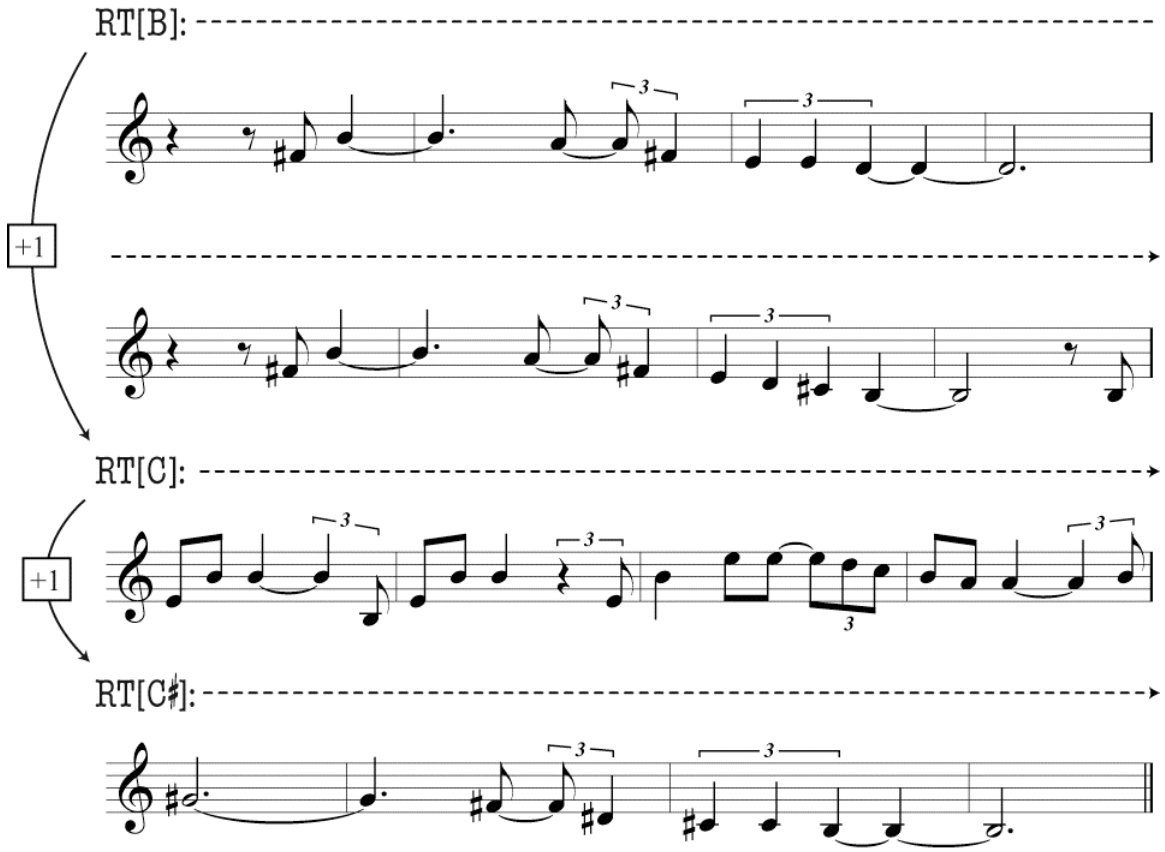


Example 4.11b: Lee Konitz, solo on "Kind Folk" (mm. 13-16, ~5:37-5:43)



The shift to RT[C♯] continues the +1-semitone tonic-transposition recently established between mm. 1-8 and mm. 9-12. As a result, I can understand the A Section of "Kind Folk" to be organized under the following RTs: [B] → [C] → [C♯]; this is represented in Example 4.12. Despite these shifts, however, an overarching continuity is achieved across the entire A Section. Specifically, B remains emphasized throughout the entirety of the first sixteen measures. This emphasis is most explicit in the opening eight measures. But in the melody of mm. 9-12, pc B is accented by leap, register, and duration, as well as by duration and contour in mm. 15-16. It also has structural prominence as the guide tone (seventh) of both of the A Section's subsequent RTs, [C] and [C♯].

Example 4.12: RT shifts in A Section of "Kind Folk"



The B Section of "Kind Folk" (mm. 17-32) transposes the A Section almost exactly. The melody *is* exactly transposed up a minor third, recalling the downward minor-third transposition of the opening melody that just occurred in mm. 13-16. However, the chords are not all transposed the same way. In mm. 17-24, rather than the expected B♭Maj7$^{\sharp 11}$ → Dmin$^{(add9)}$—a direct transposition of the chord series used in the opening eight measures—the lead sheet includes an additional chord. The resulting series, which opens the B Section, is B♭Maj7$^{\sharp 11}$ → Amin7$^{(11)}$ → Dmin7$^{(11)}$. Further, there is an acceleration of harmonic rhythm: what was one chord every two measures in mm. 1-8 is now one chord every measure. As a result, it becomes possible to cycle a three-chord series two and two-thirds times during the eight-measure melodic group. These chords include different extensions than those on which they are modeled. For instance,

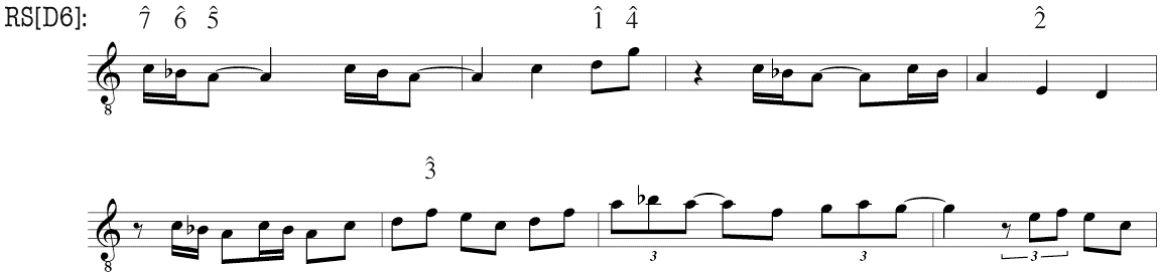
as opposed to the Bmin$^{(add9)}$ in the A Section, the corresponding Dmin chord includes the eleventh in the notation. Presumably this is included to account for the melodic G_4 in the third measure of the B Section (m. 19), but this fails as a justification since the eleventh also occurs over Bmin (E_4) in the A Section. Also, the lead sheet includes the seventh over Dmin (in m. 19) and omits the ninth that was specified in m. 3.

This root succession now includes motion by fifth, which helps to draw my ear towards D, as chord-root A proceeds to chord-root D. Following from the aforementioned transposition, and supported by this root succession, I hear RT[D] in mm. 17-24. The root succession between B♭Maj7$^{♯11}$ → Amin7$^{(11)}$ transfers the ♭$\hat{6}$→$\hat{5}$ melodic motion, initially suggested as an inner voice in mm. 1-8, to the bass, making it a more explicit part of the outer-voice structure. It further supports my hearing this motion in the opening measures. What is also noteworthy here is that, under the concept of inclusion (any melody or chord can be understood as belonging to the referential set if its pc members are included in the set that has been designated as referential), this interpolated chord does not disturb the identity of the referential set, since no non-RS members occur throughout the series. Example 4.13 shows the pc content of the 3-chord succession, and we can see that every member of RS[D6] is used. RS[D6] is also supported in Konitz's improvisation over the opening eight measures of Section B, as shown in Example 4.14. As is the case with the underlying chord succession, the scale degrees in the example show that every RS member is accounted for in Konitz's solo. As a result, I can understand the opening eight measures of each section to be governed by minor-third-related referential sets: RS[B6] and RS[D6], respectively.

Example 4.13: RS[D6] expressed across chord series used in mm. 17-24

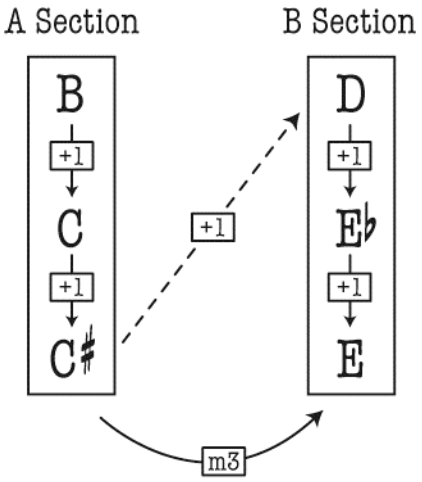
B♭Maj7♯11	Amin7(11)	Dmin7(11)
E	D	G
A	G	C
F	E	A
D	C	F
B♭	A	D

Example 4.14: Lee Konitz, solo on "Kind Folk" (mm. 17-24, ~4:53-5:06)



Despite the sudden shift produced by transposing mm. 1-8 in mm. 17-24, continuity is maintained in the specific sense that mm. 17-24's RT continues the semitone rise heard in mm. 1-16: [B] → [C] → [C♯] → [D]. Because the entire B Section is a transposition of the A Section, RT[E♭] follows RT[D] in the B Section's continuation phrase (mm. 25-28), which is then followed by the final RT of the tune, [E]. I can, therefore, understand an overarching organization of "Kind Folk" to be based on the following series of RTs: [B] → [C] → [C♯] → [D] → [E♭] → [E]. This series is represented in the transpositional network shown in Example 4.15. Each node in the network contains the RTs that govern the tune's respective sections. Within each node, the example shows the semitone rise between consecutive RTs (+1). The curved line connecting the two nodes depicts the minor-third relationship between the two sections of the tune (m3), while the broken diagonal line between the nodes shows that the semitone rise (+1) continues from the end of Section A into the beginning of Section B.

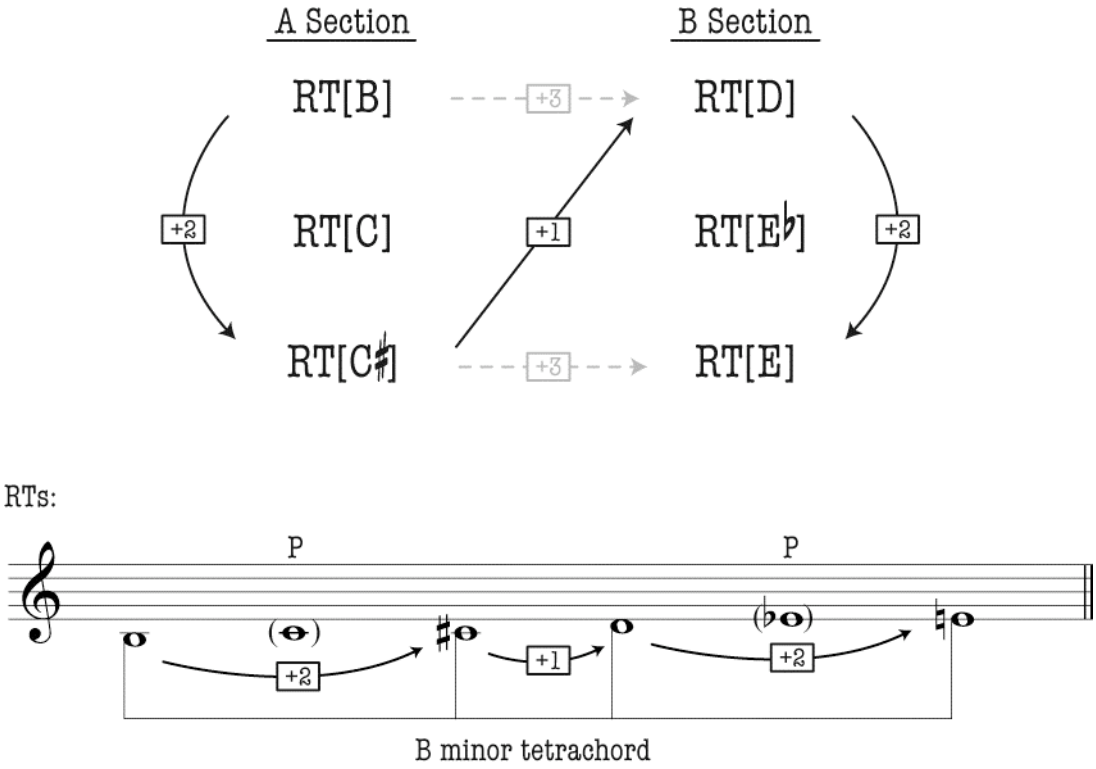
Example 4.15: Network representation of referential tonics governing "Kind Folk"



I also hear a pattern in the series of modes of the governing referential sets. Specifically, the minor-mode sets that border each section are interspersed with a major-mode set in the respective continuation phrases. Accordingly, I understand the major-mode RTs of the transitional passages to be less important than the minor-mode ones, functioning as large-scale chromatic passing formations. (That is, [B] and [C♯] are connected via [C], and [D] and [E] are connected via [E♭].) I therefore understand "Kind Folk," as a whole, to be organized according to a B minor tetrachord, which helps me to prioritize the tune's opening RT above all others. Example 4.16 diagrams this, showing how the RTs of the minor-mode sets share the same transpositional relationships as a minor tetrachord.[205]

[205] By minor tetrachord, I am referring to set-class (0235).

Example 4.16: Referential sets governing "Kind Folk;" referential tonics supporting B minor tetrachord

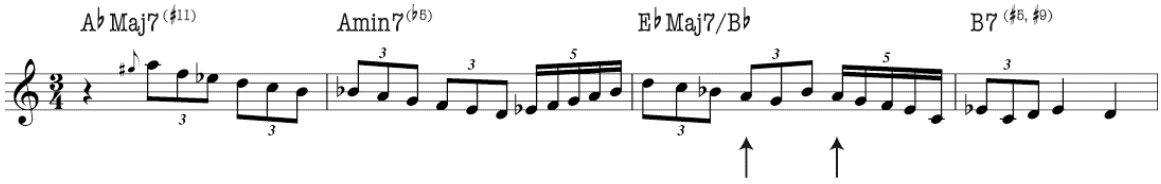


A final observation on the melody helps me to prioritize the members of RS[B6]. Because of the direct melodic transposition in the first and last phrases in each section, where the melody in mm. 13-16 is a transposition of the melody in mm. 1-4 and the melody in mm. 29-32 is a transposition of that in mm. 17-20, I associate those measures. Moreover, because the melody in mm. 17-32 is transposed a minor third up from mm. 1-16, and since mm. 13-16 are transposed down a minor third from mm. 1-4, then, melodically, the last four measures (mm. 29-32) equals the first four (mm. 1-4). As a result, I can hear the RS of the final four measures to be RS[E2], which supports RT[E], but is a rotation of RS[B6]. This, therefore, helps me to retain B as the tune's overarching tonic, despite the different chords.

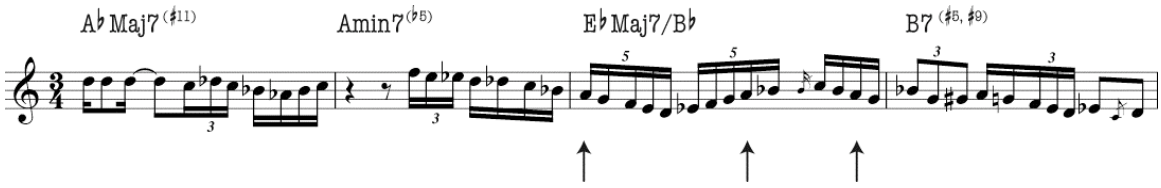
Understanding how the members of RS[B6] govern the whole tune helps to explain an interesting inconsistency between Wheeler's solos on the two continuation phrases, mm. 9-12 and mm. 25-28. In the A Section, I showed above how Wheeler's solo

draws from RS[C1]. In the continuation phrase of the B Section, however, he draws from RS[E♭4], and not RS[E♭1]. This inconsistency might follow from conventional jazz practices, in which a major tonic chord takes a raised eleventh in order to avoid the minor ninth that would otherwise occur between the third and the natural eleventh.[206] However, the inconsistency can alternately be understood as the result of Wheeler staying connected to the surrounding referential sets within the tune. That is, by retaining the pc A♮ ($\hat{4}$ in RS[E♭4]) in his solo over mm. 25-28, rather than A♭ ($\hat{4}$ in RS[E♭1]), Wheeler keeps his solo more closely related to the surrounding collections by altering only those pcs that are absolutely necessary for clarifying the tonic of the local referential set, RT[E♭].[207] Examples 4.17a-b show Wheeler's solo over the B Section's continuation phrases in both choruses. Note how he includes A♮ specifically over the E♭ chord, as opposed to in the second measure, where one could argue that A♮ reflects the chromatic passing tone in the bass.

Example 4.17a: Kenny Wheeler, solo on "Kind Folk" (mm. 25-28, ~3:26-3:32)



Example 4.17b: Kenny Wheeler, solo on "Kind Folk" (mm. 25-28, ~4:15-4:21)

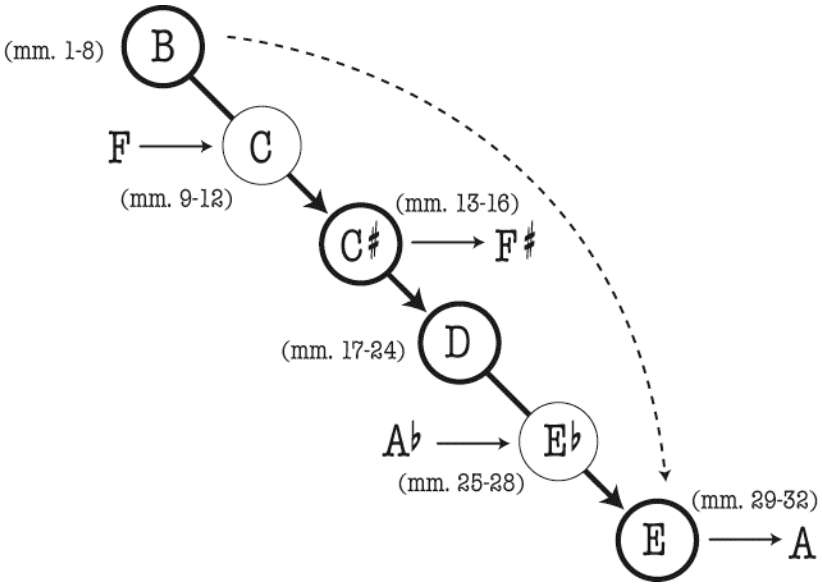


[206] See, for instance, Burbat, *Jazz Harmony*, 8.

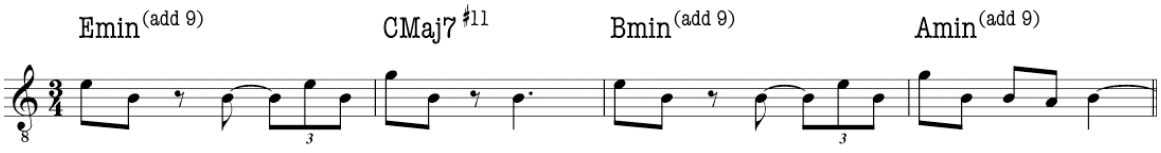
[207] This would follow from Heuristic 3 (every pc that does not belong to the RS can be understood as an alteration of a pc in the RS).

When the chorus is repeated in performance, the return to RT[B] at the top from RT[E] at the end emphasizes the perfect fourth that was heard initially in the melody of the continuation phrase. A preference for perfect-fourth, or plagal, relationships heard at other points throughout the tune also supports this global relationship between RT[E] and RT[B]: each of the secondary passages emphasizes a harmonic relationship of a perfect fourth between chord-roots, as shown in Example 4.18. In the example, bold nodes enclose those RTs that are part of the minor tetrachord. Perfect fourths in specific passages are represented by the chord-root to the left or right of the corresponding node. Konitz also emphasizes this particular relationship in the final four measures of his solo, shown in Example 4.19.

Example 4.18: Fourth relationships in "Kind Folk"



Example 4.19: Lee Konitz, solo on "Kind Folk" (mm.29-32, ~6:01-6:07)



Final support for RT[B] comes at the end of the tune. Each of the three recordings noted at the start of this analysis conclude with a return to the opening vamp. All three vamps are prolonged over multiple measures, and all three end on the second of the two dyads, <B, F♯>, which I now understand as the root and fifth of the referential tonic chord.

The preceding analysis shows how we can describe Kenny Wheeler's "Kind Folk" as being organized around a B-tonic referential set. Continuity is achieved across the tune by the referential tonics that spell out a B-minor tetrachord. Plagal relationships that occur in each of the tune's subphrases encourage me to understand the motion from RT[E] → RT[B], which occurs when the chorus is repeated, as further supporting B as the tune's most prevalent RT, while examples of specific voice leading and various improvisations support the individual referential sets that make up the tune's more local levels.

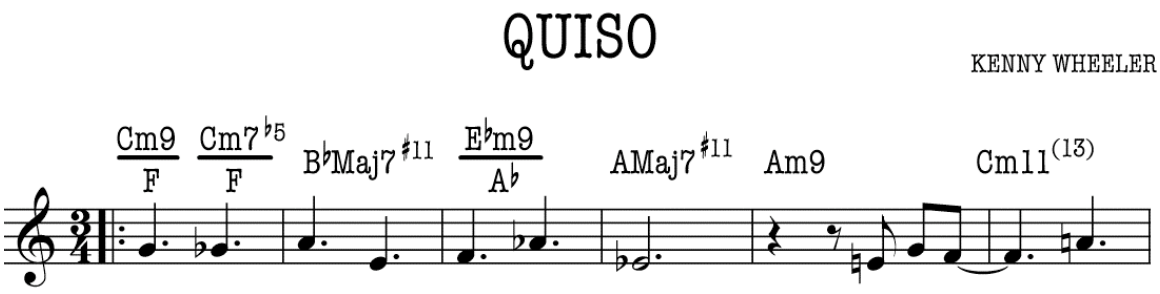
KENNY WHEELER'S "QUISO"

The level of chromaticism that is exhibited in both "Who Are You?" (Chapter 3) and "Kind Folk" is a characteristic feature of Wheeler's compositional style. More specifically, it is critical component of his harmonic vocabulary. What both of these tunes have in common, however, are relatively diatonic melodies. In "Who Are You?," Wheeler used chromatic harmonies to support a melody that is entirely diatonic. In "Kind Folk," extended passages, described as subphrases within the tune, were restricted to a limited number of pcs, which helped to prioritize particular diatonic sets within these subphrases. Wheeler's melodies, however, are not always organized in such ways. Like his chord successions, they are sometimes highly chromatic, and this can make pc prioritization more challenging.

Two decades prior to the release of *Angel Song*, Wheeler released the album *1976*.[208] This is a live studio take, recorded for the Canadian Broadcasting Corporation, and features Wheeler on trumpet, Art Ellefson on tenor sax, Gary Williamson on Fender Rhodes, Dave Young on bass, and Marty Morrell on drums.

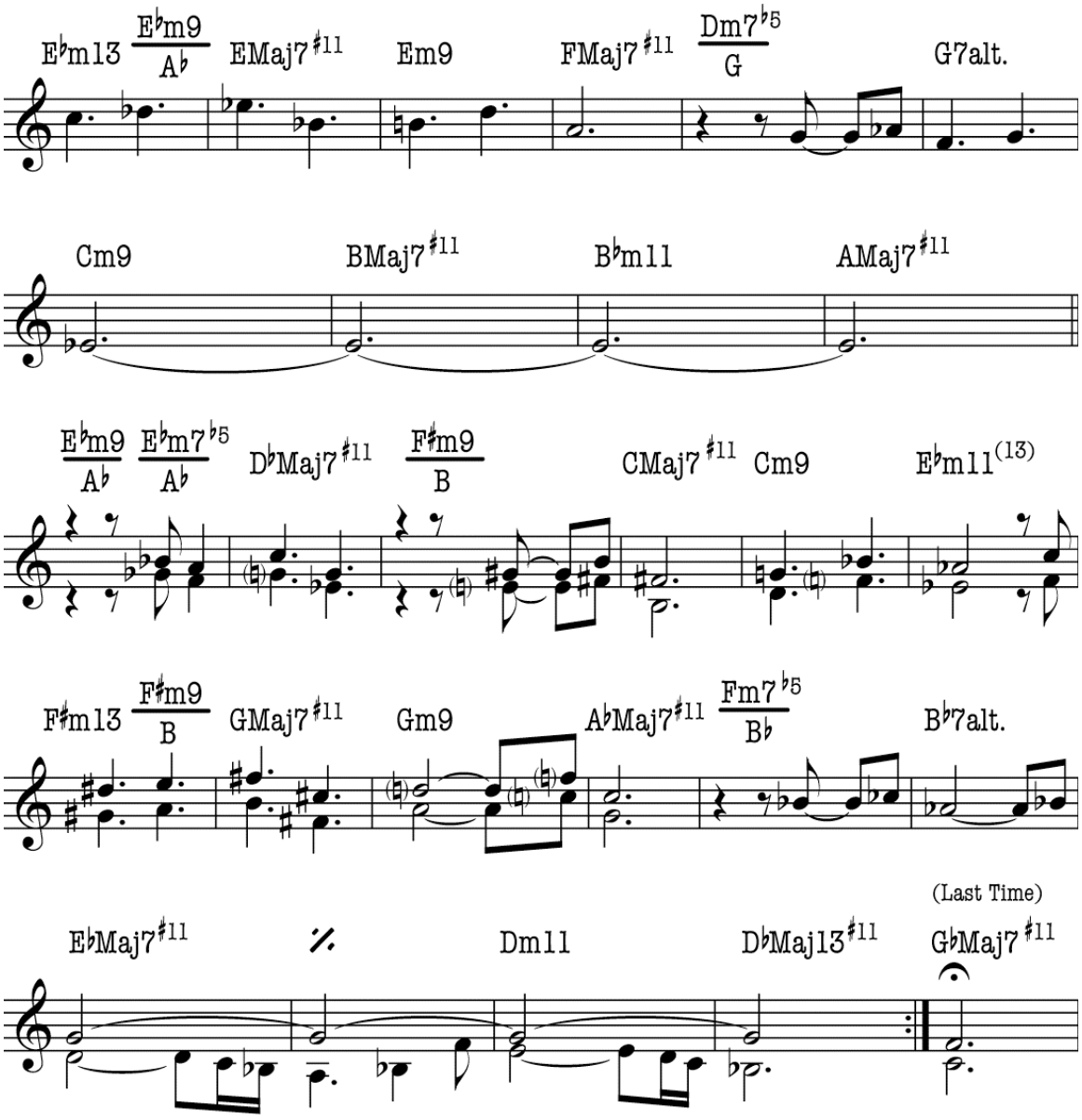
"Quiso," the third track on *1976*, shares distinct similarities with "Kind Folk." (Example 4.20 shows a lead sheet for it.[209]) Both are thirty-two-measure, triple-meter tunes, composed of two parallel sixteen-measure subphrases, the second sixteen measures an ascending minor-third transposition of the first. For consistency's sake, I will refer to mm. 1-16 as the A Section, and mm. 17-32 as the B Section.[210] In contrast to "Kind Folk," however, the B Section of "Quiso" includes a notated voice below the principal melody.[211] Also, there are slight variations in the transposed melody's rhythm (compare mm. 17, 19, 21-22, 25, and 28 with their parallel measures in the A Section), and the harmonies in the final four measures of the tune are not exactly transposed.

Example 4.20: Lead sheet for Kenny Wheeler's "Quiso" (*1976*, 1976)



[208] The Kenny Wheeler Quintet, "Quiso," composed by Kenny Wheeler, producer unknown (*1976*, Just a Memory Records JAS 9506-2, 1976).
[209] The lead sheet in Example 4.20 is transcribed from a handwritten copy made by Wheeler.
[210] The lead sheet for "Quiso" does not indicate different sections, but this division is clear in the music.
[211] Performances of "Kind Folk" tend to also include a second part in the tune's B section (instrumentation permitting), but it is not included on the lead sheet.

Example 4.20: (continued)



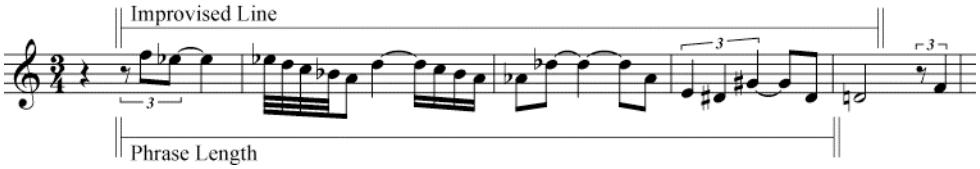
Since "Quiso" is much more chromatic and harmonically active than "Kind Folk," its pitch-content is also more complex. In "Quiso," few adjacent chords belong to the same diatonic set. Further, the melody cannot easily be organized into any single diatonic collection. For instance, the melody in the first four measures of the tune comprises a non-diatonic heptachord, and the complete aggregate is completed by m. 9. Features such

as these make prioritizing a single referential set that extends over multiple measures much more difficult than in "Kind Folk." Nonetheless, the following analysis will attempt to show how "Quiso" prioritizes two successive referential tonics. One of these will be shown to be most prominent because its RS members are featured at significant moments within the tune.

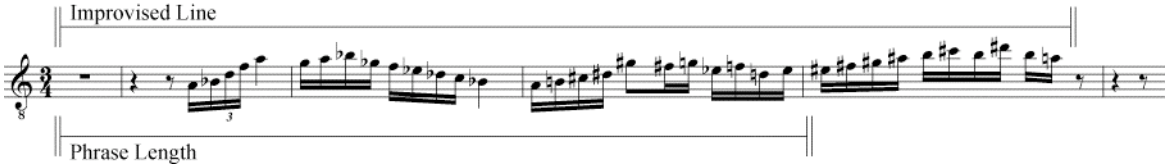
A productive RS approach to this tune begins with focusing on its grouping structure, consistent with Heuristic 4, which prefers referential sets to occupy entire groups. The internal sixteen-measure division in "Quiso" is relatively easy to hear. Phrase boundaries within each of the two sections are, however, slightly more difficult to distinguish. The melodic rhythm begins with continuous dotted-quarter notes that do not cease until m. 4, with a durational accent on $E\flat_4$. This momentary break in the repetitive rhythm marks it for me as the end of the first phrase—a hearing that is further encouraged by the rest in m. 5. Thereafter, boundaries become less clear. Influenced by the transpositional relationship (perfect fifth) between the chords in mm. 4 and 8 ($AMaj7^{\sharp 11}$ and $EMaj7^{\sharp 11}$ respectively), one could hear the next four measures as Phrase 2. However, this grouping is contradicted by the melody's rhythm, which continues through m. 8 only to break in m. 10 with a durational accent on A_4. There are other ambiguities, too, that are apparent in how the musicians improvise on this passage. Examples 4.21a-b show the openings of Kenny Wheeler's and Art Ellefson's improvisations.[212] Both performers play through the end of Phrase 1 (m. 4), as shown by the different line lengths above and below the staves, but both provide a clear point of repose in m. 5, further contradicting the suggestion that a new phrase begins in this measure.

[212] Kenny Wheeler and Art Ellefson, "Quiso," composed by Kenny Wheeler, producer unknown (*1976*, Just a Memory Records JAS 9506-2, 1976).

Example 4.21a: Kenny Wheeler's solo, "Quiso" (mm. 1-5, ~2:50-2:58)

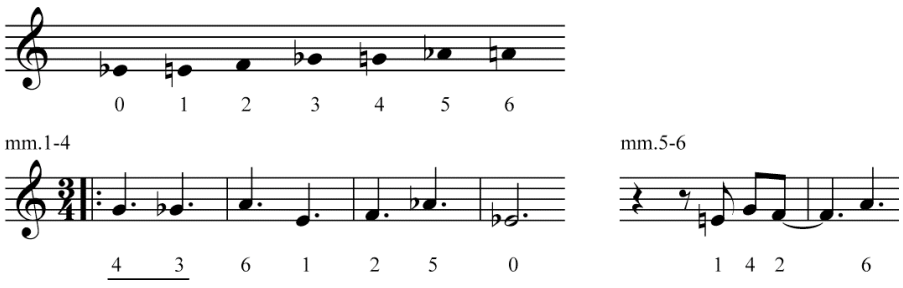


Example 4.21b: Art Ellefson's solo, "Quiso" (mm. 1-5, ~3:45-3:53)



Furthermore, the parallelism between mm. 1-4 and mm. 7-10 creates a stronger sense of beginning at m. 7 than at m. 5, and this leads me to hear mm. 5-6 as part of the first phrase rather than the second. The parallel rhythm between mm. 1-4 and mm. 7-10 supports this hearing: three measures of consistent dotted-quarter notes followed by one measure of a dotted-half. Phrase boundaries are also articulated by pitch content. More specifically, the melody in mm. 1-4 forms a chromatic heptachord starting on E♭, as shown in Example 4.22. For clarity, the upper staff in the example orders the pitches from lowest to highest and labels them using integers 0-6. In the lower staff, the pitches are reordered according to their temporal position in the melody. In the right-hand side of the example, we can see that the melodic pitches in mm. 5-6 are repeated members of the heptachord, and so I hear continuity across mm. 1-6 despite the intervening silence at the opening of m. 5.

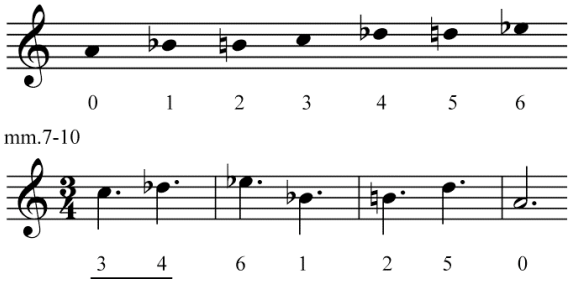
Example 4.22: Chromatic heptachord formed by melody in Phrase 1 (mm. 1-4) + restated pitches (mm. 5-6)



A chromatic heptachord can also be constructed from the pitches in mm. 7-10, starting on A. As in the previous example, the upper staff in Example 4.23 presents the pitch content registrally, from lowest to highest, and its temporal ordering is given on the lower staff. The only difference between the temporal ordering in these two phrases occurs at their onset: the first two pitches are reversed, so that all but these uphold a +6-semitone transposition of the melody in mm. 1-4 (underlined in both Example 4.22 and 4.23). More specifically, Phrase 1 orders its heptachord <*4, 3*, 6, 1, 2, 5, 0>, while the ordering of Phrase 2 is <*3, 4*, 6, 1, 2, 5, 0>. Despite this change, mm. 1-4 and mm. 7-10 can be understood as being related by both parallel rhythm and transpositionally related pitch content, resulting in Phrase 1 and Phrase 2 respectively. The remaining measures of Section A (mm. 11-16) return to pitches from the heptachord identified in mm. 1-4, and conclude with a strong durational accent on E♭$_4$ (mm. 13-16), the same pitch that ended Phrase 1. So one way to organize the chromatic melody in the A Section of "Quiso" could be according to these two heptachords, one built on E♭ (Hept E♭) and one built on A (Hept A), as shown in Example 4.24. Accordingly, I could posit that the section is governed by RT[E♭] and RT[A]. However, since no major or minor triad can be built with either or these heptachords, I find it difficult to justify these chromatic sets as completely referential.[213] Further, designating these heptachords as referential conflicts with Heuristic 6, which prefers diatonic sets.

[213] Heuristic 5 states that the RS should preferably include a clearly articulated tertian collection whose root is the RT. In each heptachord, one could possibly hear the "tonic" chord as diminished. But since neither E♭-diminished nor A-diminished are used in the tune, I find this hearing unlikely.

Example 4.23: Chromatic heptachord formed by melody in Phrase 2 (mm. 7-10)



Example 4.24: Melodic pitch organization in Section 1 of "Quiso"

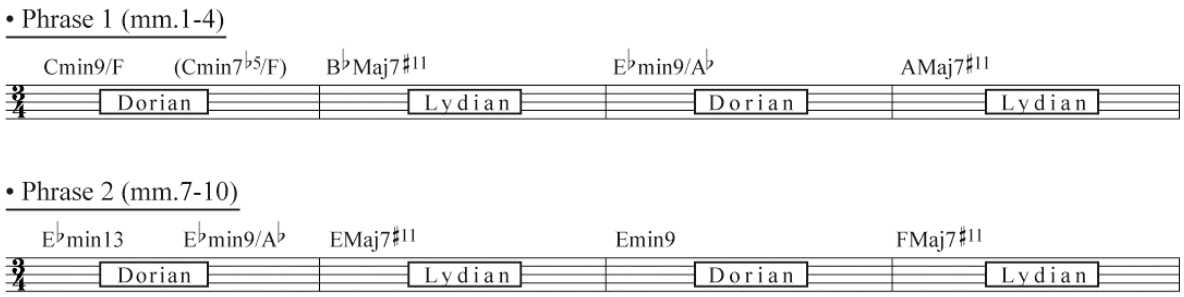
Hept E♭ • Mm. 1-6	Hept A • Mm. 7-10	Hept E♭ • Mm. 11-16

Like the melody, the series of chords used in "Quiso" offers few clues regarding grouping. As noted earlier, no two successive chords belong to the same diatonic set. Also, the melody's harmonization is not traditional since the melody often uses the upper extensions of the underlying chords, such as the ninth, eleventh, or thirteenth. In regards to parallelism between phrases, the chords do not support the relationship observed in the melody, since only one of the chords in Phrase 2 is a tritone transposition of its parallel chord in Phrase 1 (m. 2 = B♭Maj7$^{\sharp 11}$, m. 8 = EMaj7$^{\sharp 11}$).

In cases such as this, it might be worthwhile to explore the non-traditional chord successions with traditional chord/scale theory, because recurring patterns in the modes associated with the chord series might suggest some form of large-scale pitch organization. In some cases, there is a one-to-one relationship between a chordal extension and a mode (e.g., min13 = Dorian). Other chords are more ambiguous, however. For example, the Cmin9/F and E♭min9/A♭ in mm. 1 and 3 of "Quiso" could suggest either Dorian or Aeolian. But because both of these chords essentially return at later points in the succession with an added thirteenth (Cmin11$^{(13)}$ in m. 6 and E♭min13 in m. 7), I can understand each to be subsets of the Dorian mode. Also, Maj7$^{\sharp 11}$ suggests the Lydian mode, and we can see that both Phrase 1 and Phrase 2 use this chord type in their

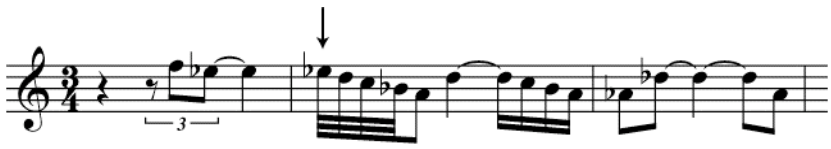
respective second and fourth measures. Therefore, by momentarily ignoring the chord in the second half of m. 1 (for a reason to be discussed below), it would appear that both phrases alternate Dorian and Lydian modes, as shown in Example 4.25.[214]

Example 4.25: Modal organization of Phrases 1 and 2



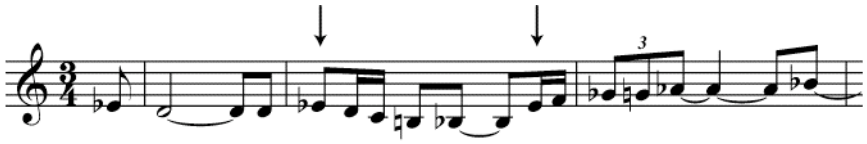
One problem with applying a chord/scale analysis to "Quiso," however, is that these modes are not entirely supported in the recorded improvisations. Examples 4.26a-c show how none of the performers includes E♮ in their solo over the second measure, whereas both Wheeler and Williamson include E♭ (highlighted by the arrow). So they do not manifest the change to Lydian that is posited by Example 4.25. The question, therefore, remains: do large-scale relationships exist in "Quiso"? And, if so, how can a theory of referential sets describe such relationships?

Example 4.26a: Kenny Wheeler's solo on "Quiso" (mm. 1-3, ~2:50-2:56)

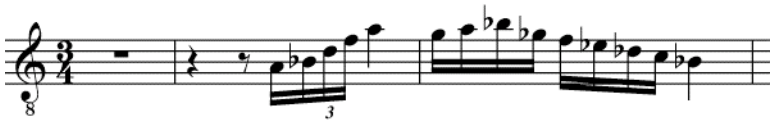


[214] Of course, Emin9 could suggest either Dorian or Aeolian. However, because it is more common for jazz improvisers to use the Dorian mode when playing over minor chords, I feel comfortable specifying this mode here, which supports the consistent alternation within each phrase.

Example 4.26b: Gary Williamson's solo on "Quiso" (mm. 1-3, ~1:56-2:00)[215]



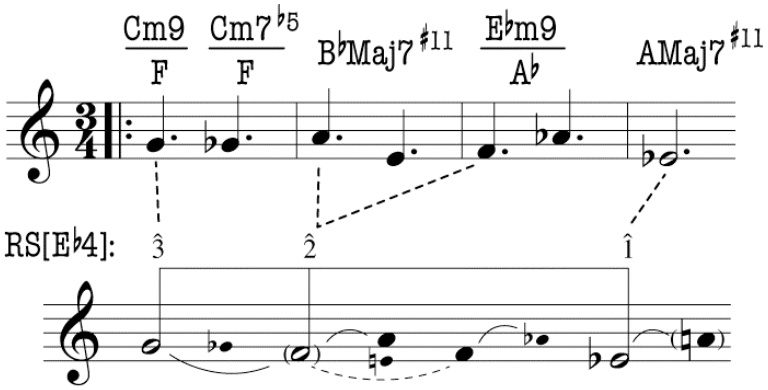
Example 4.26c: Art Ellefson's solo on "Quiso" (mm. 1-3, ~3:45-3:50)



Given the durational accent at the end of Phrase 1, the opening Hept E♭ group can be shown to support a diatonic hearing of the melody, specifically RS[E♭4]. The lower portion of Example 4.27 shows the structural melody of the opening phrase as I hear it. The melody's starting pitch, G_4, connects to the accented $E♭_4$ (m. 4) via a stepwise descent across these measures, from $\hat{3} \rightarrow \hat{1}$ in RS[E♭4]. $\hat{3}$ connects to $\hat{2}$ through a chromatic passing tone, $G♭_4$, and I hear $\hat{2}$ beginning in the second measure (placed in parentheses in the structural melody, representing its implied status). Following this, I hear E_4 in m. 2 as a chromatically altered neighbor to $\hat{2}$; the example represents both the chromatically altered $G♭_4$ and $E♮_4$ with smaller noteheads.

[215] Gary Williamson, "Quiso," composed by Kenny Wheeler, producer unknown (*1976*, Just a Memory Records JAS 9506-2, 1976).

Example 4.27: Structural melody of Phrase 1 (mm.1-4)



Hearing G♭$_4$ as a passing tone enables me to discount any real harmonic change occurring in the second half of m. 1 (Cmin7$^{♭5}$/F); instead, I hear simply a continuation of a single chord (Cmin9/F) that has a chromatically altered pitch. This is similarly the case in m. 2, where the sharp eleventh included in the chord (E♮) is a linear melodic event, pointing towards a more structural pitch, F$_4$, in m. 3. Accordingly, I hear the chord in m. 2 as a subset of RS[E♭4], but containing a temporarily altered pitch. This hearing helps explain the modal discrepancy that was noted in regards to the improvisations shown earlier, in Examples 4.26a-c. The fact that none of the performers includes E♮ in their improvisations, and two of them include E♭, supports the possibility that they are retaining a single collection across mm. 1-2.

Returning to the melody, I hear the notated pitches in the melody of m. 2, as well as those in m. 3, as chordal skips between members of the underlying chords. These skips are represented in the example by the slurs between corresponding notes. By verticalizing these skips, I can understand the melody's A♭$_4$ as a chromatic neighbor to A ($\hat{4}$ in RS[E♭4]). Accordingly, Example 4.27 represents A♭$_4$ using a smaller notehead, and shows an implied A♮$_4$ connected to the structural E♭$_4$; the actual resolution from A♭ back to A occurs in the bass. It is precisely because the bass note in m. 4, as well as the melodic motion just mentioned that I am preferring A♮ over A♭ as RS-member.

Analyzing the melody in this way helps to support my preference for RS[E♭4] throughout Phrase 1.

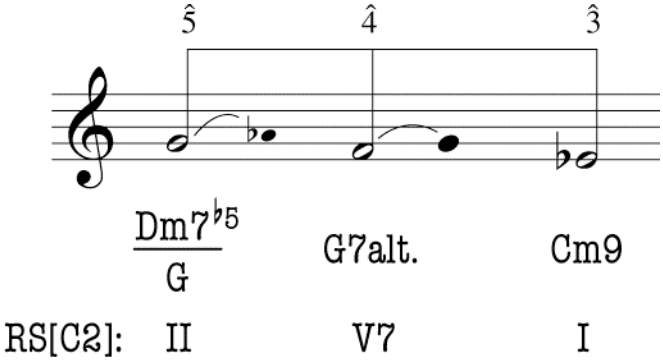
The melody of the second Hept E♭ group in mm. 11-13 restates the same linear descent identified in the opening phrase of "Quiso." Specifically, I recognize the same motion from $\hat{3} \rightarrow \hat{1}$ in RS[E♭4], with both $\hat{3}$ and $\hat{2}$ now ornamented by incomplete upper neighbors. Because referential set members extend to both the melodic and harmonic dimensions concurrently, the importance of a pc, and thus its membership in a referential set, does not necessarily derive from harmonic or contrapuntal support. However, the synchronization of a structural melodic note with a referential harmony—a harmonic event that is comprised exclusively of referential set members—will help to make the referential set more explicit. Therefore, because $\hat{3}$ in m. 13 is supported harmonically by Cmin9, this signals an important event.

In Chapter 2, I stated that the analytical focus of this dissertation will be on tunes in which standard functional progressions are rare. As a result of this rarity, however, any functional progression found in the tunes being considered will receive special attention, since it will likely have a specific bearing on the identification of a referential tonic and its associated set. Despite the relentless chromaticism in both the melody and harmony of "Quiso," the tune includes a clear cadential progression beginning in m. 11: Dmin7♭5 → G7alt → Cmin9. As shown in Example 4.28, this progression prioritizes C minor and, therefore, presents the possibility of RT[C]. Moreover, I can analyze the linear descent in these measures as $\hat{5} \rightarrow \hat{3}$ over RT[C] instead of $\hat{3} \rightarrow \hat{1}$ over RT[E♭].[216] Accordingly, one might assume that the governing set in these measures is RS[C2], since it is a rotation of

[216] Alternatively, when considering my hearing of the melody in Phrase 1, this moment could represent a deceptive resolution in E♭. However, given the emphasis on C that results from the progression (an emphasis that was not given to E♭), my hearing is guided towards RT[C].

the set that was posited in Phrase 1. But there is a discrepancy here, which results from pc A♭, heard in both the melody as well as the underlying Dmin7♭5. Despite this discrepancy, however, I prefer A♮ on account of the bass line in the opening phrase (as well as at other moments, to be discussed shortly), and so I analyze A♭ as an altered pitch in an otherwise-governing RS[C2].[217] Thus, Example 4.28 represents this pitch with a smaller notehead.

Example 4.28: Cadential progression supporting RT[C]/RS[C2] (mm. 11-13)



Following m. 13, the chords in the remainder of the A Section do not remain diatonic. However, the prolongation of the structural melodic pitch, E♭4 (mm. 13-16), combined with the functional progression that precedes it, helps me to hear m. 13 as the structural goal of the section, and mm. 14-16 as a post-cadential extension (this will be discussed in more detail below).

The significance of the cadential progression described above, as well as the chords that follow it, is great since it helps me to re-contextualize the opening measures of "Quiso." As noted in Chapter 2 (footnote 21), standard jazz practice identifies a slash

[217] The progression IImin7♭5 → V7alt is a common cadential progression in minor mode. It is not uncommon to use the Dorian mode when playing over minor chords, even if those are analyzed as tonic. This traditional approach to improvising over this progression would, therefore, present the same discrepancy between ♭6 and ♮6 over a given tonic. As a result, I am not deterred by the ♭6 in the half-diminished predominant chord, since I can hear the ♮6 over the tonic.

chord as a harmonic structure over which a non-chord member is played in the bass. Following this definition, the F in the bass of Cmin9/F in m. 1 is a non-chord tone.[218] Therefore, taking a standard jazz reading, the notated chord in m. 1 identifies C as the actual root, just as E♭ is identified as the root of the chord in m. 3. Accordingly, I can retrospectively understand the chord in m. 1 to be a tonic chord, or I in RS[C2]. Example 4.29 recreates Example 4.27, but modifies the scale degrees of the linear descent to accommodate RS[C2], and includes a bass line and Roman numerals. By analyzing the chord in m. 1 as a I chord, the example shows how the highly chromatic succession of chords in Phrase 1 can be understood as a cycle of fifths through a portion of RS[C2]. The somewhat ambiguous nature of the opening chord permits analyzing it as an amalgamation of I and IV, followed by VII, III, and finally VI. Thus, I understand Phrase 1 in "Quiso" to, essentially, progress from I to VI in RS[C2], albeit in a highly chromaticized way.[219]

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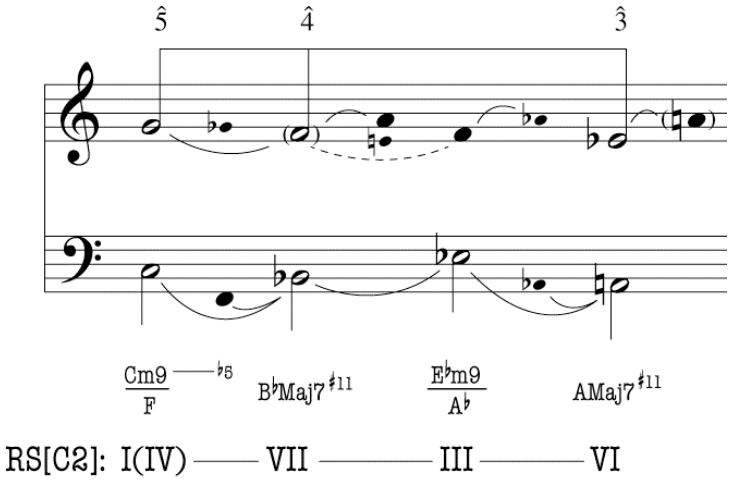
[218] A comprehensive hearing of this chord suggests various interpretations. For instance, it could be heard as F^{13}sus, which is encouraged by the perfect-fifth relationship between the bass notes of mm. 1-2.

[219] The relationship between Cmin and AMaj is an example of a chromatic mediant relation, as defined by David Kopp (*Chromatic Transformations in Nineteenth-Century Music,* 2002, 8-11). According to Kopp's theory, Cmin and AMaj share a "disjunct" relationship, because the chords have no tones in common and they differ in mode: <C, E♭, G> → <A, C♯, E>. A further criterion in Kopp's definition of disjunct mediants is that all of the pcs in the third-related chord fall outside of the diatonic set of the initial chord. However, because the governing set is RS[C2], and not RS[C6], the root of AMaj *is* a member of the referential set. Further, because we are not dealing with triads, the resulting relationship is even greater: for instance, the sharp eleven above A is the enharmonically reinterpreted third of Cmin (D♯ = E♭), creating another common tone. Details of voice leading between Cmin9/F and $AMaj7^{\sharp 11}$ can also, according to Kopp, help to strengthen the sense of functionality. These include root motion by consonant interval (C → A), the existence of a common tone (E♭ → D♯), and the presence of a linear semitone (e.g. D → C♯), all of which are aspects that are shared with a traditional tonic/dominant relationship. I feel that these criteria provide additional support in hearing these chords as related.

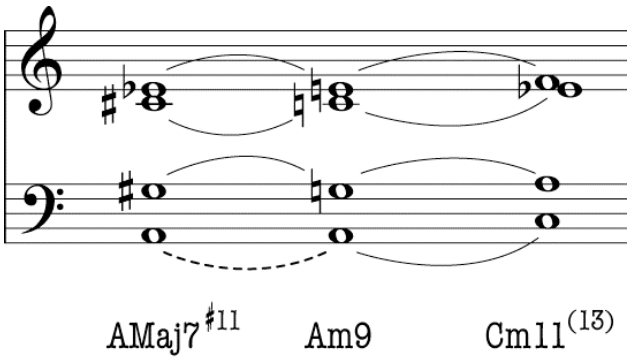
Example 4.29: Melody and chord structure of Phrase 1



Following Phrase 1, and prior to the onset of Phrase 2, there is a return to tonic-rooted harmony, Cmin11(13) (m. 6). Thus, the relationship between I and VI that is unfolded across mm. 1-4 is made more explicit now, since the latter harmony, AMaj7♯11 (m. 4), returns to the former in almost immediate succession, through an intervening Amin9 chord (m. 5). Example 4.30 shows a possible realization of the chord succession in mm. 4-6,[220] in which C♯ moves down by semitone to C♮, just as G♯ moves down by semitone to G♮, both anticipating C minor. Meanwhile, the melody's E♭4 moves up by semitone to E♮4, which then proceeds to F4 in m. 6. Connecting the chords in this way helps support my decision, previously discussed, to hear mm. 5-6 as grouped with the opening measures (refer back to Examples 4.21a-b and 4.22) rather than with those that follow. Further, because m. 6 is a C minor chord that supports a melodic F, I hear a registral inversion of bass note and melody from m. 1 (F ⇔ C). Accordingly, mm. 5-6 continue to support RS[C2], despite the melodic phrase boundary heard in m. 4.

[220] The example does not include the 9th above Amin (m. 5). Despite this, the example sufficiently reflects the lead-sheet harmonies, especially within the given context.

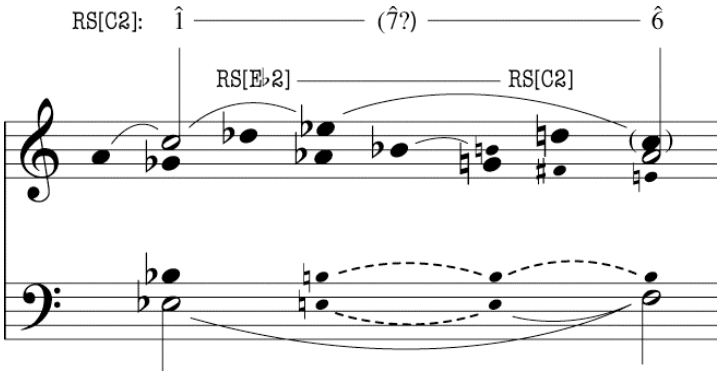
Example 4.30: Voice leading between AMaj7$^{(\sharp 11)}$ and Cmin11$^{(13)}$



Earlier, I described how the melody of the second phrase (mm. 7-10) is essentially a tritone transposition of Phrase 1, but most of the chords are not. Nevertheless, the chords in Phrase 2 do contribute to the tonality of the tune. Example 4.31 shows the structure of Phrase 2. It begins by briefly suggesting another referential set: the first chord in Phrase 2, E♭min13, can be understood as anticipating the tune's B Section, which is primarily governed by RS[E♭2]—a minor-third transposition of Section A. This anticipation is also apparent in the melody of m. 7, which includes the pitch D♭$_5$, a non-member of RS[C2] but a member of RS[E♭2].[221] After this allusion to E♭, members of the more prominent RS[C2] return, such as G♮ and D♮ (Emin9), as well as A♮, which is highlighted by durational accent. I hear this pitch as connected to the phrase's opening note, C$_5$ (Î in RS[C2]), reminding me of the bass motion that was heard in Phrase 1, between Cmin9 and AMaj7$^{\sharp 11}$; this relationship is indicated by the connected scale-degree numbers in the upper part of the example. I can now explain the order reversal of the first two pitches of the transposed melody (first noted above in regards to the chromatic heptachord, Examples 4.22-4.23). Wheeler's placement of C on the downbeat of m. 7, at the beginning of Phrase 2, is critical for the listener to retain a sense of RT[C] in the A Section, despite the chromaticism that follows.

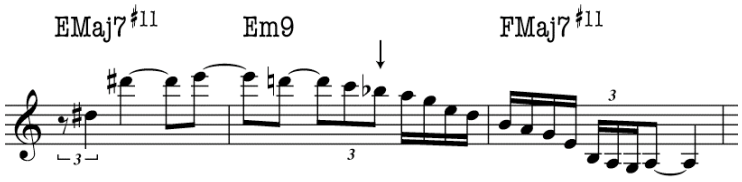
[221] Because I am hearing RS[E♭2] at the beginning, the melody's D♭$_5$ is not shown as a smaller notehead.

Example 4.31: Multi-voice skeleton of mm. 7-10 (plus anacrusis, m. 6)



Example 4.31 also shows how $\hat{1}$ and $\hat{6}$ in RS[C2] can be heard to be connected with $\hat{7}$, B♭. Of course, preferring B♭ over B♮ conflicts with the structural melody proposed for Phrase 1.[222] But hearing B♭ as more structural than B♮ supports the possibility of hearing the linear descent $\hat{8}$–$\hat{7}$–$\hat{6}$ in RS[C2] in Phrase 2, which parallels the $\hat{5}$–$\hat{4}$–$\hat{3}$ identified in the first phrase. In support of this, it might seem that Wheeler preferred B♭ in his improvisation over these measures, shown in Example 4.32, in which he plays a B♭ over Emin9, which would otherwise conflict with the B♮ in that chord.[223]

Example 4.32: Kenny Wheeler's solo on "Quiso" (mm.8-10, ~3:02-3:07)

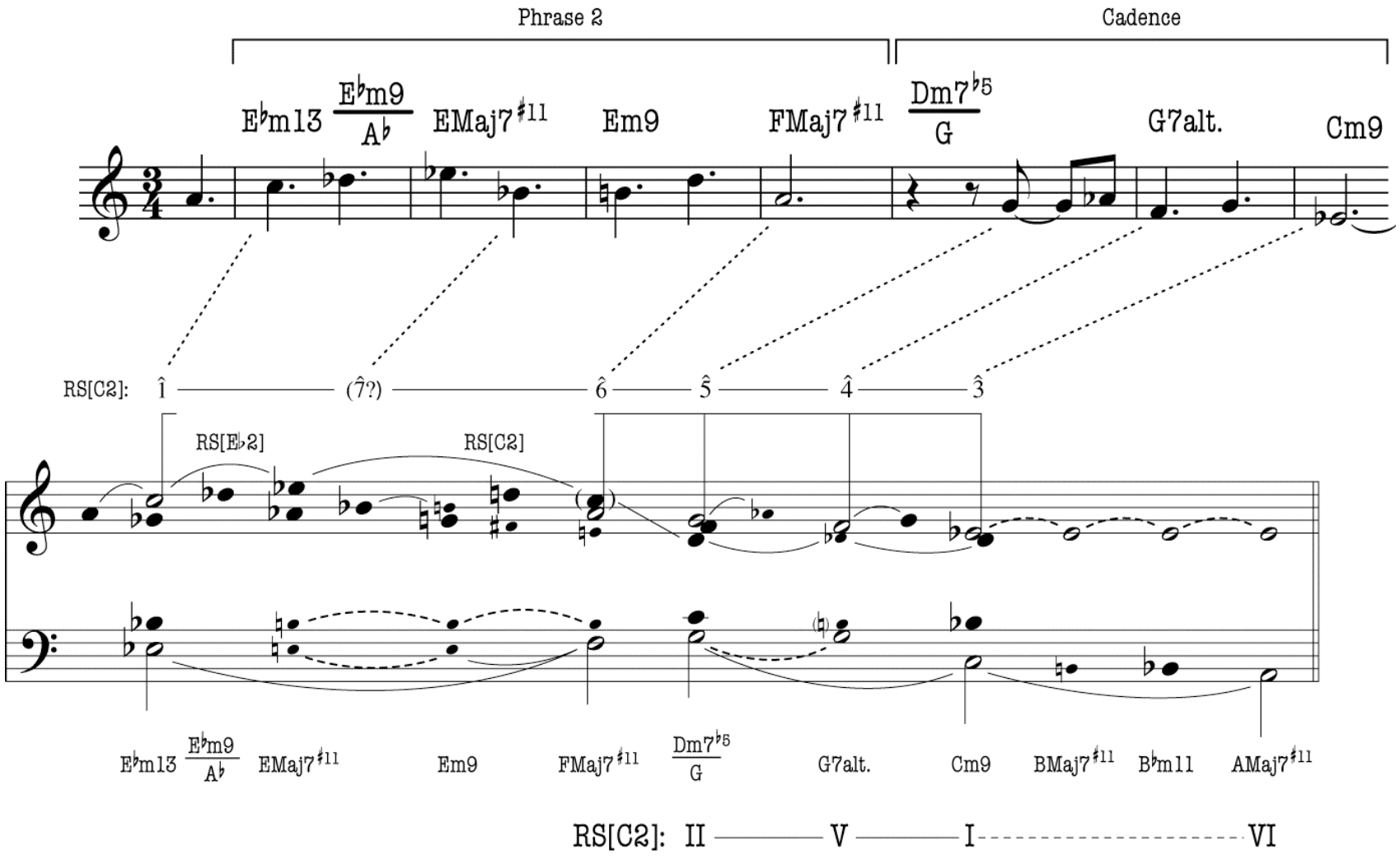


Continuity across the entire A section is affirmed by the cadential progression discussed earlier. Example 4.33 connects Phrase 2 to this cadence, and represents mm. 7-

[222] In Phrase 1, my reading prefers F♮ (m. 3, downbeat) to E♮ (m. 2, upbeat). The present hearing suggests preferring B♭ to B♮, which reverses the order of preferred notes in Phrase 1.

[223] The B♭ also conflicts with the sharp eleven over F, which is common to chords in both mm. 9-10. Thus, by choosing to play B♭ in m. 9, Wheeler is perhaps highlighting the more traditional motion between the outer voices <E, B♭> and <F, A>.

Example 4.33: "Quiso," Mm. 7-16, Section A



16. The example shows how non-RS[C2] members in the chord of m. 10, FMaj7$^{\sharp 11}$, connect smoothly to RS members in the chord of m. 11, helping to reestablish RS[C2] as the more prevalent set. Specifically, both the major seventh and sharp eleventh above F (shown in the example as E♮$_4$ and B♮$_3$, respectively) move up by semitone to F and C—the third and seventh above D, respectively.[224] What is most striking here is how the cadential progression in mm. 11-13 completes the fifth-cycle that was started in the chords of Phrase 1. Recall that the chords of Phrase 1, essentially, comprise a <I/IV, VII, III, VI> progression in RS[C2]. The cadence continues this pattern, and completes the cycle, with the progression <II, V, I>. This helps to provide closure to the section, but also a sense of continuity by explicitly connecting the opening of it to the close. As a result, I can retain a sense of pc grouping that was discussed earlier regarding the chromatic heptachords (refer back to Example 4.24). Example 4.34 recreates Example 4.24, but replaces the corresponding heptachordal collections with the appropriate referential sets.

Example 4.34: Structural design of Section A according to most prominent pcs

RS[C2] (Mm. 1-6)	RS[E♭2]/[C2]? (Mm. 7-10)	RS[C2] (Mm. 11-16)

Following the cadence in mm. 11-13, I hear a post-cadential expansion that continues the preference for RS[C2]. Specifically, Wheeler presents us with one more linear descent that connects $\hat{1}$ and $\hat{6}$ in RS[C2] in the bass between mm. 13-16, recalling the bass of Phrase 1 (Cmin9 → AMaj7$^{\sharp 11}$) and the melody of Phrase 2 ($C_5 \rightarrow A_4$). This

[224] It is noteworthy how non-RS[C2] member E♮ functions the same way in all cases: as a chromatic neighbor to F. This is the case in the melody of mm. 2-3 and 5-6, as well as the bass between mm. 9-10.

supports my hearing of Phrase 1, and of Cmin9 and AMaj7$^{\sharp 11}$ as structural components of the section overall.

Now that we have an understanding of the A Section of the tune, let us consider Section B. This section is an almost exact transposition of the first, up a minor third—a relationship that we saw earlier, in "Kind Folk." As we shall see, by altering particular chords in the tune's second section, Wheeler provides an overarching continuity to the tune as a whole—one that helps me to prefer RS[C2] as most prominent.

It follows from the aforementioned transposition between the sections that the referential set that governs much of Section B in "Quiso" is RS[E♭2].[225] In some respects, this RS is not a surprise. As already mentioned, it was anticipated in the opening of the A Section's second phrase. Also, in retrospect, the chord in m. 3, E♭min9/A♭, is not simply a transposition of the chord in m. 1, but a tonic chord in RS[E♭2], which also anticipates the RS of Section B.[226]

Wheeler's choice of transition harmony between the two sections' RSs, AMaj7$^{\sharp 11}$, indicates a sensitivity to pitch-class continuity across the formal division. This chord is already marked as special, because it is the only chord that recurs in the A Section (in mm. 4 and 16) aside from the tune's tonic chords, C minor and E♭ minor.[227] But it can

---

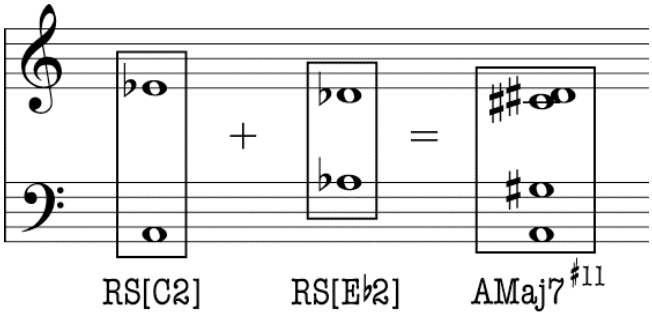
[225] It would also follow, therefore, that the chords in Section B essentially comprise a descending-fifth progression through this set. Because Section A places significant emphasis on set-members C, E♭, and A, or $\hat{1}$, $\hat{3}$, and $\hat{6}$ in RS[C2], it would follow that Section B similarly emphasizes E♭, G♭, and C. Thus, considering the tune as a whole, it is possible to identify an overarching emphasis on sc [0369], roughly construed as a subset of the octatonic collection. Given such an interpretation, one might identify a *non-diatonic* referential set to be governing the tune as a whole.

[226] It might also be said that the chromatic passing tone identified in the first measure (G♭$_4$) can be understood as anticipating m. 3's chord as well as the referential set the second section of "Quiso."

[227] This stands in contrast to the opening eight measures of both the A and B Sections in "Kind Folk", which cycle through a repeated succession of chords.

also be understood more deeply as a combination of members from both referential sets, RS[C2] and RS[E♭2].[228] A and D♯ (enharmonically respelled as E♭), the root and sharp eleventh of AMaj7$^{\sharp 11}$, are both characteristic pcs in RS[C2], since E♭ distinguishes the quality of the mode and A specifies it.[229] Further enharmonic reinterpretation similarly supports RS[E♭2], as shown in Example 4.35. D♭ and A♭, the third and seventh—or guide tones—of AMaj7$^{\sharp 11}$, are two out of the three pcs in RS[E♭2] that are not part of RS[C2], thus making them distinct. Both of these pitches make specific appearances in Section A: every occurrence of E♭min is over an A♭ in the bass; also, the E♭min chord in m. 7 supports a melodic D♭. Thus, it's possible to understand AMaj7$^{\sharp 11}$, as it occurs in the A Section of "Quiso," as either a subset of RS[C2] with altered pcs, or as a combination of members from both RS[C2] and RS[E♭2]. This makes the AMaj7$^{\sharp 11}$ in m. 16 an especially appropriate bridge that simultaneously incorporates members of both sets.

Example 4.35: Reinterpreting AMaj7$^{\sharp 11}$ as a combination of RS[C2] and RS[E♭2]



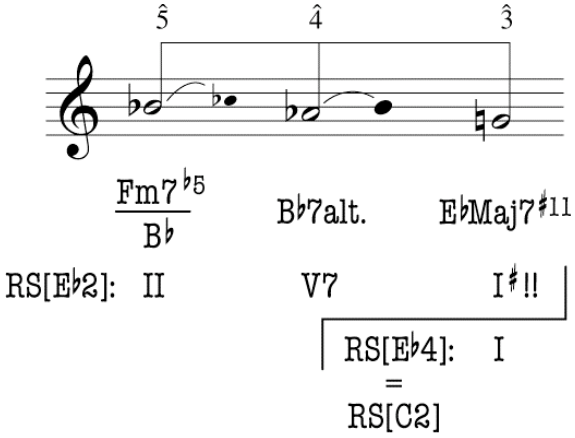
The cadence of the B Section imparts a strong sense of continuity to the tune as a whole. Instead of cadencing on E♭min9, an exact minor-third transposition of the cadential goal in the A Section (m. 13), Wheeler cadences on E♭Maj7$^{\sharp 11}$, a subset of RS[C2], which governed the first half of the tune. In isolation, and without regard for the

[228] Removed from the present context, this chord would traditionally be understood a subset of E Ionian.

[229] It is by the inclusion of A♮ that we know the mode is Dorian. The enharmonic respelling of D♯ to E♭ supports the idea of the latter pc being a member of RS[C2].

tune's opening, this cadential goal could be understood as a result of mixture—a type of *tierce de Picardie*, with the expected E♭ minor chord being replaced by its parallel major. Following a traditional chord/scale approach, this chord would be analyzed as a subset of E♭ Lydian, or following RS theory, of RS[E♭4]. Of course, RS[E♭4] is a rotation of RS[C2]. Therefore, when considering the generating set of this chord, I can understand it to function as a pivot chord, mediating the relationship between the two more prevalent RSs used in the tune, RS[C2] and RS[E♭2]. More specifically, E♭Maj7$^{\sharp 11}$ sustains a single tonic across Section B, RT[E♭], but prepares the return of Section A by using the members of its referential set, RS[C2]; this is illustrated in Example 4.36. This provides an overarching sense of continuity to the tune as a whole.

Example 4.36: Cadence in "Quiso's" B Section, reaffirming RS[C2] (mm. 27-29)



Particular chord successions in this tune anticipate those reused by Wheeler nine years later, in "Who Are You?." For instance, when performing multiple choruses on "Quiso," the chord that takes us back to the top of the form is D♭Maj13$^{\sharp 11}$. This specific chord manifests particular voice leading tendencies that allow me to hear it as quasi-functional. As described in my analysis of "Who Are You?," both G♭Maj9$^{\sharp 11}$ and B♭Maj9$^{\sharp 11}$ reminded me of tritone substitutes for functional Mm7 chords when they progressed to F major and A minor chords, respectively. Similarly, D♭Maj13$^{\sharp 11}$ reminds

me of a tritone substitute for G7, the dominant of the chord that opens "Quiso," which I now understand to be C minor. Of course, the MM7 quality of this chord reduces the pull towards m. 1 on account of D♭Maj13$^{\sharp 11}$ not including a leading tone to C (there is no B♮). But I can understand the relationship between the chord roots, D♭ and C, as an attempt to accommodate this absence, despite the fact that m. 1's tonic chord occurs over an F bass. Further, because a complete Cmin7 chord is included within D♭Maj13$^{\sharp 11}$, the connection between these two chords is enhanced. Moreover, it is noteworthy that the only two non-RS[C2] members in D♭Maj13$^{\sharp 11}$ are those distinct members of RS[E♭2] discussed earlier (Example 4.35), D♭ and A♭, drawing further attention to these contextually-important pcs.

In my analysis of "Kind Folk," I showed how continuity across the tune as a whole results from RTs in each subphrase outlining a B minor tetrachord, and thus enabling me to hear RT[B] as most prominent across the entire tune. In "Quiso," the transpositional relationship between the two sections results in two distinct RTs, [C] and [E♭] respectively. However, an overarching sense of continuity is attained when the members of RS[C2] return as RS[E♭4] at an important moment near the end of Section B, suggesting these members as most prominent. As opposed to a traditional analytical approach, which might dissect the musical material into segments as short as a single measure, the analyses included here support the validity of RS theory by identifying longer reaching continuities, in ways that are contextually-appropriate to the tune being considered. This, in turn, can provide both listeners and performers with routes to a less fragmentary and more holistic understanding of the tune.

As contemporary jazz developed, the type of chromaticism exhibited in "Kind Folk," and even more so in "Quiso," continued to evolve. As the next chapter will attempt to demonstrate, jazz writing in the current century subsumes some of the characteristics of earlier models, but embellishes them greatly. This results in an exciting combination of

chromatic melody and non-diatonic harmony. As we shall see, this combination resists traditional methods of jazz analysis, but not those outlined in referential set theory.

CHAPTER 5
THE NEW (YORK) SCHOOL: JAZZ IN THE 21st CENTURY

Chromaticism, such as that used in "Quiso," has persisted into 21st century jazz—so much so that non-diatonicism can be understood as a characteristic feature of much of today's writing. This might suggest that identifying a single most prominent pc-set, let alone a diatonic one, is unnecessary or even impossible. However, the analyses in the present chapter will show that, despite the extensive chromaticism, a large portion of the music can be understood productively as governed by referential sets—indeed, by diatonic collections.

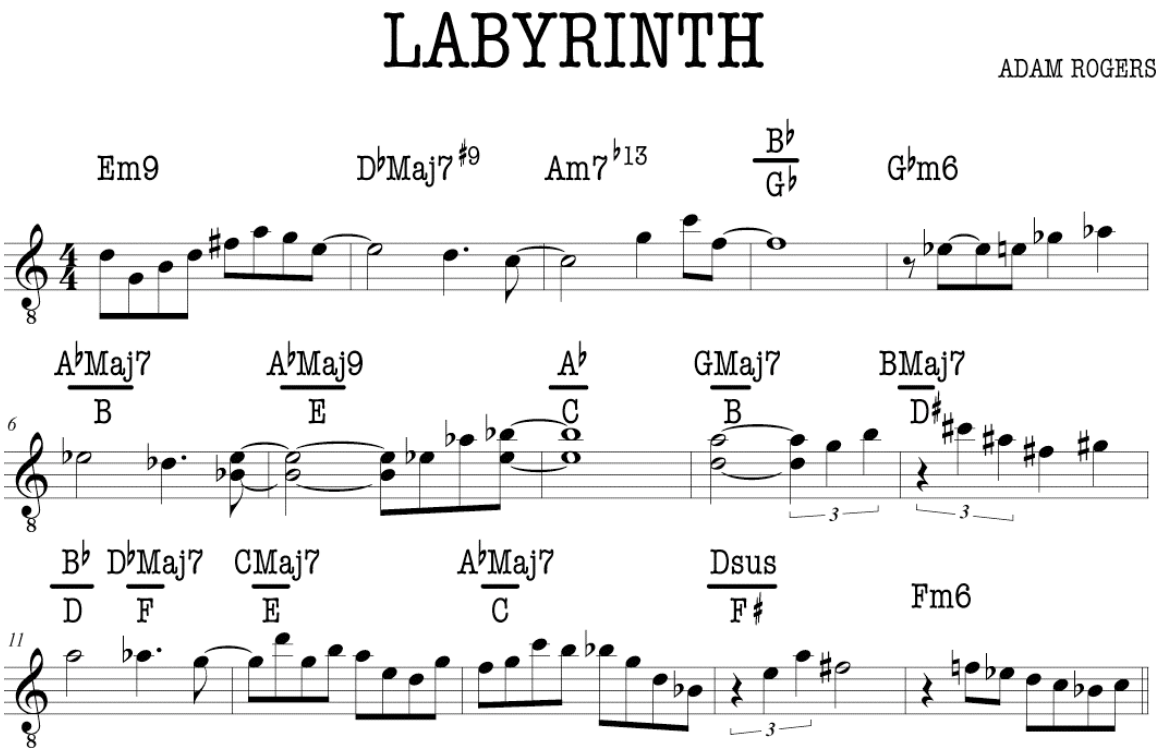
The dense chromatic textures of some recent jazz writing, when approached from the perspective of referential set theory, require a certain amount of flexibility in the application of the theory. At moments, the chromaticism is so intense that the designated set's identity is obscured to the point where only one of its pcs remains prominent. In such cases the RT is more important than the RS, and even if a particular set can be analyzed as prominent, the recognition of a significant number of alterations will be required.

The two composers examined in this chapter are prominent members of the current New York jazz scene. As we shall see, their tunes are highly chromatic and non-traditional in terms of chord succession, formal design, and, in the latter case, lead-sheet presentation. However, I will attempt to show how, even in such unconstrained circumstances, the theory of referential sets remains pertinent, privileging particular pcs in a hierarchy that supports hearing longer-reaching continuities. As well, the heuristics that outline this theory provide an appropriate method for interpreting the tunes, resulting in contextually appropriate readings of the lead sheets.

ADAM ROGERS'S "LABYRINTH"

Example 5.1 shows a lead sheet for "Labyrinth," composed by New York-based guitarist Adam Rogers.[230] The tune is featured on the album *Apparitions*, released in 2005 (on Criss Cross), and features Rogers on guitar, Chris Potter on tenor saxophone, Edward Simon on piano, Scott Colley on bass, and Clarence Penn on drums. The guitar and tenor saxophone double the melody of the tune, except at harmonic dyads, when each instrument takes a single note.[231] The piano plays the notated chords throughout.

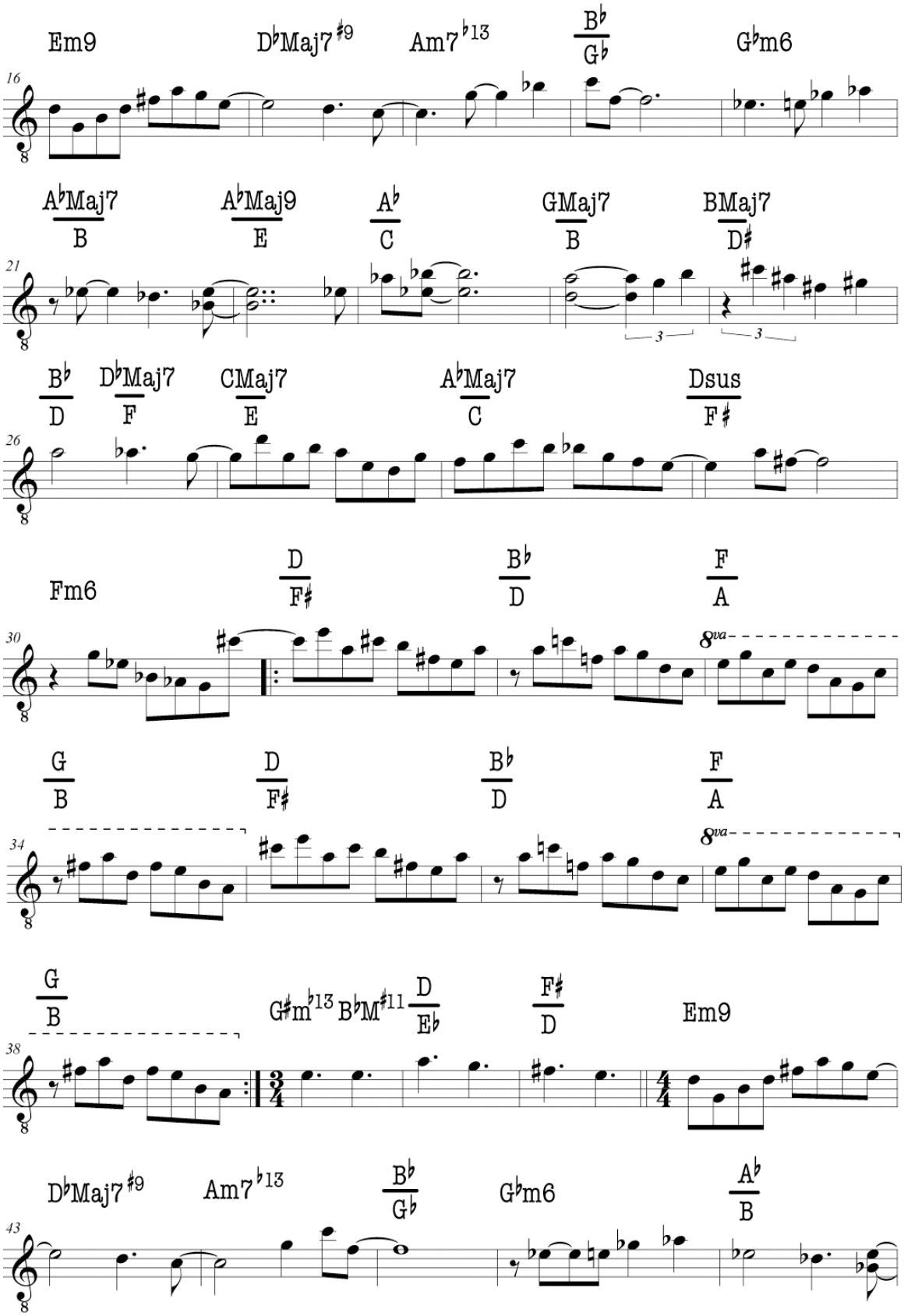
Example 5.1: Lead sheet for "Labyrinth"



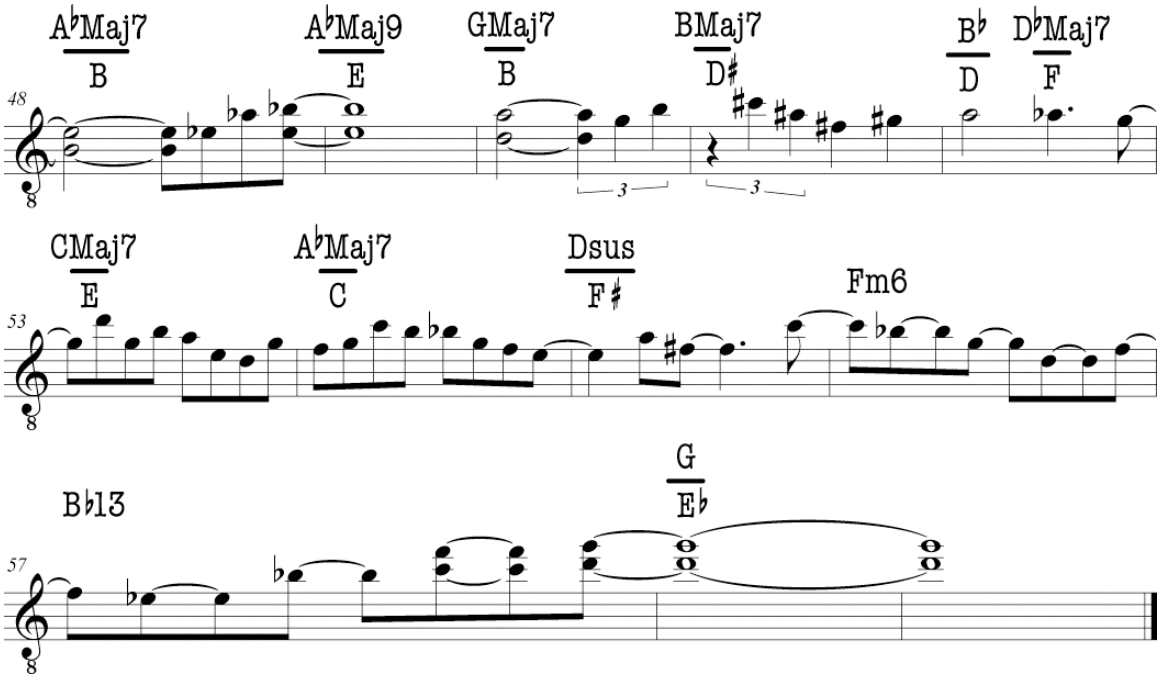
[230] Adam Rogers, "Labyrinth," composed by Adam Rogers, produced by Gerry Teekens (*Apparitions*, Criss Cross Jazz B0007Y09KU, 2005). This lead sheet is transcribed from an original, received from Rogers on Oct. 1, 2009.

[231] The B Section features a counter melody, which is played by the tenor saxophone. For simplicity and ease of representation, this melody is not included on the lead sheet shown in Example 5.1, but will be discussed below.

Example 5.1: (continued)



Example 5.1: (continued)



The form of "Labyrinth" can be heard as AABA, but it is not standard. Including repeats, the tune takes 67 measures, with the first and second A Sections comprising 15 measures each (A1 = mm. 1-15, A2 = mm. 16-30), and the final A Section comprising 18 measures (A3 = mm. 42-59), instead of the usual 16. The B Section (mm. 31-38, repeated to make 16 bars), which in some ways is the most traditional segment of the tune, is succeeded by 3 measures of 3/4 (mm. 39-41), contrasting with the common time of the rest of the tune, which serve as a transition to the final A Section. An open vamp on the last chord follows the tune's final cadence, with the return to the top of the form occurring "on cue."[232] These unusual rhythmic features can thwart one's expectations of arrival and long-range goals. For instance, the end of sections A1 and A2 unexpectedly veer off track when the return to the top of the form occurs one measure sooner than expected; also, the

[232] "On cue" means that the soloist will visually signal the other musicians to change parts; this occurs when the soloist has finished improvising over the present material.

vamp that follows the final measure leaves the listener temporarily in suspense about how the tune is to proceed.

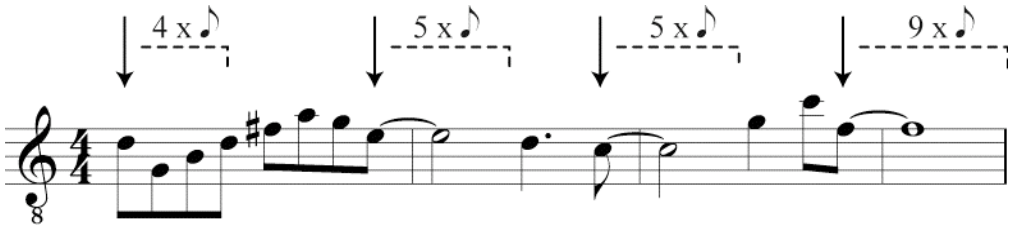
Partly as a consequence, the tonality of "Labyrinth" is similarly unclear. Until the very end (and maybe not even then) there are no II → V → I key-defining gestures, and constant chromaticism makes it difficult to discern smaller referential sets. For instance, the opening gesture, played over Emin9, could suggest RT[E], but the RS is unclear, given the absence of C/C♯—it could either be RS[E6] or RS[E2], respectively. The D♭ in the harmony of m. 2 could, in this regard, be interpreted as an enharmonically respelled C♯, confirming RS[E2]. This set could be heard as further supported in m. 2 by the raised ninth noted in the chord label (♯9 = E♮), which alters a more stable E♭ in favor of the aforementioned referential set. However, the remaining chord tones in m. 2, F, A♭, and C, are in conflict with RS[E2], making it difficult to decide on one referential set.

Despite these irregularities, specific musical events enable me to partition the tune into short segments, each with a consistent RS, that guide me through its labyrinth. Further, the following analysis will show how the recurrence of a single RT can be heard to support an overarching continuity through the tune as a whole.

In consideration of the upbeat tempo used on the recording—approximately 250 bpm—durational accents provide significant points of repose, partitioning the melody into four-measure phrases. For instance, the long duration spent on F_5 in m. 4 (9 x ♪) creates the perception of a phrase boundary, helping me to hear mm. 1-4 as the tune's first phrase. Accents prior to this also help to prioritize certain pitches, which—setting aside the actual harmonization for the moment—suggest (or at least constrain in the direction of) particular RSs. Example 5.2 shows Phrase 1 of "Labyrinth," and highlights its durational accents by the arrows and broken lines. Following the opening stream of successive eighth notes, the 5-♪ duration spent on E_5 helps me to hear this pitch as an arrival, and, therefore, as structurally significant. The long durations of C_5 and, as already

mentioned, F_5 have this same effect. I will, therefore, consider these three pitches as structural. Lastly, although it is not emphasized by a durational accent, I am initially attracted to the melody's first note (D_5), which I hear as being prolonged through a G major triad. As a result, I include this pitch as part of the structural melody.

Example 5.2: Durational accents in the first phrase of "Labyrinth" (mm. 1-4)



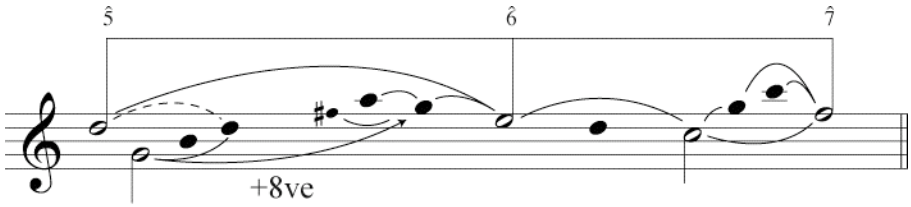
When considering both the melody's structural pitches and its arpeggiated chords, I start to get a sense of RT as well as its corresponding RS. For instance, I hear the melody as consisting of a G major triad (m. 1) followed by a C major triad (mm. 2-3). Because G major opens the phrase, my preference is to hear these arpeggiations as outlining a I → IV progression, implying the possibility of RT[G] for the phrase.

After assigning an RT, it could be possible to determine the RS to be <G, A, B, C, D, E, F, F♯>. But Heuristic 6 (wherever possible, the referential set should be a diatonic collection) suggests choosing only one of F♯ and F♮ as an RS member. Despite the fact that I hear F♯ as a leading tone to RT[G], other factors contribute to me preferring F♮—especially when disregarding any harmonic accompaniment. As previously mentioned, F_5 is emphasized in the melody by durational accent, and of all such candidates for structural pitches, F is the highest. Therefore, I determine the RS of the unaccompanied melody to be <G, A, B, C, D, E, F>, which I represent as RS[G5].

Extending the analytical observations made so far, Example 5.3 presents a reduction of the melody in order to show an underlying continuity. The root of the tonic triad, G_4, is transferred up an octave to G_5 (+8ve), and is emphasized by approach tones

(F♯$_5$ and A$_5$), helping to establish its significance within the phrase. Subsequently, the structural D$_5$ moves up by step to E$_5$. E$_5$ then returns to D$_5$ on its way down to C$_5$, which leaps up to G$_5$ before finally arriving on F$_5$. The ascent to F$_5$ is highlighted in the example by the beam connecting those structural pitches that are connected by step. Since the RS is diatonic, these structural pitches are labeled using scale degrees $\hat{5}$, $\hat{6}$, and $\hat{7}$, respectively. Also, because G$_4$ and C$_5$ are understood as roots within their respective arpeggiations, I consider them to be structural members of the phrase's melody. But because these are not connected to adjacent structural members by step, they receive downward-facing stems.

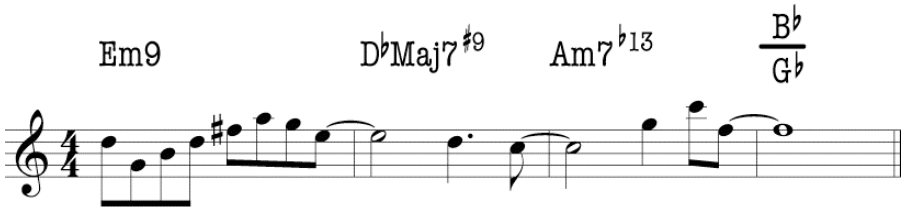
Example 5.3: Structural melody of Phrase 1 (mm. 1-4)



Let us now consider the actual chords used in the first phrase, shown in Example 5.4. It is immediately evident that this passage does not include any traditional progressions. As a result, the tonality of the phrase that is suggested by the melody is obscured. However, with careful consideration, I can understand this chromatic progression to be consistent with the tonal and contrapuntal interpretation I've proposed for the melody. First, under the concept of inclusion (any melody or chord can be representative of the referential set if its pc members are a part of the set that has been designated referential), the chord in m. 3, Amin7$^{\flat 13}$, is referential, since it can be read as including all of the members of RS[G5], (A, C, E, G, B, D, F). Further, this chord can be analyzed as a substitute for the C major chord arpeggiated in the melody, a relationship that can be extended to the first measure of the phrase, where E minor substitutes for a

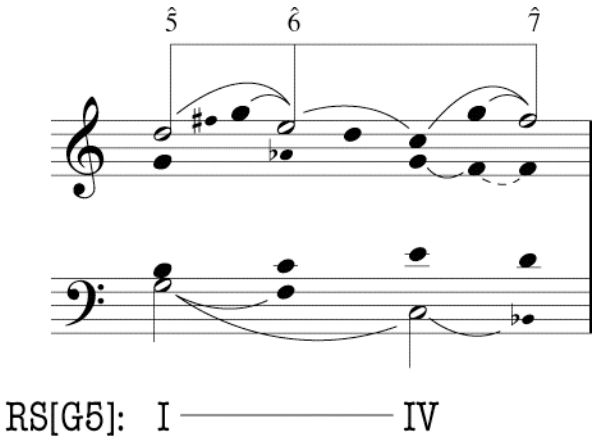
tonic G major. The presence of these tertian collections helps to support my earlier observations made in regards to the unaccompanied melody.

Example 5.4: Chord series used in Phrase 1 (melody included)



Example 5.5 presents a harmonic reduction of the first phrase, as I understand it. Along with most of the melody pitches as an upper voice, it contains an alto voice, <G, A♭, G, F> that I will show below to have larger-scale repercussions. In order to show an underlying progression, the example represents chords 1 and 3 as non-substitutes: G major and C major, respectively. Because I hear these chords as structural, only G_3 and C_3 (the effective roots of the chords in mm. 1 and 3) are stemmed in the lower part of the example, and I understand chords 2 and 4 to be functioning as lower neighbors to these structural chords.

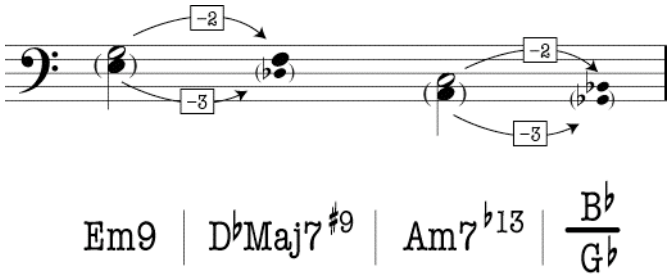
Example 5.5: Harmonic sequence between mm. 1-2 and mm. 3-4



Understanding the structural chords in Phrase 1 to be represented by substitute diatonic chords whose roots are a third below helps me to contextualize the intervening

chromatic chords. Specifically, chords 1 and 3 can be analyzed as G/E and C/A, respectively. Consistent with that interpretation, I can understand F to be the actual root of the chord in m. 2, which is subposed by a chromatic pitch a major third below. Thus, D♭Maj7$^{\sharp 9}$, which is specified on the lead sheet, can be heard as, essentially, an F minor chord.[233] This reinterpretation enables me to hear a descending step through the RS between the roots of the first two chords, $\hat{1} \rightarrow \hat{7}$ in RS[G5], and the first chord as embellished by a chord that is a major second below. The relationship between chords 1 and 2 is then reproduced between chords 3 and 4, C major → B♭ major. Accordingly, I can understand mm. 3-4 as a sequence of mm. 1-2, which is loosely transposed down a perfect fifth. The subposed bass note in m. 2 is subsequently mimicked in m. 4 by G♭, which is a result of the sequence. Example 5.6 shows the root succession of Phrase 1, and includes the subposed bass line in parentheses. As can be seen, the structural chords (chords 1 and 3) are subposed by diatonic notes a minor third below, and non-structural chords (chords 2 and 4) are subposed by chromatic notes a major third below.[234]

Example 5.6: Root succession and subposition in Phrase 1 of "Labyrinth"

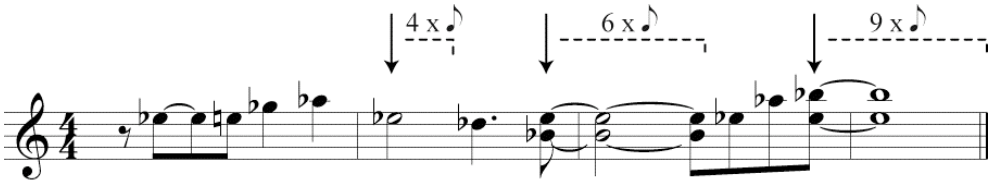


[233] This hearing is also influenced by my strong sense of diatonicism in the melody, in which I prefer the D♮$_5$ that connects E$_5$ to C$_5$ to the bass's D♭.

[234] Of course, the root (as I am analyzing it) of chord 4 is a non-RS member. I understand the use of B♭ instead of B♮ as accommodating the chromatic sequence between successive chord roots. It could, however, be used to avoid the tritone between the chord root and melody, or resulting from mixture (in which a major mode on G borrows from a minor mode on G).

The phrase boundary at m. 5 provides an opportunity to reorient my hearing around another referential set, if necessary. This new phrase is punctuated by the same 9-♪ durational accent that was identified at the end of Phrase 1, on the dyad (E♭$_5$, B♭$_5$), creating another phrase boundary. As opposed to Phrase 1, however, the greatest durational accents in Phrase 2 are all heard on a single pitch, E♭$_5$, as shown in Example 5.7.

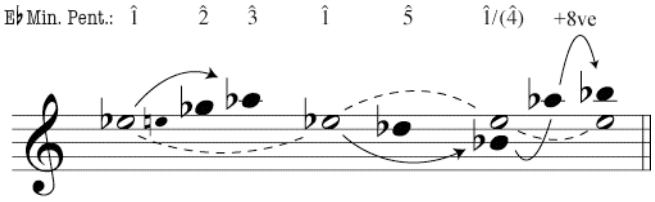
Example 5.7: Melody in Phrase 2 of A Section (mm. 5-8)



The melody in Phrase 2 has a pentatonic quality. In fact, with the exception of a single pitch (E$_5$), the melody comprises a complete E♭ minor pentatonic collection, <E♭, G♭, A♭, B♭, D♭>: m. 5 moves up by step through the pentatonic collection, from E♭$_5$ → (E♮$_5$) → G♭$_5$ → A♭$_5$, and m. 6 moves down by step, from E♭$_5$ → D♭$_5$ → B♭$_4$. More generally, I hear this melody moving up a perfect fourth in m. 5, from E♭$_5$ → A♭$_5$, and down a perfect fourth in m. 6, from E♭$_5$ → B♭$_4$. However, because B♭$_4$ is voiced below E♭$_5$ in m. 6, I continue to hear E♭$_5$ as a more prominent melodic pitch, which is sustained into m. 7; D♭$_5$ functions as a melodic neighbor to E♭. B♭$_4$ is then transferred up an octave (+8ve), resulting in an inversion of the (B♭$_4$, E♭$_5$) dyad that entered just before m. 7. The prominence of E♭ across the phrase enables me to hear this note as structural. Accordingly, Example 5.8 represents it with an open notehead.[235]

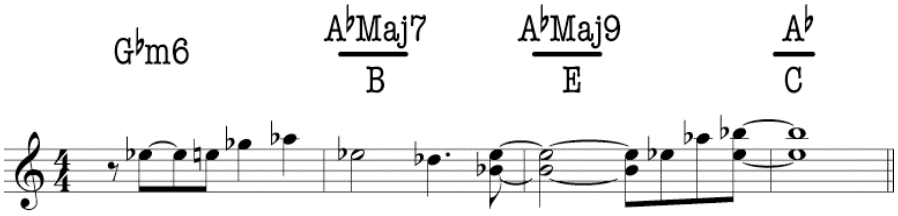
[235] In playing through the melody of Phrase 2, it is also possible for me to hear its entire collection of pitches as belonging to a single diatonic set. More specifically, enharmonic reinterpretation enables me to hear this melody as generated by a set that contains the pcs (D♯, E, F♯, G♯, A♯, C♯) and, as a result, being structured around D♯$_5$ instead of E♭$_5$. However, the visual cue provided by the lead sheet chords (discussed below) makes it

Example 5.8: Structural melody of second phrase (mm. 5-8)



Let us now consider the actual chords in Phrase 2, shown in Example 5.9. Following from the two preceding examples, it seems sensible to analyze an RT shift from RT[G] in Phrase 1 to a new RT in Phrase 2. According to Example 5.8, the shift between successive RTs would be by descending major third, from RT[G] to RT[E♭]. This relationship reminds me of the chromatic-third subposition identified in the chords of mm. 2 and 4; chromatic because E♭ is not a member of RS[G5], and subposed since RT[E♭] occurs after RT[G]. However, the lead-sheet chords do not specifically support this shift, since chords 2-4 are all A♭ major chords. Therefore, when considering the structural melody and the chords together, I hear E♭ as the fifth of A♭, and I understand RS[A♭1] as the governing set of Phrase 2.

Example 5.9: Chord series used in Phrase 2 (melody included)



Example 5.10 shows how, with the exception of the bass line, the series of chords used in Phrase 2 can be accounted for under RS[A♭1]. Clearly, chords 2-4 are all variations of A♭ major. But the prevalence of the melody's E♭ across the entire phrase helps me to elevate its significance in chord 1, and I can hear it as the actual root of the

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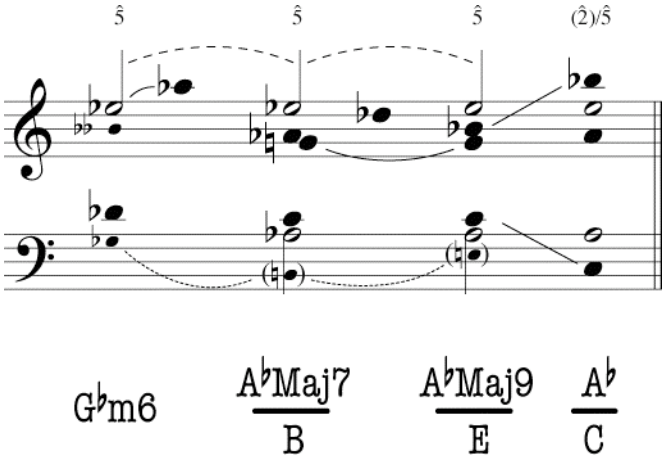
unlikely that one would reinterpret the phrase as including a melodic D♯ over an A♭-rooted chord.

chord (not simply an extension above a non-set member bass note). The result is, therefore, an E♭-rooted chord in first inversion, <G♭, B♭♭, D♭, E♭>.[236] In the present context, this chord can be understood as an altered chord in A♭, whose third and fifth have been momentarily displaced down by a half step; the G♭ can be explained as mixture, but also persists from the last chord of the previous phrase (m. 4),[237] and the B♭♭ creates an upper leading tone (♭$\hat{2}$) to the A♭, helping to emphasize the RT of the phrase. From here, the bass line moves up a perfect fourth (G♭ to B), mirroring the melody's ascending fourth, and repeats the motion into m. 7 (these leaps are highlighted by the dotted line in the lower staff of the example). I can understand the displaced G♭ in m. 5 to be "corrected" by the major seventh that is included in the chord of m. 6 (G♮), and the B♮ in the bass of m. 6 to be "corrected" by the added ninth in m. 7 (B♭). Thus, both of these chromatic notes can, in adhering to Heuristic 3 (the RS should be chosen so that every pc that does not belong to it can be understood as an alteration, by minimal interval, of a pc in the referential set), be understood as momentarily altered members of RS[A♭1]. The E♮ in the bass of m. 7 is in conflict with the structural melodic pitch, reminding me of the major third subposition that was used in mm. 2 and 4 of Phrase 1 (thus, shown in parentheses in the example). The open noteheads in the bass of Example 5.10 represent the actual roots of the chords, as I understand them. The implication of this reading is that the bass line—in earlier styles normally the roots of the chords—in this passage is heard to consist of dissonant pitches that have been added to an otherwise stable musical setting. As in previous examples, non-set members are represented by smaller noteheads.

[236] As will be shown, first inversion chords appear prominently throughout the tune, helping to support this hearing.

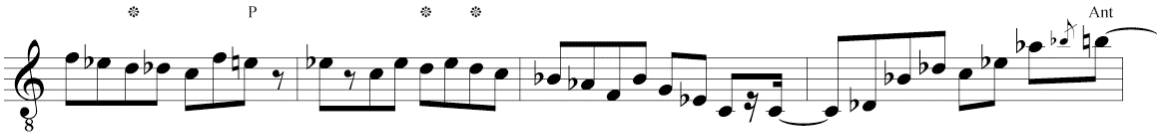
[237] Otherwise, G♮ would also work in this setting. The whole step between G♭ and A♭, however, also reminds me of that between G and F in Phrase 1.

Example 5.10: Measures 5-8 as supporting RS[A♭1]



RS[A♭1] is indeed affirmed by Rogers's solo over these measures, shown in Example 5.11. Apart from E_5, which can be understood as a chromatic passing tone (P) between F_5 and $E♭_5$, and B_5, which is an anticipation (Ant) of the next measure, the only pitch that is in conflict with RS[A♭1] is D_5, which occurs in mm. 5-6 (highlighted by ❁).[238] Following from these observations, I can understand an RT shift of an ascending minor second from Phrase 1 to Phrase 2, where RT[G] moves to RT[A♭].

Example 5.11: Adam Rogers's solo, "Labyrinth" (mm. 5-8, A3, ~2:35-2:38)

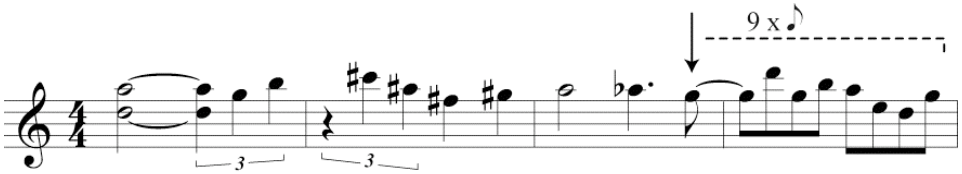


Example 5.12 shows the melody from mm. 9-12, the third phrase in the A Section. The durational accent identified in the example suggests that G_5 is prolonged throughout the entire 9-♪ duration that follows it, recalling the durational accent used to punctuate the ends of both Phrases 1 and 2. On the immediate surface, the eighth notes in this duration arpeggiate a G major triad. The phrase's first measure (m. 9) also consists of

[238] The D_5 in m. 5 could be analyzed as a chromatic passing note between $E♭_5$ and $D♭_5$. Similarly, the first D_5 in m. 6 could be analyzed as a chromatic neighbor to $E♭_5$.

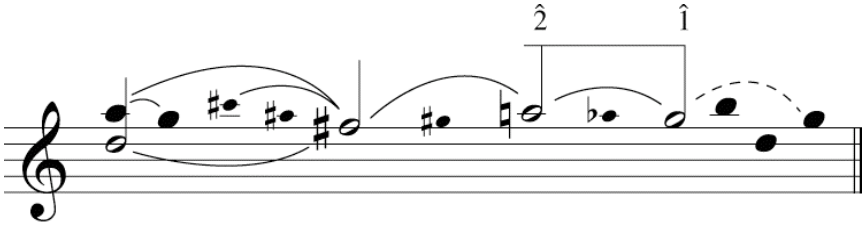
an arpeggiated G major triad, paired with its ninth (A_5). So, because the phrase is bounded by G major, I hear it as governed by RT[G], despite the intervening chromaticism.

Example 5.12: Melody in third phrase of A Section (mm. 9-12)



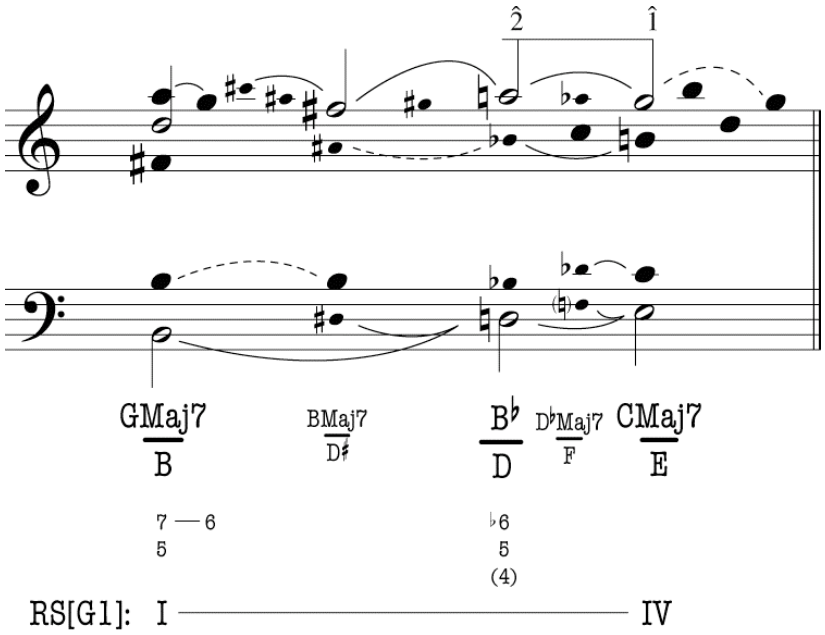
This hearing suggests an underlying melodic continuity, represented by the melodic reduction in Example 5.13. Despite the fact that A appears in the upper voice, I hear the <D5, A5> dyad as following <E♭, B♭> from the preceding phrase, in which the structural E♭ was "covered" by its fifth. Accordingly, I hear D_5 as the structural melodic pitch in m. 9, reminding me of the tune's opening measure, where I identified a melodically-structural D over an arpeggiated G major chord. Primarily as a result of its slight durational accent and more stable metrical position, I hear $F\sharp_5$ as an important pitch in m. 10, and the durational accent on A_5 asserts its significance in m. 11. It is noteworthy how the structural G_5 in m. 12 is approached with both the upper and lower ornamental notes A_5 and $F\sharp_5$, which is a loose augmentation of the embellishment of G_5 in m. 1 (see Example 5.3). My analysis of the melody of Phrase 3, therefore, fixes RT[G].

Example 5.13: Structural melody of third phrase (mm. 9-12), supporting RS[G1]



With a governing RT established, Example 5.14 extends the previous example by providing a possible realization of the chord series of Phrase 3. The collection of notes that make up Phrase 3, when restricted to the structural melody and the bass line, is (G, A, B, D, E, F♯). The absence of both C and C♯ from this structure makes the specific set somewhat unclear. However, I am choosing to prioritize the more stable C♮ from the harmony in m. 12 over the fleeting $C♯_6$ used in the melody of m. 10. As a result, I understand RS[G1] to be the most prevalent set in Phrase 3.

Example 5.14: Chord series of Phrase 3 (mm. 9-12)



The approach to m. 12, the goal of the phrase, is highlighted by an accelerated harmonic rhythm; m. 11 is the only measure in the entire tune that has two chords in it—all the others have one. Because of the direct transpositional relationship between D♭Maj7/F and CMaj7/E (–1 semitone), and because the meter and rhythm make the former chord sound anacrustic to the latter, I analyze D♭Maj7/F as a chromatic embellishment—a chromatic prefix chord—in which every note in CMaj7/E is approached by descending semitone. A similar observation can be made in the relationship between BMaj7/D♯ and B♭/D, where almost every note in B♭/D is

approached by descending semitone.[239] The example labels embellishing chords with smaller type in order to depict their subsidiary relationship to more structural sonorities. The outer chords, GMaj7/B and CMaj7/E, are both generated by the same set that governs the melody, RS[G1], helping to frame the phrase. The intermediary chord, B♭/D, can be understood as alluding to mixture, where G major is temporarily transformed into G minor, and does not detract from my preference for RT[G]. This mixture is reflected in the Roman numeral and figured bass analysis provided at the bottom of the example. Accordingly, I understand Phrase 3 as asserting a return to the RT used in Phrase 1.

The connection between the first and third phrases is also supported in the chords. Based on the concept of inclusion, I understand the chord in m. 9 as related to the chord in the tune's opening measure, Emin9, since they use many of the same pcs. More notable, however, is the fact that both Phrase 1 and Phrase 3 include a structural tonic → subdominant progression. So, in analogy to more traditional forms, I can hear m. 9 as initiating an 8-bar consequent to mm. 1-8.

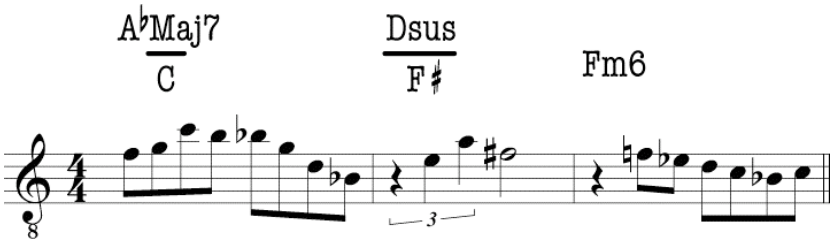
The final phrase of Section A1, shown in Example 5.15, also involves a single RS, albeit in a complicated way. I hear this three-measure phrase as supporting RS[F2]. Example 5.16 shows that I hear the melody's most structural pitches as $G_5 \rightarrow E_5 \rightarrow F_5$, or $\hat{2} \rightarrow \sharp\hat{7} \rightarrow \hat{1}$ in RS[F2]. The melody's G_5 is held over from the previous phrase, and falls a minor third to the leading tone, E_5, an altered set member. E_5 then leaps up to another altered member ($\flat\hat{2}$) before resolving to the tonic, F_5.[240] Though these approach tones

[239] The major seventh in BMaj7/D♯ is an enharmonically respelled B♭, so the root of B♭/D can be understood as being approached by both descending semitone and common tone.

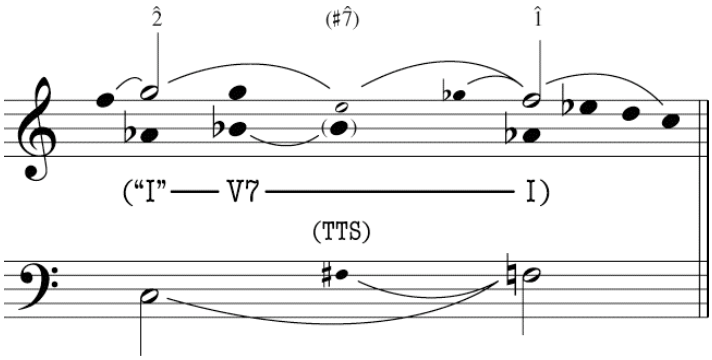
[240] The example respells $F\sharp_5$ as $G\flat_5$ in order to highlight its melodic motion to the tonic, F_5, more clearly. Because of its longer duration, it could be possible to hear this note as more structural that E♮. However, the following observations should clarify my choice. In either case, because both E♮ and F♯ are chromatically altered notes that are connected to the tonic by semitone, the sense of RT[F] should not be disrupted.

occur in reverse order, approaching the RT via $\hat{2}$ and $\#\hat{7}$ reminds me of similar events that were identified twice earlier, in the first measure of Phrase 1 and then in augmented form in Phrase 3. Following the F_5 in m. 15, the melody moves down by step through the set to $\hat{5}$ (C_5). Despite the presence of an altered member in the structural melody, my hearing of an overarching RT is not disrupted, since I hear E_5 as a leading tone to RT[F]. Therefore, the example represents this note with an open notehead. Its smaller size represents its non-set status.

Example 5.15: Melody in final phrase of Section A1 (mm. 13-15)



Example 5.16: Structural melody of final phrase, plus implied harmony (mm. 13-15)



Between the staves in Example 5.16, I have provided a basic Roman numeral analysis, which supports the structural melody. Given the RS that I have determined for this phrase, I can hear the chord in m. 13 as tonic substitute (represented in the example as "I").[241] Though there is no B♭ present in the second measure of the phrase, I tend to

[241] In a minor mode, the major triad built on $\hat{3}$ can be understood as the *minor-tonic-parallel*.

hear the leap from B♭$_4$ → E$_5$ that occurs in the melody between mm. 13-14 as outlining the augmented-4th that is characteristic of Mm7 chords.[242] It is for this reason that the example shows V7 beginning here, since the presence of these two pitches suggests dominant function. I can then hear B♭$_4$ sustained through the following chord in the example, and resolved accordingly to A♭$_4$, the third of F minor. Dominant function is also emphasized in the bass, where F♯ precedes F, which is characteristic of a chord being approached by its tritone-substituted dominant (labeled TTS in the example). Over this, I can analyze the melody's A$_5$ as a raised ninth (G double-sharp, not included in the structural melody) over an F♯ root. Similarly, the minor ninth between the bass's F♯ and the G in the upper part of the actual chord (which results from the 'sus' over D) reminds me of a flat ninth over the same root.[243] The combination of these factors allows me to hear dominant function in m. 14, and a tonal progression (I → V → I) across the phrase, strongly supporting RT[F].

Dominant function in m. 14 is also supported in Rogers's solo. Example 5.17a shows an excerpt from his solo over mm. 13-15 in the first A Section. Here, Rogers plays a C major triad over Dsus/F♯, supporting the possibility that E$_5$ is structural. Every other pitch used across the phrase is a member of RS[F2], thus supporting this as the most prevalent set in the phrase. The E$_5$ in m. 14, used in both the melody and in Rogers's solo, is understood as an altered member within that set. RS[F2] is similarly supported in Rogers's solo over the second A Section, shown in Example 5.17b, where Rogers uses RS[F2] throughout all three measures.

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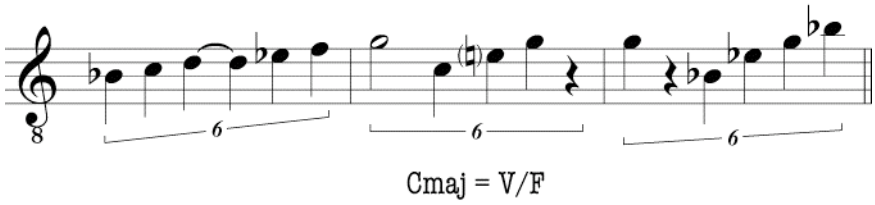
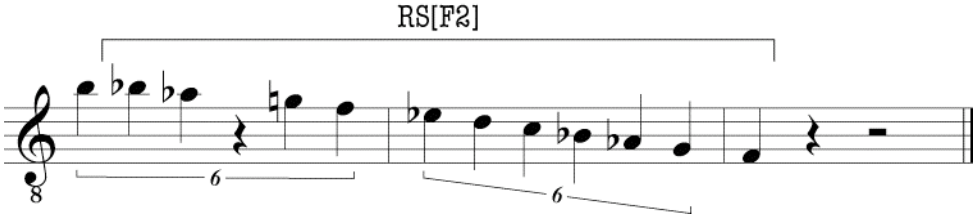
[242] This leap also intensifies the prominence of E♮, and helps me to prioritize it over F♯ as structural pitch.

[243] Altered ninths are common chordal extensions added to dominant chords in minor contexts.

Example 5.17a: Adam Rogers's solo, "Labyrinth" (mm. 13-15, A1, 1:58-2:00)



Example 5.17b: Adam Rogers's solo, "Labyrinth" (mm. 13-15, A2, 2:12-2:14)



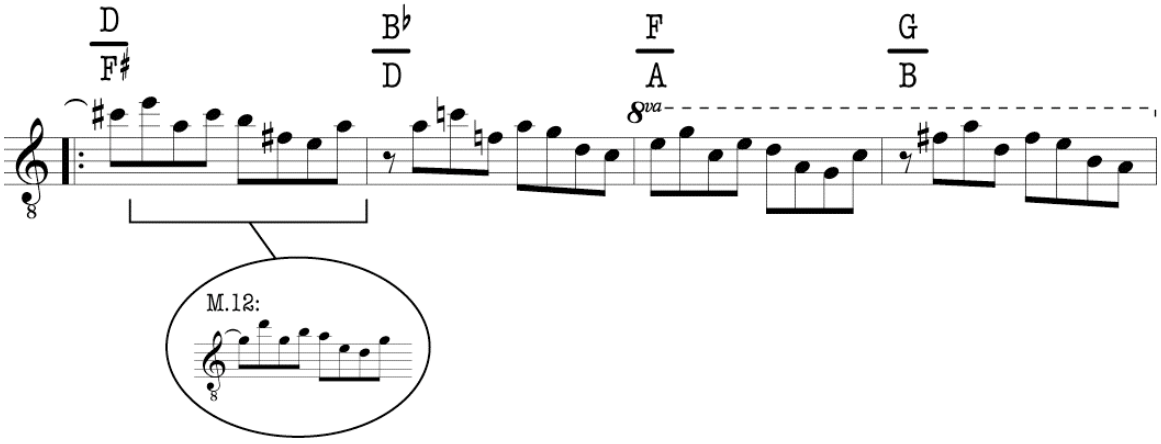
With these detailed analyses of the A Section's individual phrases, it is possible to identify a coherent structure for the tune—one that is anticipated by more local events throughout the section. The RTs used in this section are [G], [A♭], [G], [F], respectively. The recurrence of RT[G] helps me to prioritize it as most structural in the A Section, and I can understand RT[A♭] and RT[F] to function as neighbors—a large-scale manifestation of the tonic neighbor relationships presented by the melody in Phrases 1, 3, and 4. Further, the RT shift between [G] and [F] recalls the neighbor motion observed between the chords in mm. 1-2. Finally, the succession of RTs is anticipated locally in the "alto" of Phrase 1, as represented in my reduction in Example 5.5.

Let us now briefly turn out attention to the B Section of "Labyrinth." One of the most distinguishing characteristics of this section is its use of polyphony: during this section, the guitar's melody is accompanied by a counter melody, played by the tenor saxophone. Let us first consider the melody in the guitar, which is reproduced in Example 5.18, along with the accompanying chords.[244] The B Section's rhythms are regular and unsyncopated, its harmonies are consonant, and, excluding the three-measure transition at

[244] The example shows mm. 31-34, which are essentially repeated to make eight measures; these eight are then repeated to make 16.

the end, it is sixteen measures long (including the repeat), making for a rather traditional section, as mentioned in the opening of this analysis. There is also a consistency between non-adjacent chords in the section, since the chord in m. 31 is transposed up a minor third in m. 33, and the chord in m. 32 is transposed down a minor third in m. 34.

Example 5.18: Melody (gtr.) and harmony from B Section (mm. 31-34 shown)



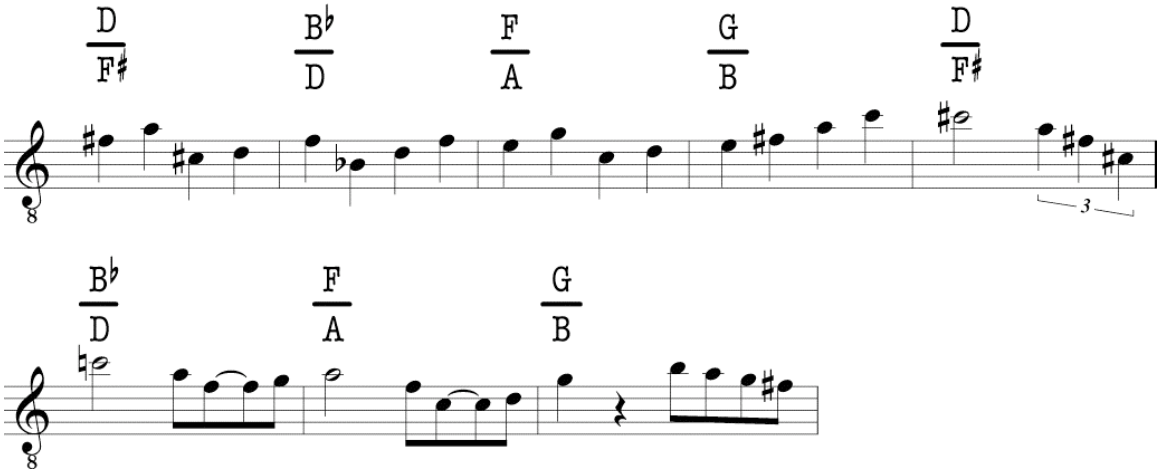
In certain ways, the B Section can be understood as derived from material used in the A Section. For instance, it specifies (through jazz slash notation) the use of major triads in first inversion—chords that appeared at various points throughout the A Section. Of these, it reprises the A Section's structural G/B, as well as B♭/D (both of which were heard in Phrase 3). Furthermore, the guitar's melodic motive used throughout this section is taken directly from m. 12, with the exception of the first pitch (highlighted in the lower portion of Example 5.18).[245]

Apart from the fourth chord in the series, G/B, initial considerations of the B Section's chords may not reveal a direct correlation to earlier material. In keeping with the more traditional nature of this section, therefore, it might seem sensible to analyze each chord as being generated by its own RS, and the root of each chord being its own

[245] The first pitch is a member of the triad that is being arpeggiated, but it is the third and not the root, which was the case in m. 12.

RT. This would be reminiscent of the B Section that is characteristic of "rhythm changes," which cycles through Mm7 chords whose roots are related by fifth. For instance, in a B♭ rhythm change, the B Section, or bridge, would be D7 → G7 → C7 → F7. Some musicians describe this as being a modified III → VI → II → V in the home key of B♭. Nonetheless, basic chord/scale theory permits cycling through Mixolydian modes for each corresponding chord when improvising. If taking a similar approach to the B Section in "Labyrinth," cycling through Ionian modes would accurately reflect the harmonic structure of the section. Indeed, such an approach is supported in portions of Rogers's solo over these measures. Example 5.19 shows an excerpt from Rogers's solo, and cycles twice through the four-chord series. It is clear that Rogers adheres quite closely to the underlying chord changes, as well as their respective generating sets.

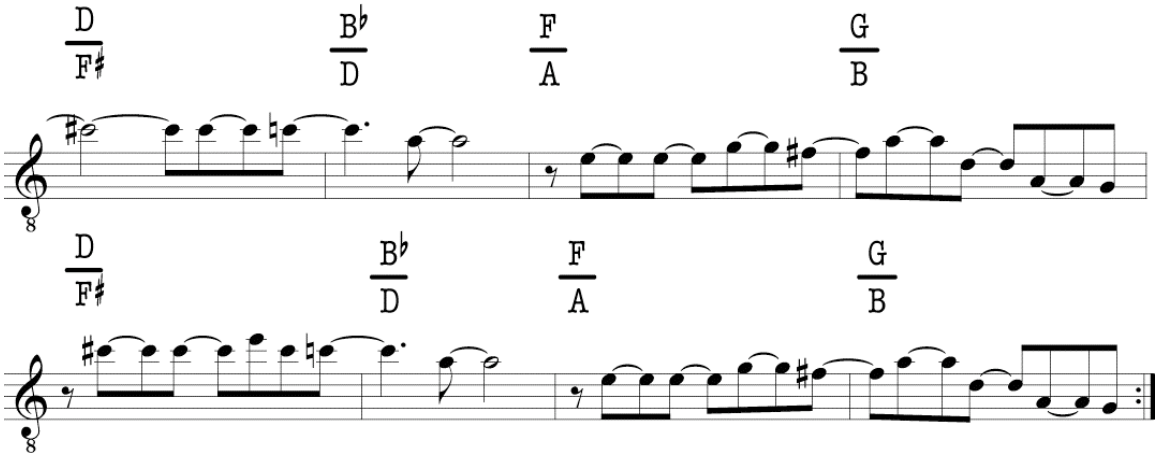
Example 5.19: Adam Rogers' solo, "Labyrinth" (B Section, ~2:22-2:29)



Given my analysis of the A Section, closer consideration reveals a direct correspondence between it and the B Section. For instance, the triads that border the four-chord series support RT[G], as well as the RS identified in Phrase 3, RS[G1]. The root succession between chords 3 and 4 reminds me of that identified between the chords in the first two measures of the tune, as well as between the RTs of Phrases 3 and 4, albeit in retrograde. Further, under a potential RT[G], the presence of a B♭ major chord in the B

Section recalls earlier uses of mixture in Phrase 1 (see footnote 234) and Phrase 3. In this case, it is possible to hear chords 1 and 2 as implying a V7 → I in G minor, with the seventh over D sounding in the saxophone melody, shown in Example 5.20. Lastly, and perhaps most telling, when considering these earlier uses of mixture, I understand the roots of the B Section's chords to be arpeggiating a Gmin7 chord. The combination of these factors supports a return to RT[G] in the B Section.

Example 5.20: Melody (sax) from B Section (mm. 31-38)

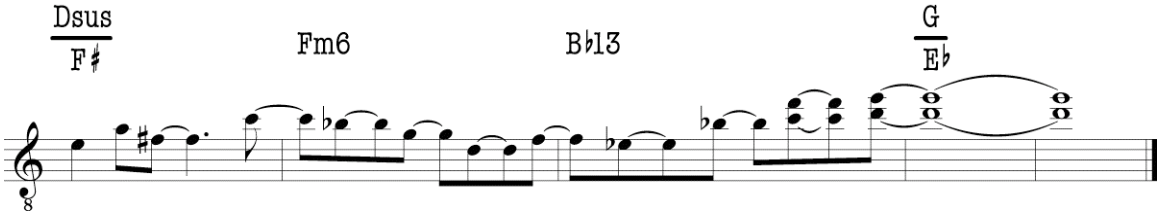


To get a grasp of the tonality across the entire tune, let us now consider the final A Section (mm. 42-59 on the lead sheet). It is the same as A1 and A2, with the exception of the end, mm. 55-59, shown in Example 5.21. In m. 56, the chord that closed both A1 and A2, Fmin6, reappears, supporting a retention of RS[F2], which I proposed for the final phrases in those sections. Now, however, it progresses in a traditional fashion to the only Mm7 chord of the entire tune, B♭13, suggesting the resolution to an E♭-rooted chord.[246] Indeed, E♭ occurs in the bass of m. 58, but not as expected. Instead, the expected resolution to E♭ is thwarted when Rogers gives us the chord G/E♭. A literal

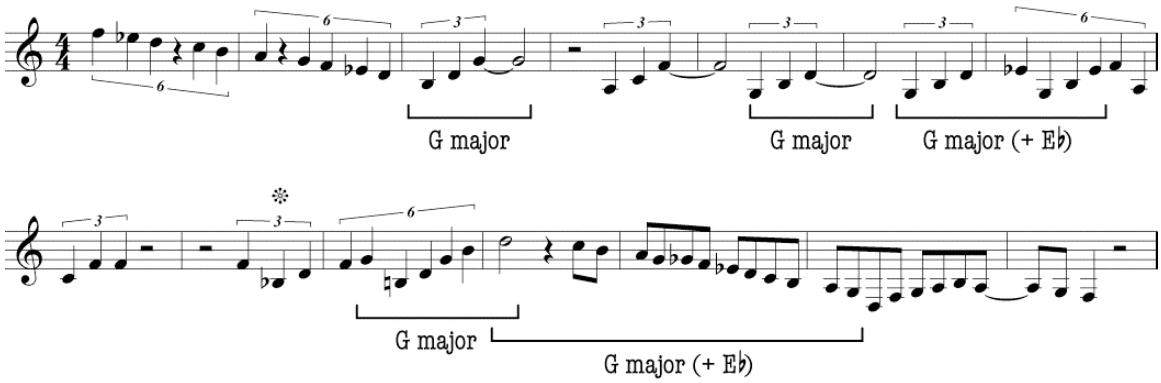
[246] Traditional chord/scale theory would propose F Dorian → B♭ Mixolydian for mm. 56-57. However, the prevalence of F, as suggested earlier, enables me to retain F as RT, and RS[F2], until B♭13 resolves.

reading of this chord yields E♭Maj7♯5, which is a subset of Lydian Augmented.[247] Indeed, this scale appears to be prevalent in Rogers's solo over the vamp, an excerpt of which is shown in Example 5.22. With the exception of B♭3 (highlighted by ❁), all his notes can be understood as belonging to E♭ Lydian Augmented. Alternatively, given my interpretation of chords used earlier in the tune, I can analyze G/E♭ as a G major chord with a subposed E♭. As a result, I can analyze the tune's closing cadential progression to resolve somewhat deceptively, so as to support the most prevalent RT in the tune, G. Indeed, the excerpt from Rogers's solo appears to highlight a G major triad at multiple moments, highlighted by the brackets in the example.[248]

Example 5.21: The end of the final A Section (mm. 55-59)



Example 5.22: Adam Rogers's solo, "Labyrinth" (vamp on G/E♭, ~1:04-1:17)



The preceding analytical observations demonstrate how persistent chromaticism and non-diatonic progressions in Adam Rogers's "Labyrinth" can be understood in

[247] This set is the third mode of melodic minor.

[248] A major scale with a ♭6̂ can also be understood as harmonic major.

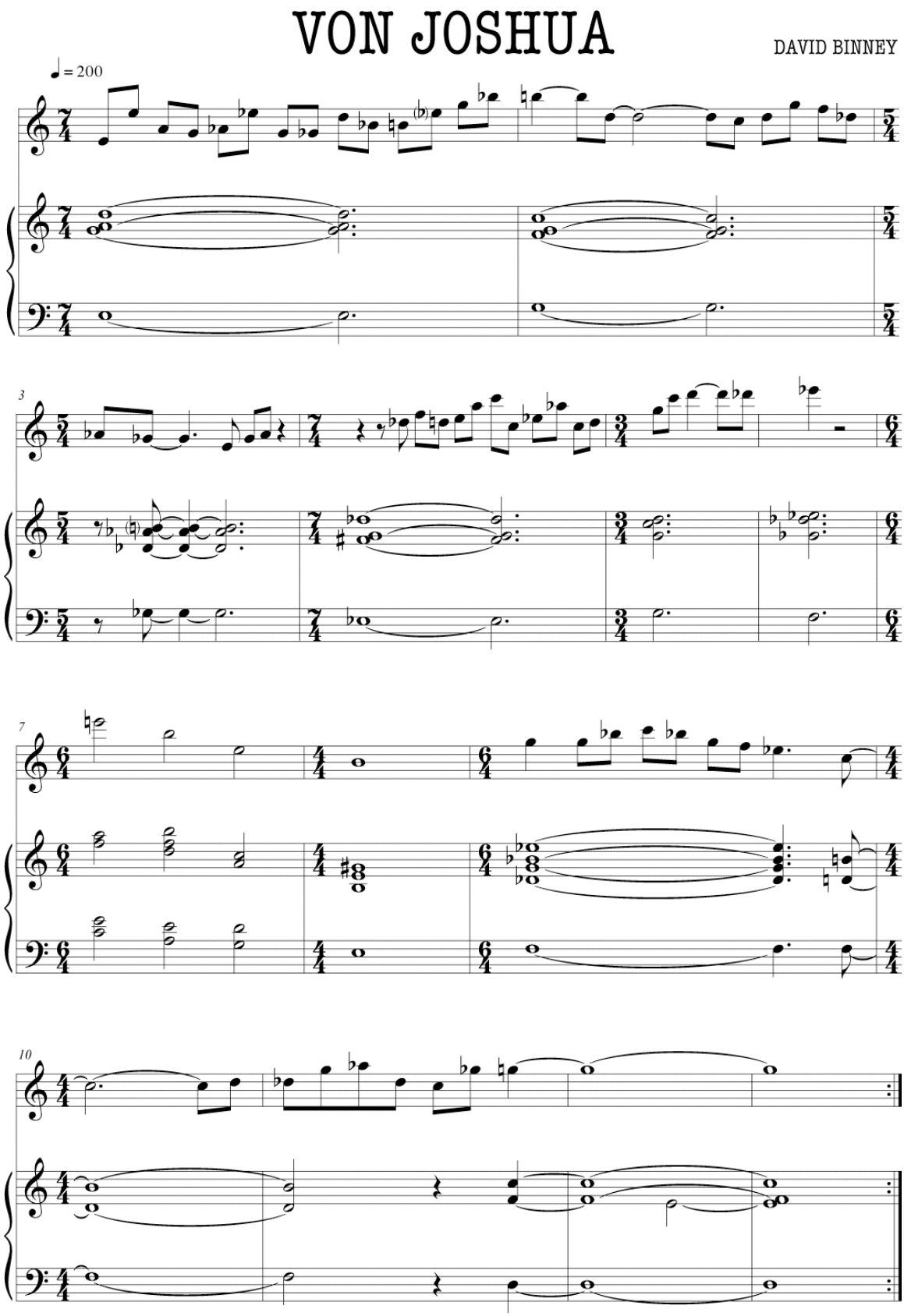
somewhat more traditional terms. Its A Section, despite its irregular formal structure, is organized into four distinct phrases. At times, chromaticism, including mixture, obscures the idea of a single set governing a given phrase. However, the retention of RT through such moments helps me to prioritize certain pitches over others based on their relationship to this RT, and to, therefore, interpret the chromaticism accordingly. Based on melodic characteristics, such as duration, contour, and conjunct motion, as well as harmonic characteristics, such as pitch-class inclusion and bass line patterns, I can extract a structural melody that governs each phrase. These melodies help to orient my hearing throughout larger portions of the tune. As a result, I can understand Adam Rogers's "Labyrinth" to be straightforward, relatively speaking, in terms of its structure, since the majority of the tune can be supported by a single RT.

DAVID BINNEY'S "VON JOSHUA"

Example 5.23 shows a lead sheet for the tune "Von Joshua," composed by New York-based alto saxophonist David Binney.[249] The tune is featured on the album *South*, (on ACT Music & Vision, 2001), and features Chris Potter (tenor saxophone), Adam Rogers (guitar), Uri Caine (piano), Scott Colley (bass), Brian Blade (drums), Jim Black (drums).

[249] David Binney, "Von Joshua," composed by David Binney, produced by David Binney (*South*, ACT Music + Vision ACT 9279-2, 2001). The lead sheet is transcribed from an original that was emailed to me by the composer. Note that beat 1, m. 1, has been slightly altered to more accurately reflect what is played on the recording (the original lead sheet has a triplet-sixteenth on the second half of the beat, with the notes <G_4, A_4, E_5>).

Example 5.23: Lead sheet for Binney's "Von Joshua"



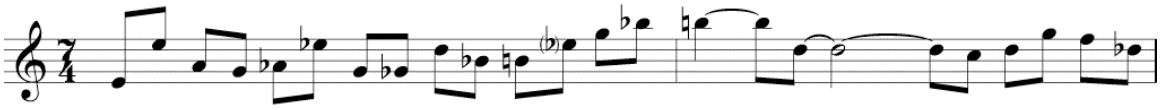
The form of "Von Joshua" is not a traditional one. It is irregular in its total number of measures, as well as in its metric design. In total, it has thirteen measures, as opposed to a more traditional multiple of four. Within these thirteen measures, the time signature changes seven times. The first two measures of 7/4 are divided by the melody's arrival on B_5, which breaks the initial stream of successive eighths. The first break in the melody occurs between mm. 3-4. There is a strong sense of arrival in m. 8, which will be discussed more fully below. However, because of the changing meter up to this point, my perception of this arrival has little do with the fact that it occurs specifically in m. 8—a point at which more traditional formal archetypes would cadence. In fact, the tune's upbeat tempo (notated on the lead sheet as ♩ = 200) makes it difficult to perceive any subsections within the thirteen measures, traditionally demarcated by cadences or cadential gestures, and in certain ways it sounds through-composed. Nonetheless, durational accents and melodic breaks help me to prioritize particular pitches and chords over others.

What is most striking about the lead sheet of "Von Joshua" is that, as opposed to all others included in this dissertation, it does not contain chord labels. Instead, specific voicings are provided on two staves below the melody. The lack of chord labels can pose an immediate challenge for both the analyst and the improviser. For the analyst, the absence of chord labels makes it necessary to distinguish particular chord identities, including roots, from the notated chords, as well as how these chords interact with each other and the melody. This challenge is further enhanced by the fact that few of the notated chords are straightforwardly tertian. For the improviser, the absence of chord labels means the absence of visual cues that might be provided by such labels—cues that represent, in a traditional sense, particular scales with which to improvise. As it happens, however, the solo sections in "Von Joshua" are intended to be free, meaning the

musicians "weren't following a form."[250] Perhaps this means that the musicians were ignoring the melody and chords of the head when improvising. In regards to the challenge that the lack of chord labels imposes on the analyst, Binney explained that the chords were composed "after the melody so as to color the melody in a certain way."[251] What he means by "color" is unclear, but his statement does validate the approach outlined in RS theory, which often involves looking at the melody prior to looking at the chords.

Following RS theory, the highly chromatic melody in "Von Joshua" can be heard to prefer particular pitches, as well as pc-groups. In the course of the tune, the melody utilizes all twelve chromatic pcs. However, as described below, specific pcs tend to behave in the same way. This enables me to attribute particular melodic functions to these pcs, and helps me to organize the otherwise completely chromatic melody. Example 5.24 shows the melody for mm. 1-2. The opening octave leap, from E_4 to E_5, initiates a stream of successive eighth notes that is interrupted by the durational accent on B_5, on the downbeat of m. 2. This pitch is also emphasized by contour accent since it is registrally the highest so far, and I understand it to be related to the opening E—which, itself, is emphasized by leap accent and repetition—by fifth. Accordingly, mm. 1-2 suggest the possibility of RT[E]. The corresponding RS, however, is difficult to determine on account of the intervening chromaticism.

Example 5.24: Melody, mm. 1-2

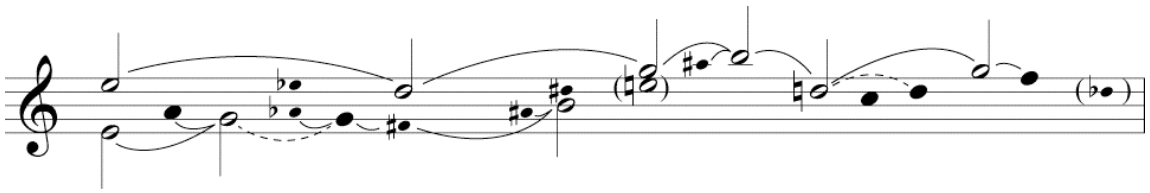


[250] David Binney, personal correspondence, June 14, 2011.
[251] Ibid.

Example 5.25 shows a productive way to understand m. 1 as a compound melody, which sets up a structure that continues into the second measure. The leap to E_5 that opens the melody initiates what I hear as the top voice, which descends chromatically to $E♭_5$ and then D_5. The lower voice, which starts on E_4, leaps up a perfect fourth to A_4, and then descends by step to G_4. G_4 is embellished by an upper neighbor, $A♭_4$. This embellishment helps me to hear the upper voice's E♭ similarly, and I analyze it as a chromatic passing tone between E_5 and D_5. In the example, I have respelled $G♭_4$ to $F♯_4$ since I hear it leaping up a perfect fourth to B_4, through an intervening $B♭_4$ (respelled as $A♯_4$), on beat six. This leap recalls the opening leap between <E_4, A_4>. B_4 then leaps, this time by diminished fourth, to $E♭_5$. However, I understand this leap as a misspelled major third, which arpeggiates B major and helps to reinforce my hearing of E as RT. The <B_4, $E♭_5$> dyad proceeds to G_5, under which I can imagine an implied tonic (represented by the $E♮_5$ in parentheses). The upper fifth of E minor (B_5) is then, again, approached from below by its leading tone ($A♯_5$). Thus, in this representation, both E and B are always presented alongside a chromatic pitch that is a semitone below. B_5 then leaps down to D_5, which is momentarily embellished by a lower neighbor (C_5) before leaping a perfect fourth to G_5. The extended duration spent on D_5 in the second measure helps me to hear this pitch as important. As a result, and consistent with Heuristic 5 (the RS should include a clearly articulated tertian collection whose root is the RT), I hear an Emin7 chord extended across mm. 1-2, and so I represent its members (E, G, B, D) with stemmed open noteheads in the upper voice. The leap from B_5 to D_5 (m. 2) is, thus, understood as a chordal skip within Emin7. Finally, G_5 steps down to F_5. I hear the final $D♭_5$ as anacrustic to the chord change in m. 3, and so the example shows this pitch in parentheses.[252]

[252] Heuristic 4 states that the RS should support the grouping structure of the tune. I do not mean to suggest that mm. 1-2 comprise a single group here. However, as already noted, subsections in this tune are difficult to perceive, and so I am simply presenting a moment-to-moment analytical account.

Example 5.25: (Compound) structural melody, emphasizing Emin7, and suggesting RT[E] (mm. 1-2)

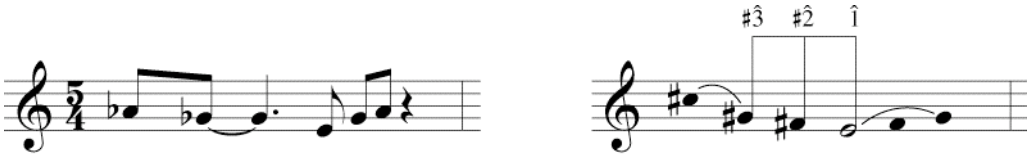


Pitch prioritization across mm. 1-2, as represented in Example 5.25, indicates a minor mode that is comprised of white keys (a preference that is influenced in part by the chords in these measures, which will be discussed below). Therefore, taking into consideration Heuristic 6 (wherever possible, prefer diatonic collections), I am positing RS[E3] as the governing set for mm. 1-2. Accordingly, non-RS members are represented in Example 5.25 with smaller noteheads. Both F♯$_4$ and A♯$_4$ are shown as non-members, though these are analyzed as having a secondary relationship with $\hat{5}$, suggesting a momentary tonicization.

As the tune progresses from m. 2 into m. 3, it appears that RS[E3] is no longer active. D♭$_5$, which is heard on the final eighth of m. 2, leaps down a perfect fourth to A♭$_4$—another instance of this now seemingly characteristic interval. Apart from E$_4$, none of the ensuing melodic pitches are consistent with RS[E3]. However, Example 5.26 shows how, despite this chromaticism, RT[E] remains emphasized. Specifically, I hear E$_4$ as the goal of a brief descending line that, once reaching its goal, climbs back up again. Given the limited amount of information in the melody, the referential set in this measure is unclear, though both G♭ and A♭ were heard in the tune's opening measure. Therefore, through continued enharmonic reinterpretation, shown in the right-hand side of Example 5.26, I hear this measure as comprising $\sharp\hat{3} \rightarrow \sharp\hat{2} \rightarrow \hat{1}$. This implies a modal shift from minor (mm. 1-2) to major (m. 3), but I retain my sense of RT[E]. Thus, I can understand both a single RT and a chromatically altered RS to be prolonged through the opening three measures. Since m. 3 includes the first melodic break, this prolongation can be

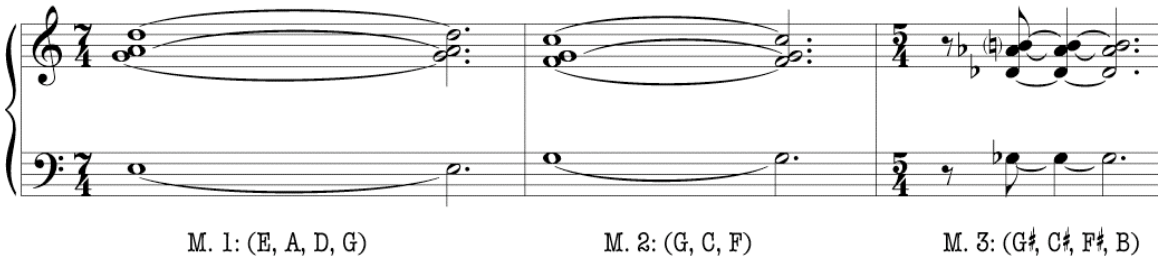
understood as supporting Heuristic 4 (the RS should support the grouping structure) in a tune that otherwise does not have any clearly articulated sections.

Example 5.26: Melody in m. 3, supporting the continued preference for RT[E]



The significance of the perfect fourth is also evident in the underlying chords of the opening three measures. The chords in all three measures can be described as quartal, consisting exclusively of stacked perfect fourths.[253] This structure is evident in Example 5.27, which shows the lower two staves from the lead sheet. Beneath the example, the pc content of each chord is shown, arranged as ascending perfect fourths. In mm. 1-2, the lowest note in the ordering corresponds to the bass note on the lead sheet; in m. 3, this is not the case.[254]

Example 5.27: Quartal chords used in mm. 1-3



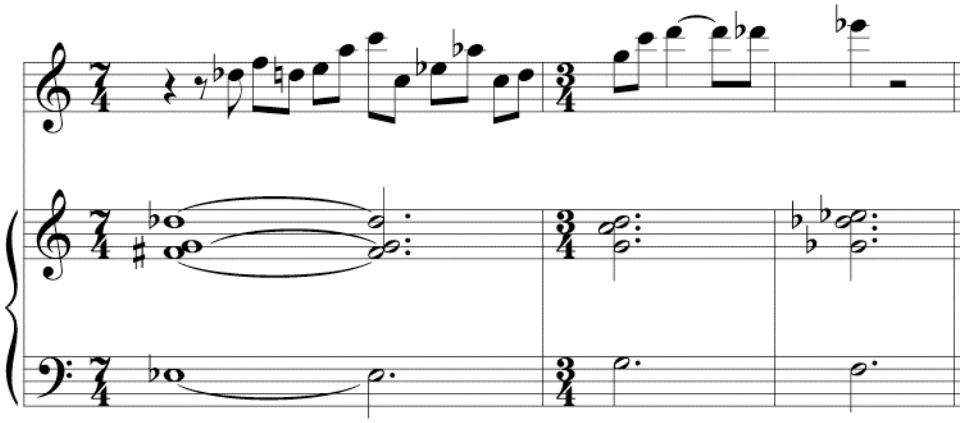
[253] Binney's use of quartal chords is another instance of the tune's seemingly characteristic perfect fourth. It should be noted that Keith Waters includes "the prominent use of harmonic and/or melodic perfect fourths" among the characteristic features of the modal jazz style. As mentioned in Chapter 2 of this dissertation, modal jazz is considered a stylistic precursor to a lot of contemporary jazz writing. See Keith Waters, *The Studio Recordings of the Miles Davis Quintet, 1965-68* (New York: Oxford University Press, 2011), 46.

[254] Note that, in following my analysis of the melody in m. 3, some of the notes in m. 3's chord have been enharmonically respelled in order to represent them as true perfect fourths.

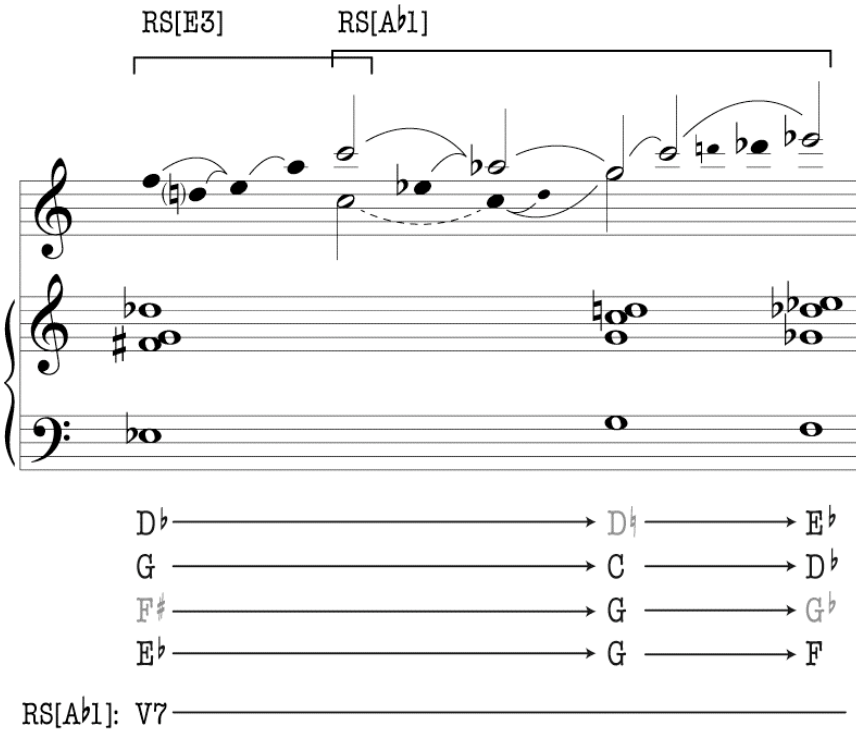
Like the structural melody, the chords in mm. 1-2 support the white key collection. In fact, across these two measures, every note in this RS except for B ($\hat{5}$ in RS[E3]) is used in the chords. The presence of F_4 in the chord of m. 2 helps me to prefer this pc over the melody's $G\flat_4$ (shown in Example 5.25 as $F\sharp_4$) as an RS-member, and so the latter pitch is represented as a smaller notehead in Example 5.25. These chords can provide further support for my structural analysis of the melody since the chord in m. 1 is, essentially, an Emin7 chord with an added eleventh: <E, G, D, A> = <root, third, seventh, eleventh>. (Consistent with standard jazz harmonic theory, the absence of the fifth in no way spoils the identity of this chord.) The bass line in mm. 1-2 also supports E minor as a referential sonority, since it can be analyzed as progressing from root to third of E minor. Accordingly, these observations confirm my preference for RT[E], as well as RS[E3] in the first two measures of the tune. The chord in m. 3 can be analyzed as supporting the modal shift posited in the melody, since this chord contains members of an E major collection, including $\hat{3}$ ($A\flat = G\sharp$). In fact, when considering both melody and chord together in m. 3, I can identify a complete E major pentatonic collection, <E, F♯, G♯, B, C♯>. Therefore, under the concept of inclusion, I can retain my understanding of RT[E], despite the change of mode.

The fourth measure of "Von Joshua" initiates what sounds like a consequent phrase to the opening antecedent. The return of a continuous-eighth-note attack in the melody, supported by a long-duration chord, encourages this hearing. Example 5.28 presents mm. 4-6, and Example 5.29 shows the structural melody of mm. 4-6, as I understand it.

Example 5.28: "Von Joshua," mm. 4-6



Example 5.29: (Compound) structural melody, emphasizing A♭Maj7, and chords, supporting RS[A♭1] (mm. 4-6)



The melody here uses pitch material similar to that of the opening measures, recalling the white key collection that was prominent in mm. 1-2. Example 5.29 shows how both F_5 and D_5 act as incomplete neighbors to E_5, which then leaps by perfect fourth to A_5,

reminding me of the lower voice that opens m. 1 (Example 5.25).[255] However, partially as a result of the chords, I quickly recognize a shift of RT as well as RS in these measures. Pitch-class C is emphasized, both by contour (as the highest pitch in the measure), as well as by octave leap. Following this, C takes part in an arpeggiation of A♭ major. Hearing an arpeggiated A♭ triad over an E♭-rooted chord encourages the aforementioned shift, and I hear C as a pivot between two referential sets. More specifically, I understand C to function as a third divider between the sets whose RTs are [E] and [A♭], respectively. $A♭_5$ then steps down to G_5, the chordal seventh over A♭, which then leaps to C_6. C_6 steps through D♮ to D♭ before completing its ascent on $E♭_6$. Thus, Example 5.29 shows how the structural melody in mm. 4-6 is, essentially, an arpeggiated A♭Maj7, just as that in the first two measures arpeggiated Emin7. Accordingly, the example represents these chord members with stemmed open noteheads.

Further support for RT[A♭] comes from the chords, which I essentially hear as a prolonged E♭7, or V7 of A♭. I can, therefore, determine the referential set to be RS[A♭1]. For clarity, pc names are included under the staves in Example 5.29. The chromatic chord in m. 4 is clearly derived from E♭7, but contains both the major and minor third, G♮ and G♭ (= F♯), respectively.[256] The bass line moves through members of RS[A♭1], <E♭, G, F>, and, despite its irregular inversion, I hear the chord in m. 6 as continuing the E♭ chord from m. 4; the prominence of E♭ in this measure is supported by the melody. The melody's $<C_5, D_5>$, heard at the end of m. 4, is transferred up one octave in m. 5, preceded by the perfect fourth leap from G_5. D_6 then proceeds to $D♭_6$. The voice leading <G, C, D♭> is also present in the "alto" voice of the underlying chords. This helps me to

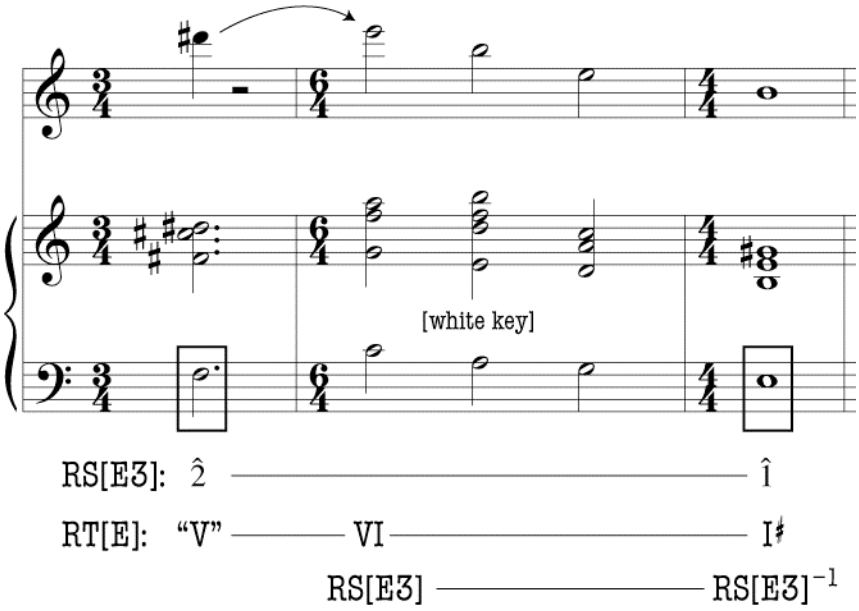
[255] The melody's $D♭_5$ is not a member of RS[E3], but is a member of the underlying chord at this moment. The conflict between RS[E3] and the chord results in a shift of RS, described above. For these reasons, I am leaving $D♭_5$ out of my melodic reduction.
[256] Despite the chord's arrangement, F♯ could be analyzed as the ♯9, which is not an uncommon alteration in dominant chords.

prioritize pc D♭ over pc D♮, supporting the idea that these measures are governed by RS[A♭1].

Given the analytical observations made thus far, I can understand the opening six measures of "Von Joshua" as governed by the RT series RT[E] → RT[A♭]. This shift of RT, a diminished fourth relation, reminds me of local events heard early in the tune, most notably the modal conflict identified between mm. 2 and 3. Thus, this RT shift highlights the major/minor conflict when a minor-mode set shifts to a set whose tonic is a *major* third higher, RT[E] → RT[A♭].

In certain ways, the next two measures (mm. 7-8) are the most distinctive in the tune, as well as the most referential. Following the preceding measures, these present a return to the white key collection that was shown to be prominent in the tune's opening. The attack density across these measures decreases considerably, and the melody's E_6, the highest pitch in the tune, supports this moment as climax, as does the highly apparent textural change. Example 5.30 presents an annotated excerpt from the lead sheet for mm. 6-8. Starting in m. 7, the melody descends from root to fifth, E_6 to B_5 and then E_5 to B_4, emphasizing those structural pcs that initially attracted my attention in mm. 1-2. This return to E forces a reinterpretation of the role of m. 6's $E♭_6$, and I can hear it as a respelled D♯, the leading tone of RT[E]. In lieu of this, Example 5.30 includes m. 6, but respells $E♭_6$, as well as some of the chord members that support it. The presence of a leading tone invokes a type of quasi-dominant function on m. 6, and so the example shows "V" underneath the staves.

Example 5.30: The climax of "Von Joshua," supporting a return of RT[E]



RT[E] is finally reestablished by the arrival of E major in m. 8—the only tertian chord in the whole tune. Following Heuristic 5 (the RS should preferably include a clearly articulated tertian collection whose root is the RT), I can hear m. 8 as making explicit the tune's most referential pitch, RT[E], which is also emphasized by durational accent. The major quality of this tonic chord is but another example of modal mixture, observed earlier in the tune. More notably, however, it helps to highlight the "conflict" between the two RTs identified thus far, RT[E] and RT[A♭]. In this regard, I can imagine the E-rooted chord in m. 8 to comprise the notes <E, A♭, B>, at least in the abstract. Also, because I hear m. 8 as an arrival, I can connect it with the previous arrival heard at m. 6. The example places boxes around the bass notes in mm. 6 and 8, and labels them as $\hat{2} \rightarrow \hat{1}$ in RS[E3], a characteristic gesture of this particular mode.

Prior to m. 8, the white key collection is supported by the chord series in m. 7, which includes every member at least once.[257] The modal shift at m. 8, therefore, does not detract from my sense of RS[E3] as the most prevalent set, but simply recalls the earlier alterations.

The first chord in m. 7, C major, also has significance. Recall that the melody's C in m. 4 acted as a pivot between RS[E3] and RS[A♭1]. In m. 7, I can understand a similar role for C, as RS[A♭1] transitions back to RS[E3]. However, the complete C major triad highlights the chromatic mediant relation that seems to exist between the tune's two most significant RTs. Specifically, because C major is not an explicit subset of RS[A♭1], I can understand its role as pivot to be chromatic, and implying the chord series A♭ major → C major → E minor.

The significance of mm. 7-8 is affirmed in the rest of the recorded performance: the end of every solo is cued by a restatement of mm. 7-10. Because of this recurring restatement, I will call these measures, which include the climactic mm. 7-8, the refrain. As part of this refrain, following m. 8, Binney brings back the E♭ chord heard in m. 6. However, instead of invoking a shift back to RS[A♭1], I hear this chord as having a more traditional function. Specifically, I hear this chord as a tritone substitute for A7, the dominant of D minor, which arrives at the end of m. 9.[258] This is shown in Example 5.31. The arrival of this latter chord helps my hearing of the former, and as a result, does not detract from my hearing the white key collection as most prevalent.

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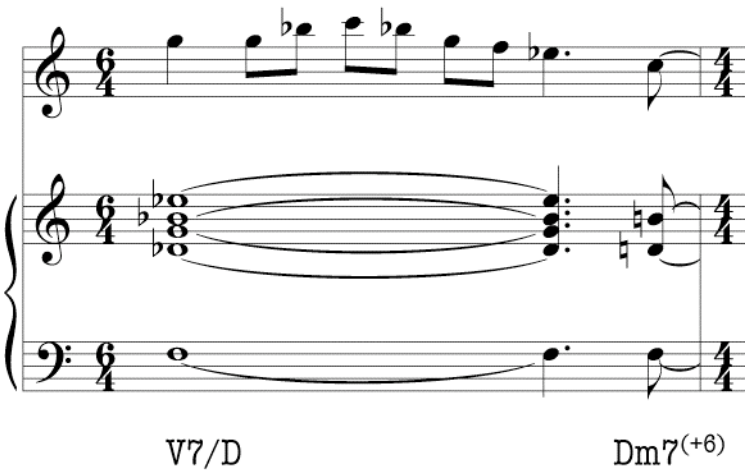
[257] Note how the superscripted –1 beside RS[E3] in Example 5.30 signifies that one member of the set has been altered (G → G♯).

[258] Literally, this chord is a first inversion Dmin7 with an added sixth. More importantly, however, it is an exclusively "white-key" chord. Thus, under the concept of inclusion, continues RS[E3] from mm. 7-8.

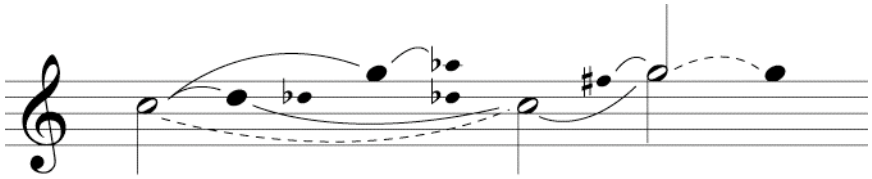
Example 5.31: E♭7 as tritone substitute for V7/D (m. 9)



Following m. 9, RS[E3] can be understood to persist through the end of the tune. All the chords in the final four measures are white-key chords, and thus support RS[E3] through the concept of inclusion. Example 5.32 shows that the melody of mm. 10-13 recalls mm. 1-2, not only by using members of the governing set, but by using non-members in a similar way. Because of the long duration on C_5, followed shortly thereafter by a long duration on G_5, I hear this melody as based on C major. This is opposed to Emin7, which was the structural basis for those melodies described earlier, and reminding me of the importance of C as the structural pivot between the RT[E] and RT[A♭]. C_5 moves up by step to D_5 and then descends through a chromatic $D♭_5$ before leaping up to G_5. G_5, initially heard as part of an upper voice, is embellished by a chromatic double neighbor figure, $A♭_5$ and $G♭_5$ (the latter respelled in the example as $F♯_5$). The double stem on G_5 in the example shows how both voices converge on this pitch, which is then sustained through the final two measures of the tune. It seems to me that, by placing this emphasis on G at the end of the tune, Binney definitively affirms the mode of the tonic sonority, E minor, which had been altered on two occasions earlier by modal mixture. Further, by adding E_4 in the penultimate measure's chord, Binney not only brings back

the tune's RT, but also highlights the characteristic ♭$\hat{2}$ → $\hat{1}$ Phrygian motion between F and E, confirming the mode of the tune's most referential set.

Example 5.32: Structural melody of mm. 10-13, recalling earlier material



Having determined the most structural notes, we can now see that many of the non-RS[E3] members tend to behave in consistent ways throughout the white-key passages in "Von Joshua." For instance, though never notated as A♯, pc B♭ nearly always moves up to RS-member B. The only exception comes in m. 9, when the melody arpeggiates the underlying E♭7 chord, and the B♭ that is actually in the chord (B♭$_4$) does voice-lead to B♮. Similarly, pc E♭, when used in the melody, nearly always proceeds by semitone to either E♮ or D♮.[259] Pitch class A♭ is always connected to RS-member G, just as pc D♭ is almost always adjacent to RS-member D♮. Finally, pc G♭ is always immediately adjacent to RS-member G♮, except in m. 3, where it is better understood as F♯ (as described earlier, Example 5.26). By identifying these relationships, I can understand many of the non white-key notes to be chromatic alterations of members of RS[E3], adhering to Heuristic 3, and emphasizing it as the most important set in the tune.

The solo sections in "Von Joshua," as mentioned earlier, are free. According to Binney, "Von Joshua" was composed specifically as "a vehicle for improvisation over a fast groove."[260] The entire solo section retains the common time of the tune's last four

[259] Like B♭, the only exception is in m. 9, where E♭$_5$ is surrounded by F$_5$ and C$_5$. The chord in this measure, as already shown, uses E♭ as a chromatically-related neighbor to the more structural RT[E]. Therefore, the melody's E♭$_5$ can be similarly described.
[260] David Binney, personal correspondence, June 14, 2011.

measures. Further evidence that the ensemble was not following the original lead sheet during the solos can be observed in the length of their individual improvisations. For instance, Adam Rogers's solo—the end of which is signaled by a statement of the refrain—lasts for 112 measures. If following a traditional structure, this would comprise seven sixteen-measure choruses.[261] However, because the refrain enters part way through the original form, seven full choruses, totaling one-hundred-and-twelve measures, would not align. More specifically, if "Von Joshua" were set in common time throughout, it would total sixteen measures (as opposed to thirteen). In such a setting, the refrain, which cues the end of the solo, would begin in m. 9. Therefore, if following a sixteen-measure form, I would expect Rogers's seven-chorus solo to end after one-hundred-and-four measures, since 6 x 16mm = 96mm, followed by 9mm to refrain. Therefore, it is likely that the individual solos ended, and the restatement of the refrain was made, on cue.

Given such freedom, it seems unreasonable to expect that RS theory would describe the solos, and indeed, the improvisations do not adhere to the referential set that was posited for the head. Indeed, the musicians may have considered it an opportunity to deliberately distance themselves from any referential material in order to, perhaps, increase the tension and excitement in their individual improvisations. Rogers, for instance, immediately emphasizes pitch material that was not prominently featured in the composed portion of the tune. Example 5.33 shows his opening.[262] Not until m. 10 does he seem to prioritize members of the white key collection, corresponding with RS[E3].

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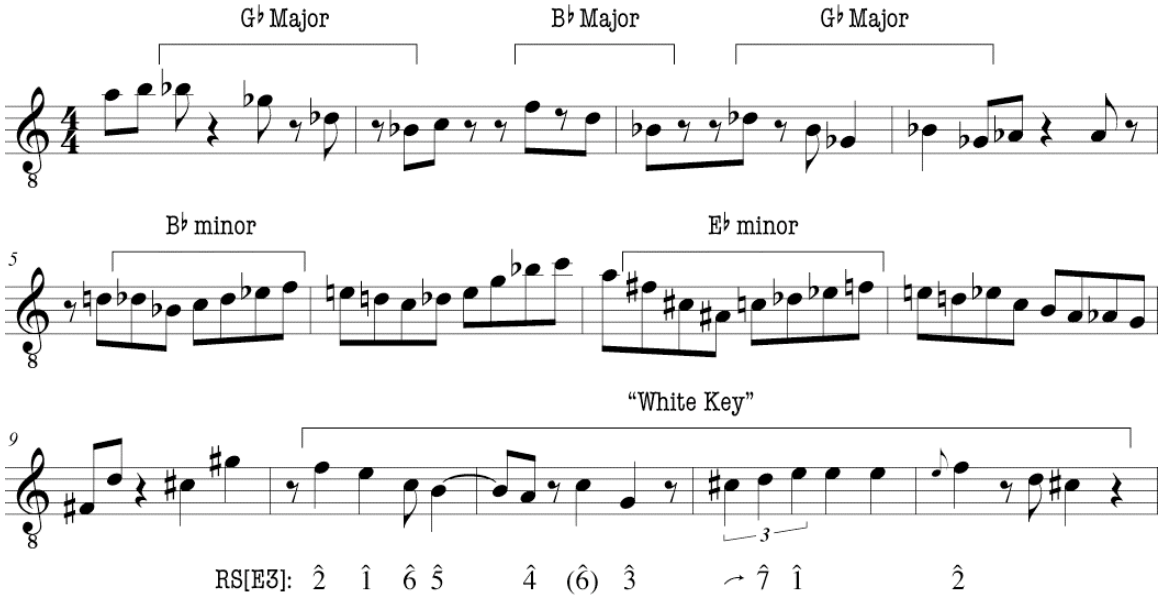
[261] The original lead sheet that I received from Binney was composed as 16 measures of 4/4. However, he renotated it as shown in Example 5.23, claiming that this arrangement was "easier to read in some way" (Binney, personal correspondence, Dec 17, 2011). Given the original metric design, it would not be inappropriate to assume that the musicians were following a similar archetype during their solos, at least partially, when/if counting measures.

[262] Adam Rogers, "Von Joshua," composed by David Binney, produced by David Binney (*South*, ACT Music + Vision ACT 9279-2, 2001).

During the final four measures of the example, a case could be made that he is supporting RS[E3], where his line begins with a Phrygian $\flat\hat{2} \rightarrow \hat{1}$, followed by a $\flat\hat{6} \rightarrow \hat{5}$ gesture (a transposition of the former by descending perfect fourth, and a characteristically minor-mode gesture) and a step down to $\hat{3}$. There is a brief emphasis on E_5 by repetition, highlighting this pitch as the most important of the line.

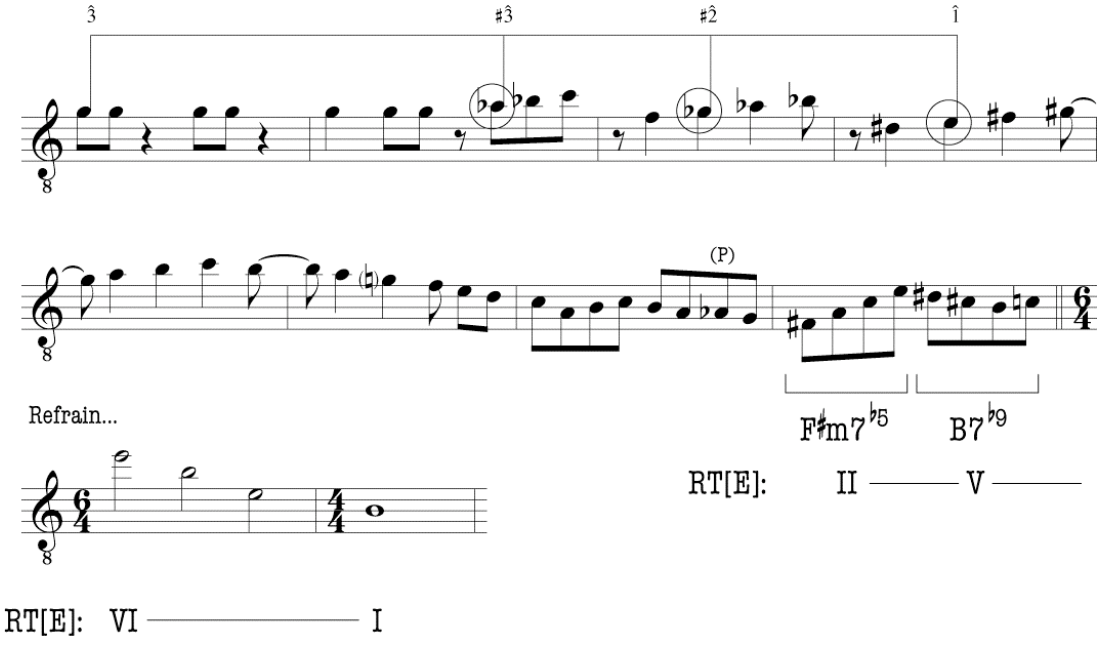
Example 5.33: Adam Rogers's solo, "Von Joshua" (~0:28-0:39)



Despite the evidence that the musicians are not restricting themselves to *any* particular referential collection, let alone RS[E3], the ways in which they prepare to end their solos suggest the possibility that they are conceiving of one for the tune's head. For instance, Example 5.34 shows the final eight measures of Rogers's solo, leading into the refrain. The opening G_5 is prolonged, and emphasized through repetition. This pitch then rises by semitone, becoming the leading tone to $A\flat_5$ in the second measure of the example. This semitone rise initiates a motive that carries over into the following two measures. What the example shows is how it is possible to hear E_5 (m. 4) as a structural goal of a descending line that starts on G_5, which then moves up to $G\sharp_5$ through mixture, before descending to E_5 through a passing $F\sharp_5$. This hearing recalls events from the head

in which E is understood as a goal, but its mode is unclear. Continuing on, mm. 5-7, with the exception of $G\sharp_5$ (m. 5) and a passing $A\flat_4$ (m. 7), Rogers plays only members of RS[E3], with the fifth emphasized at the uppermost part of the line, and embellished with an upper neighbor, C_6 (another instance of $\flat\hat{6} \rightarrow \hat{5}$). Finally, and perhaps most telling, is how Rogers's final measure clearly outlines a traditional II → V progression towards E. As a result, when the refrain comes in, I can understand Rogers's solo to end deceptively through the progression B major → C major. Therefore, despite deviations that might occur throughout his "free" solo, it seems quite clear that Rogers is attempting to reinstate what might be the most prevalent sonority of the pre-composed tune so as to not make the entrance of the refrain seem jarring. This is similarly the case in the conclusion of Binney's solo. As opposed to Rogers, Binney concludes his solo on a single, prolonged pitch, B_5. He sustains this single pitch for about twelve seconds before the refrain enters. Because the first note of the refrain's melody is E_6, I can hear Binney's final note as the dominant pitch—a dominant prolongation—with "resolves" to the tonic. Like Rogers, it would seem as though Binney is preparing the return of composed material by explicitly setting up RT[E].

Example 5.34: Adam Rogers's solo and start of refrain, "Von Joshua" (~1:55-2:04)



As noted in the opening of this chapter, the chromatic complexity of contemporary jazz tunes, such as those included in this chapter, requires some flexibility in the application of referential set theory. In Binney's "Von Joshua," for instance, normative cues, such as cadential gestures and clearly articulated formal boundaries, do not appear, due to frequent deviations from a prominent pc-set within the non-traditional setting. Without such cues, it is difficult to hear melodic emphasis and chordal content as definitive of an RS. As a result, the continuity that an RS can provide for the listener and improviser is represented only sketchily by the persistence of an RT. Accordingly, the significance of the RT is heightened above that of its corresponding set. In circumstances such as this, musicians might more freely manipulate the pc material around a single pitch that they believe to be referential. This seems to be the case in the improvisations discussed in "Von Joshua." Within a solo section that is essentially free, both Rogers and Binney clearly prepare a return to more familiar pitch material. But this material, and their manner of preparation, seems directed toward RT[E], though not necessarily RS[E3]. Nonetheless, the preceding analysis showed how the composed portions of Binney's "Von Joshua," despite its non-traditional form, chords, and chromatic melody, privilege a particular collection of notes. Among these notes, a single pitch receives the greatest emphasis, both in the structural melodies, as well as the root of the only tertian chord heard in the tune.

As observed in both Rogers's "Labyrinth" and Binney's "Von Joshua," conflict between a determined RS and its non-members occurred as a result of mixture. In such cases, shifts between major and minor do not detract from the RT, supporting those statements made in the preceding paragraph. As these artists are prominent members of today's jazz scene in New York City, perhaps we can conclude that mode mixture is a characteristic feature of current compositional trends. In any case, the analyses contained in this chapter, as well as preceding chapters in this dissertation, demonstrate the

applicability of RS theory by articulating a process through which we can contextualize such chromaticism both economically and musically.

CHAPTER 6
PLAYING THE THEORY

In the opening chapter, I mentioned that this research was motivated by my desire to reconcile my preferred approach to playing and improvising on some complex jazz tunes, particularly those of the last few decades. In essence, therefore, as a theorist and a performer, my objective was to combine both branches of jazz theory outlined by Henry Martin, the "musician-based" and the "analytical". Accordingly, this dissertation advances an eclectic approach to analyzing jazz tunes—one that draws upon familiar concepts of traditional jazz pedagogy and theory such as chord/scale theory, but that circumvents their limitations for describing important contemporary jazz repertoire. Thus, I borrowed concepts that are more commonly found in the analysis of classical repertoires, such as Schenkerian and transformational theory, and other methods that could be applied in the analysis of nineteenth-century chromaticism. A final question to consider, therefore, is how well this research achieved my goal.

Generally, engaging myself in this research project had great personal benefits. It allowed me to stay connected with my instrument, as I often had my guitar in my hands while analyzing the music—a connection that I missed during much of my previous work as a theorist. Further, since transcription is an important means of expanding one's jazz vocabulary,[263] my examination of great artists' solos not only furthered the work in this dissertation, but also offered me, as a continuing student of jazz, practical gains as a musician.

[263] "The actual practice of transcribing solos from recorded performances is one widely recommended by jazz pedagogs [sic], not as a means of expanding a player's repertoire, but as a means of developing his improvisational skills." Smith, "Homer, Gregory, and Bill Evans?," 63.

More specifically, formalizing my theory has also helped my playing by forcing me to rationalize my practical approach, even as it applies to less chromatic, more traditional tunes. For instance, my *concept of inclusion* has encouraged me, while I comp through successions of lead-sheet chords, to continuously conceive of pitch groupings outside of the "stock" chord shapes that are common to guitar practice.[264] This research has also helped me to improve as a guitar instructor:[265] in the process of formalizing my own approach to playing, I've learned to communicate this approach to my students in such a way that they can more clearly comprehend it and apply it to their own playing situations.

In light of these benefits, one possible way in which the current study could be expanded is by testing its applicability as a coherent improvisational method. Because the manner in which RS theory is applied in this dissertation is post-improvisation, it appears to more firmly reside on the "analytical" branch of jazz theory.[266] Therefore, testing its applicability as a model for approaching the act of improvising would complement the present results. Testing methods could include, for instance, providing musicians with the heuristics prior to providing them with chord succession over which they were to improvise. Alternatively, providing musicians with a variety of non-diatonic chord successions and asking the musicians to rank pitch-class members of the aggregate hierarchically in reference to these successions may reveal whether or not they hear a

[264] Playing non-stock shapes as an attempt to accommodate, for instance, secundal chord voicings is a characteristic of my own comping style. However, the *concept of inclusion*, as described in this dissertation, was my first attempt at formalizing it as a conceptual approach.

[265] I have taught guitar professionally for eleven years.

[266] Recall that, according to Martin's distinction, "analytical" theory takes "a listener's rather than a musician's point of view." Martin, "Jazz Theory," 2.

consistent referential set embedded within the succession. Such tests could support the relevance of RS theory as a pedagogical tool, the likelihood of which I think is high.[267]

Applying RS theory as an improvisational method suggests inquiring into the cognitive processes involved while jazz musicians improvise—a study that might intersect in interesting ways with existing research in this area. For instance, Philip Johnson-Laird presupposes that the mental process involved in improvisation is computable, and it therefore should be possible to replicate this process using a computer program.[268] He outlines three possible algorithms that govern the act of improvisation, the feasibility of which are dependent on the amount of strain they impose on one's working memory. This takes into account a musician's familiarity with the musical genre, and their prior exposure to familiar chord successions and melodic patterns. However, the repertoire on which his study is based is tonal and, therefore, does not include chord successions such as those included in this dissertation. As a result, the mental process involved when improvising over the types of chord successions found in contemporary jazz may not be so easy to compute. Nonetheless, adherence to the heuristics outlined in this dissertation might suggest a similarly algorithmic approach to the improvisational act. Alternatively, Ed Sarath considers how an improviser perceives and experiences temporality.[269] By claiming that the improvisational act occurs within a heightened awareness of the present, or "in the moment," so to speak, Sarath can contrast this with the act of composition, which he argues occurs in a discontinuous temporal space—one

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[267] In adhering to Martin's definition, RS theory would more accurately be described as a "speculative" musician-based theory since "it assumes knowledge of rudiments and purports to suggest creative strategies musicians may wish to pursue as either writers or improvisers." Ibid.

[268] P. N. Johnson-Laird, "How Jazz Musicians Improvise." *Music Perception* 19.3 (2002), 415-442.

[269] Ed Sarath, "A New Look at Improvisation." *Journal of Music Theory* 40.1 (1996), 1-38.

in which the composer may reflect upon or even revise their work. Of course, because improvising is a learned activity, one may question the level to which any given improvisation is taking place "in the moment". Testing the applicability of RS theory would involve learning the heuristics by which it is governed, and is, therefore, a discontinuous act.

Another way that the current research might be expanded would be to consider its applicability in even more chromatic, and less constrained, repertoires. This might include, for instance, free jazz. Both Steven Block and Keith Waters have analyzed music in this genre using traditional pitch-class set theory.[270] Block demonstrates how Cecil Taylor applies additive and subtractive operations to short, melodic motives by inserting or removing notes from their middle. By retaining the outer members of the motive, the original motive remains recognizable, but its length has changed. Block also describes a process of pc-condensation, by which the intervallic structure of a set is continuously modified, resulting in new sets (for instance, [0167] is transformed into [0156], and then [0134]—the semitones are retained, but the interval that they border becomes gradually smaller). Similarly, Waters provides a variety of examples from John Coltrane's composed and improvised music on the album *A Love Supreme* (1964), which clearly make use of set-class [025]. In the terms of the theory presented in this dissertation, set-class [025] might be identified as a referential set in Coltrane's music.

Though enlightening, the works considered by both Block and Waters were composed between 1959-1976, and these may not be entirely reflective of the most current trends in free jazz. It would seem worthwhile, then to generalize their ideas with RS theory and test it on more recent examples. However, since the free jazz style can

[270] Steven Block, "Pitch-Class Transformation in Free Jazz." *Music Theory Spectrum* 12.2 (1990), 181-202; Keith Waters, "Introducing Pitch-Class Sets in the Music of Coltrane and Harbison." *GAMUT* 9 (1999), 83–90.

exclude particular musical characteristics, such as clearly articulated phrases or tertian collections, certain heuristics outlined in this dissertation may be need to be revised.[271]

Even considering the contemporary jazz that is treated in this study, there seems to be room for loosening some of the limitations of RS theory. For instance, it was stated at the outset how the theory can accommodate sets of various cardinalities, making it more encompassing than, for instance, chord/scale theory (which includes sets of sizes other than seven, but rarely includes less familiar collections such as the hexatonic scale or a large number of other chromatic pc sets). However, all the RSs in my analyses are diatonic, and this led me to include a heuristic (6) favoring diatonic RSs. This seeming restrictiveness may have two possible sources. First, the specific tunes that I considered may just happen to have characteristics that favor an essentially diatonic hearing. Second, my own approach to playing these tunes is biased towards the diatonic set. In either case, analyzing tunes whose pitch structure prefers non-diatonic collections would undoubtedly strengthen the applicability of RS theory.

A second limitation of the theory results from the depth at which I consider the recorded performances. In each case, I discuss what the improviser is playing without giving consideration to what the accompanists play. Given that improvisation is in many ways a collective activity, one in which ensemble members continuously react to what each other is playing, it is possible that any given transcription could be the result of factors other than what is shown on the lead sheet. However, my analyses always assume that the soloist is playing the transcribed line over the chord notated on the lead sheet, and so preclude the possibility of chord substitutions or reharmonizations. I acknowledge

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[271] Curtis Bahn notes how in free jazz, "the basic texture of 'soloist and accompaniment' gave way to a more diversified, group musical statement. Along with this came a departure from the focus on repetitive tune structures, time, beat, pitch, and functional harmony." Curtis Robert Bahn, "Composition, Improvisation, and Meta-Composition," Ph.D. diss., Princeton University (1998), 42.

this potential limitation, but in no case do I feel that there is such a conflict between what the improviser is playing and the notated chord. Therefore, my intention was simply to show what an improviser *could* play over a given succession of chords. This is not unlike strictly pedagogical sources, which often include numerous excerpts from recorded improvisations to show what the masters played over a given succession. Therefore, as a first stage of research, the current project treated the lead sheet changes as definitive, and compared the improvised melodies against those changes.[272]

Despite limitations such as these, the analyses presented in this dissertation reveal the fact that RS theory has the potential to provide analyses that successfully encompass both "musician-based" and "analytical" results concurrently. The eclecticism of the theory is reflected in the tunes being considered, which amalgamate components of earlier jazz styles, though most notably post-bop, modal, and free jazz. This amalgamation is described by Henry Martin and Keith Waters:

> [M]usical styles launched in the course of jazz history almost never disappear. As a result, the history of jazz should be seen not as a linear progression from style to style—with each new style displacing the previous one—but as a profusion, with styles added as younger musicians tinker with, build on, or modify the work of more-established artists. Jazz history is a rich overlapping of improvisational approaches—a general succession from artist to artist, not from style to style.[273]

Similarly, RS theory draws upon earlier theories, and the enriching work of other theorists, in an attempt to accommodate this diversity of compositional styles.

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[272] In support of this approach, I asked Adam Rogers whether or not the changes on "Labyrinth" were those that the ensemble members used when improvising on the recording? His response was: "if there are changes written on the chart, [then] that's what we're playing." Personal communication, Nov. 5, 2009.

[273] Henry Martin and Keith Waters, *Jazz: The First 100 Years*, 2nd Edition (Belmont, California: Thomson Shirmer, 2006), 345.

From these closing reflections, I can clearly recognize the multiple benefits that the current project has brought me. Satisfying my aims as a theorist and researcher, I conducted thorough and distinctive analyses of select jazz compositions that are representative of some current trends; I hope that they will help to expand the jazz canon within scholarly circles. Satisfying my goals as a performer, my research advanced my own abilities as a musician, and also advocates a listening strategy that other musicians could benefit from. Addressing my pedagogical ambitions, the research provides a resource for younger musicians by contextualizing a variety of non-traditional musical situations within a coherent theoretical framework. And so, in answer to the question posed in at the opening of this chapter, I can answer in the affirmative, and look forward to expanding the scope and application of these ideas.

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