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The Gail Boyd de Stwolinski Center
for Music Theory Pedagogy
James H. Faulconer, Director

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Volume 15

The Gail Boyd de Stwolinski Prize for Lifetime Achievement in Music Theory Pedagogy and Scholarship

Early in 2000, the Gail Boyd de Stwolinski Center for Music Theory Pedagogy secured funding for a unique honor. Louis de Stwolinski permanently endowed a $10,000 biennial prize in his late wife's name. The Gail Boyd de Stwolinski Prize for Lifetime Achievement in Music Theory Pedagogy and Scholarship is to be awarded through a selection process involving nominations from leaders in the field of music theory pedagogy. The winner is chosen by a revolving panel of distinguished music theory pedagogues who make a recommendation to the de Stwolinski Center Board of Directors.

Announcement of the first biennial de Stwolinski Prize was made on November 4, 2000, at the annual business meeting of the College Music Society in Toronto, Canada. The following is excerpted from the text of that announcement.

> The Gail Boyd de Stwolinski Center for Music Theory Pedagogy has a special announcement to make. The de Stwolinski Center was established in 1985 to provide a clearing house for the collection and dissemination of information concerning the teaching and learning of music theory.
>
> Many of you will be more familiar with the de Stwolinski Center through our publication, the *Journal of Music Theory Pedagogy*. Launched in 1987, JMTP has earned an international reputation for quality articles in music theory pedagogy and maintains an impressive subscription list including most major libraries of the world as well as a substantial list of distinguished individual subscribers. Our current editor is Dr. J. Kent Williams of the University of North Carolina at Greensboro.
>
> Today is one of the de Stwolinski Center's happiest days. It was one of Gail's fondest dreams to elevate the role of the classroom music theory teacher - the person who devotes a career to the many times unsung role somewhere between guru and drill sergeant.
>
> Pursuant to Gail's wishes, today we announce the first recipient of the Gail Boyd de Stwolinski Prize for Lifetime Achievement in Music Theory Pedagogy and Scholarship. The de Stwolinski Prize, in the amount of $10,000, is permanently endowed by Louis de Stwolinski, Gail's husband of 45 years. The prize will be awarded biennially starting today to an outstanding music theory pedagogue, someone who has devoted a lifetime to music theory instruction and scholarship.

The text of the award reads as follows:

Whereas the College Music Society has always been a welcoming place for the discipline of music theory pedagogy, and

Whereas the officers of the College Music Society have been encouraging to their -colleagues who promote excellence in college theory teaching and pedagogical research, and

Whereas this international meeting is an appropriate venue at which to announce a significant new award, and

Whereas the Board of Directors of the Gail Boyd de Stwolinski Center for Music -Theory Pedagogy have approved a biennial award of Ten Thousand Dollars to be presented to a college music theory teacher who has been exemplary in classroom teaching, pedagogical research, and mentoring of colleagues in this -field,

Be it therefore resolved on this fourth day of November in the year 2000 that the first Gail Boyd de Stwolinski Prize for Lifetime Achievement in Music Theory Teaching and Scholarship be awarded to

JOHN BUCCHERI

Compassionate teacher, trustworthy scholar, and encouraging mentor.

Buccheri, Northwestern University music theory professor, served the College Music Society for many years as a Board member, treasurer, and most recently, President-elect. His two-year term as President of the Society begins in January 2001. He is a well-known and widely respected teacherscholar in the field of music theory pedagogy.

A graduate of Eastman School of Music where he was awarded his doctoral degree, Buccheri received the Northwestern School of Music's Exemplar in Teaching -Award as well as the Northwestern Alumni Excellence in Teaching Award. He has been a noted presenter both at College Music Society national meetings and at theory
workshops sponsored by CMS, particularly in the areas of rhythm, mental rehearsal, and the analytical reading of scores. Buccheri is currently serving a second term on the Editorial Review Board of the *Journal of Music Theory Pedagogy*. He was a featured presenter at the aural theory pedagogy workshops, "Sparking Aural Imagination: A Hands-on, Ears-on Workshop in Music Theory Pedagogy", co-sponsored by the College of Music Society and the de Stwolinski Center in June 1998 and again in June 2000.

We wish to congratulate Dr. Buccheri as the first winner of the de Stwolinski Prize and look forward to the announcement of many distinguished winners in the future.

No Simple Pieces: Curricular Coherence, Classroom Vocalization, Row Combination, and the "Trio" from Schoenberg's *Suite for Piano*, Opus 25

Mark Sallmen

During his essay "Composition with Twelve Tones" (1941), Schoenberg points to the compositional skill required to manage the relationship between the Trio's canonic voices:

> "The Trio of this Menuet is a canon in which the difference between the long and short notes helps to avoid octaves. The possibility of such canons and imitations, and even fugues and fugatos, has been overestimated by analysts of this style. Of course, for a beginner it might be as difficult to avoid octave doubling here as it is difficult for poor composers to avoid parallel octaves in the 'tonal' style. But while a tonal composer still has to lead his parts into consonances or catalogued dissonances, a composer with twelve independent tones apparently possesses the kind of freedom which many would characterize by saying 'everything is allowed.' 'Everything' has always been allowed to two kinds of artists: to masters on the one hand, and to ignoramuses on the other."[1]

There is more disdain than detail in Schoenberg's commentary; about compositional practice, he writes only of "avoiding octaves." As shown later in this paper and as one might suspect from a composer of Schoenberg 's experience and ability, other more sophisticated methods of contrapuntal organization saturate the "Trio." Although undergraduate theory curricula often leave only a short time for twelve-tone study, it is imperative that we teach students to appreciate such row combination relationships. For if students learn noth-

[1]Arnold Schoenberg, "Composition with Twelve Tones," *Style and Idea*, ed. Leonard Stein, trans. Leo Black (London: Faber and Faber, 1975): 235.

ing of Schoenberg's "mastery" from our teaching, they are unlikely to respect the twelve-tone repertoire. After all, *anyone* could write a canon if the harmony didn't matter! With the pedagogical goal of equipping undergraduate students to uncover or at least understand and appreciate such relations, the paper presents an analytic framework with accompanying vignettes, analyzes the "Trio," and offers musically convincing ways to present these analytic findings in a classroom setting.

Curricular Coherence

In his book *Teaching Approaches in Music Theory*, Michael Rogers underlines the importance of curricular continuity in the pedagogy of twentieth-century music:

> "The main point is that some approach be chosen—that a rationale exists—so that a course does not ramble from topic to topic and issue to issue but is bound together by a predetermined view or governing philosophy that provides some bearings—and that students perceive what that philosophy is."[2]

The following set of issues organizes the analysis of twelve-tone serial compositions and sets the stage for a coherent pedagogical approach to that repertoire. Pitch-class (pc) relationships within such works can be divided into three categories. *Intra-row relations* feature two or more subsets of a single row form, and they permeate an entire piece because they exist within *each* row form. *Inter-row relations* compare one row form with another. The most common type is pitch-class *invariance*, in which a subset of one row form appears untransposed in another. Finally, in *row combination*, a subset may draw pcs from two or more row forms. Example 1 provides sample situations from each of these three categories. Examples 1(a) and (b) depict intra- and inter-row relations, respectively. Example 1(c) depicts two row combination situations. The first relates two subsets, *each* involving pcs from both row forms, and the second relates a bi-row subset to a subset of row P.

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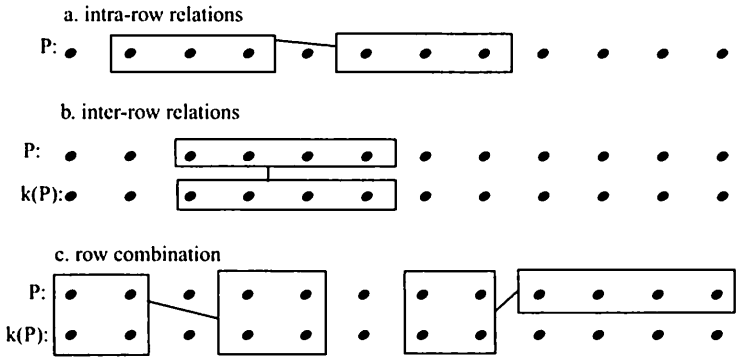
[2]Michael Rogers, *Teaching Approaches in Music Theory: An Overview of Pedagogical Philosophies* (Carbondale and Edwardsville: Southern Illinois University Press, 1984): 73.

Example 1: Categories of relationships in twelve-tone works.



Within these broad categories tremendous variety is possible. The subsets involved in these relations may be composed of temporally-adjacent pcs, as in Example 1's situations, or non-adjacent pcs. Subsets may be of any size and number, and may overlap with one another or be disjoint. Analyses of pc structure typically relate subsets via operations such as transposition-by-n (T_n), inversion (I), and occasionally the cycle-of-fifths transformation. While *set-type* relationships do not preserve pc ordering, *segment-type* relations do and therefore may also invoke retrograde (R) and/or rotation-by-n (r_n). Although temporal ordering is the cornerstone of analytic technique, we may also consider *pitch-space ordering*, the ordering of pcs from low to high. Further, all of these types of relations operate on various *levels*, governing both small and large-scale structure. Moreover, we can study how other dimensions of the *musical realization*—dynamic, duration, contour, meter, articulation, texture, etc.—

help to clarify or conceal various pc relationships.[3] Finally, while analyses usually focus on relationships within a given movement, they may also address relationships with other movements, pieces, and repertoires. Because of the numerous possible combinations of all of the above, relationships are various shades and combinations of simple/complex, sparse/comprehensive, and clear/subtle.

Example 2 relates these many analytic possibilities to the undergraduate curriculum.[4] "Guidelines for Twelve-Tone Analysis" helps students to organize each twelve-tone analysis into three principal categories (intra-row, inter-row, and row combination relations), and encourages them to draw on many facets of their musical expertise. "Analytic Resources" gives a sense of the breadth of knowledge and skill that students may invoke when they have already studied tonal, extended tonal, and atonal music. Though not all-inclusive, this framework fits my current teaching situation (eight classroom hours devoted to the study of twelve-tone music), in which students find a summary that fits on the front and back of a single sheet of paper to be quite helpful. Much of this framework is standard and/or self-explanatory but it is worthwhile to highlight five issues. First, the analytic resources that students first learned while studying tonal

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[3]For treatments of the role of segmentation in analysis see James Tenney and Larry Polansky, "Temporal Gestalt Perception in Music: A Metric Space Model," *Journal of Music Theory* 24 (1980):205-41; Christopher Hasty, "Segmentation and Process in Post-Tonal Music," *Music Theory Spectrum* 3 (1981):54-73; and Dora Hanninen, "A Theory of Segmental Association with Analytic Applications to Four Array-Based Compositions," Ph.D. dissertation, University of Rochester, 1996.

[4]The available textbooks address twelve-tone theory in varying degrees of depth. For texts that focus primarily on atonal music consult Joel Lester, *Analytic Approaches to Twentieth-Century Music* (New York: Norton, 1989) and Joseph N. Straus, *Introduction to Post-Tonal Music* (Englewood Cliffs: Prentice Hall, 1990). For texts that treat a broader range of twentieth-century musical topics and which therefore have briefer twelve-tone sections, see Stefan Kostka, *Materials and Techniques of Twentieth-Century Music* (Englewood Cliffs: Prentice-Hall, 1990) and J. Kent Williams, *Theories and Analyses of Twentieth-Century Music* (New York: Harcourt Brace College Publishers, 1997). For advanced pedagogical situations consider the comprehensive exposition offered by Robert Morris, *Class Notes for Atonal Music Theory* (Hanover, N.H.: Frog Peak Music, 1991) and *Class Notes for Advanced Atonal Music Theory* (Lebanon, N.H.: Frog Peak Music, 2001).

Example 2: Analytic framework.

GUIDELINES FOR TWELVE-TONE ANALYSIS:

A. PRELIMINARIES. (1) Find a row, construct a matrix, and label all row forms. Remember that each row may be found in a single voice, instrument, or register, or may be a collaborative effort involving multiple voices, instruments, or registers. Remember that rows may be re-ordered and several rows may unfold simultaneously. (2) Study the circumstances surrounding the composition of the work (place in *oeuvre*, biographical facts, composer's comments about the piece). Address these issues in your paper *only* if they relate directly to your thesis.

B. INTRA-ROW RELATIONS. (1) Study set-/segment-type repetition and musical realization in the first (linear) row statement. Prepare a musical example that identifies this repetition and write accompanying prose that addresses the relationship between pc structure and musical realization. (2) Each linear row statement will generate the same set-/segment-types—so don't re-calculate them all. But if a row realization radically re-orders the row's pcs you will need to do more calculation and searching to determine what set-types organize the passage and if these are the same or different as those that organize linear row statements.

C. INTER-ROW RELATIONS. (1) Search for pc invariance (T_0 relations) involving ordered or unordered sets of temporally-adjacent pcs, and ordered sets of non-adjacent pcs. Compare each row form used in the piece to each other one. Consider if/how aspects of the musical realization make the invariance easier to hear. Draw some conclusions, construct musical examples, and write accompanying prose. (2) Compare and contrast row realizations. What are the implications for the form of the piece? Summarize your findings in an example with accompanying prose. (3) If the entire row articulates RI or R-invariant pc-interval series, discuss the implications for the number of distinct row forms.

D. ROW COMBINATION. (1) Where rows are superimposed check for combinatoriality. Whether or not there is combinatoriality, search for set-/segment-type repetition and consider how aspects of the musical realization clarify/conceal these. This is a lot of work. (2) Construct a form diagram that identifies the row forms and their relationships. Study transpositional relations. Do these global relations replicate local ones?

E. ANALYTIC RESOURCES. Use all of the analytic techniques, intuition, and musicality developed during your study of tonal, extended tonal, and atonal music.

ANALYTIC RESOURCES:

A. GENERAL. Sing, play, and listen to get you started thinking about the music.

(continued...)

Example 2: (continued...)

TONAL MUSIC

B. HARMONY AND VOICE-LEADING. Intervals, key, scale-degree, triads/seventh chords, passing/neighbor, non-chord tones, modulation, harmonic rhythm, tonal closure, levels, parallel/contrary/similar motion, conjunct/disjunct motion, etc.

C. MOTIVIC TRANSFORMATION. Real/tonal transposition/inversion, intervallic contraction/expansion, octave transfer, retrograde, other order changes, interpolation, ornamentation, exact/inexact rhythmic augmentation/diminution, changes in dynamic/articulation, metric displacement, sequence, fragmentation, canon, stretto, large-scale replication, etc.

D. FORM. Phrase, period, binary, ternary, rondo, sonata, invention, fugue, passacaglia, theme and variations, elision, (re-)transition, episode, etc.

E. TEXT-MUSIC RELATIONS. Repeated words, phrases, vowel/consonant sounds, rhyme/metrical schemes, parallel sentence structure, analogy, etc.

EXTENDED TONAL MUSIC

F. EXTENDED TONAL TECHNIQUES. Diatonic/altered ninths, elevenths, and thirteenths, modes, diatonic, octatonic, whole-tone, pentatonic, symmetry, golden mean, etc.

ATONAL MUSIC

G. SET-TYPE ANALYSIS. (1) Labels: Plot the pcset on the pitch-class clock. Find a starting pc and direction that yields one of the set types (prime forms) on Forte's list. The label provides the set type, the direction (↑ for clockwise, ↓ for counterclockwise), and the starting pc. For example, the label for {B♭BD} is $[014]_{\uparrow B\flat}$ because counting clockwise from B♭ yields prime form [014]—that is, B♭-B-C-D♭-D yields zero-one-(two-three)-four. (2) Process: Calculate the set-type for each "vertical slice" of the musical texture and for the union of adjacent vertical slices (tri-, tetra-, penta-, hexa-chords). In monophonic situations these are called the imbricated sets. This method may generate a large number of set-types but do not be alarmed. Include only a few of these—often the ones that appear multiple times—in your final interpretation. Aspects of the musical realization may also suggest that you consider set-types involving pcs that are not temporally adjacent. (3) Relating sets: Set-type identity, subset/superset relations, z-relation, similarity, circle-of-fifths, etc..

H. SEGMENT-TYPE ANALYSIS. (1) Labels: A capital letter enclosed in parentheses denotes a set of $R/T_n/I$-related segments (a segment-class) and P, I, RP, or RI specifies the orientation (prime, inversion, retrograde-prime, retrograde-inversion). For P and I forms the subscript indicates the initial pc and for RP and RI forms the final one. For example, $P(X)_D$ = D-C♯-A and $RI(X)_G$ = C-A♭-G are related by RT_9I. When the segment-class is the set of $R/T_n/I$-related twelve-tone rows for a given piece, the capital letter enclosed in parentheses is customarily omitted (RI_B, $P_{B\flat}$, etc.) If segments are related by R/T_n (and not I), P and I indications are likewise unnecessary

(continued...)

Example 2: (continued...)

($X_{E\flat}$, X_G, RX_E, etc.). (2) Process: Calculate the pc intervals between adjacent pcs. Search for patterns. Add together adjacent pc intervals to find patterns involving non-adjacent pcs. In polyphonic situations search for segment-type repetition both within and between voices. (3) Cycles: A series of pc intervals with a repeating pattern such as < 949494> or <5555>.

I. PITCH-SPACE ORDERING. Study pcs ordered in pitch space (from low to high) in the same ways we study pcs ordered in time (from early to late).

J. LEVELS. Take your analysis to a higher level by studying the subscripts of the labels of $(R)T_n$-related sets and segments in the ways we study individual pcs.

K. MUSICAL REALIZATION. Overall, what musical factors can help us to hear various pc relations? (1) Do pattern repetitions in other dimensions correspond with pc relations? Check for repeated series of pitch intervals, durations, dynamics, articulations, textures, and/or timbres. Sometimes patterns are repeated precisely and sometimes they recur transformed. Some transformations are precise (pitch transformations R, T_n, I; exact rhythmic augmentation/diminution; etc.) but others are imprecise and so involve omission, addition, re-ordering, and/or the *ad hoc* expansion or contraction of pitch intervals, durations, dynamic ranges, etc. (2) Does adjacency support the pc relations? It is straightforward to hear connections between temporally-adjacent pcs, but other dimensions also suggest grouping. For example, pitches are easy to connect if they are in the same register (registral adjacency), played by the same instrument (timbral adjacency), etc.. (3) Do salient musical features clarify pc relations? Examples of salient events: first/last, highest/lowest, loudest, longest, one *staccato* in the midst of *legato* phrasing, trumpet notes in a sea of percussion, etc.. (4) Do subset boundaries suggested by large intervals/changes in various dimensions correspond with those suggested by pc relations? The following suggest subset boundaries: a duration longer than the preceding and following durations, a pitch interval larger than the preceding and following pitch intervals, a sudden dynamic change, a change in instrument, a change from *marcato* to *dolce*, etc..

L. TWO-STEP SEARCH PROCESS. Step 1: Lengthen the pattern. Step 2: Search for copies of the pattern. Repeat these steps until the copy no longer copies the pattern. Bracket these sets. Repeat the process until the passage is completed. Use the process to search for pc identity (pc invariance in twelve-tone contexts), set-/segment-type repetition, and patterns in other dimensions (rhythm, articulation, etc.). (The paper steps through the process three times: Example 3(c) and footnotes 12 and 14.)

and extended tonal music (Analytic Resources A-F on Example 2) help to identify relationships within a given twelve-tone work, and to illuminate connections to earlier pieces and repertoires. Moreover, by comparing and contrasting set- and segment-type analysis with their tonal counterparts (the scanning of melodies and entire musical textures for harmonic/motivic patterns) we learn more about both sets of analytic skills. Second, atonal labels such as $[014]_{\uparrow B\flat}$ and $[014]_{\uparrow C}$, which identify {B♭BD} and {CD♭E} respectively, facilitate the study of T_n relations. In this example ↑B♭-↑C suggests T_2. Such analysis imitates tonal situations where root motion is easily inferred from chordal roots, as in the descending-fifths progression of minor-seventh chords Cm^7-Fm^7-$B\flat m^7$-$E\flat m^7$. (Consult Analytic Resources G1 and J.) Third, I introduce students to ordered sets and their labeling at the beginning of the study of atonal music (Analytic Resource H); this enriches our study of the atonal repertoire, lessens the strain on the introduction to twelve-tone analysis, and creates continuity between the atonal and twelve-tone repertoires. Further, when students are coached to address musical realization (Analytic Resource K), they have a more balanced analytic experience, a mixture of pc calculation and other types of musical insights. As a result, students relate analysis to listening and improve their analytic prose—fewer recitations of pc statistics and empty surface descriptions, instead, the beginnings of sophisticated interpretations. Finally, the framework provides a search process—essentially organized trial and error— that helps some students to uncover repeated patterns that others hear/find instinctively (Analytic Resource L). Overall, the framework provides context, possibly even reducing the need for hints and leading questions throughout the course to help students deal with specific cases. This equips students to confront with confidence unfamiliar situations even after the course is over. With such a framework to guide them, students are more likely to emerge with a deeper and clearer understanding, not only of associations within and between twelve-tone pieces, but also of the repertoire's relationship to its historical precedents. As a result, twelve-tone study becomes part of a unified undergraduate theory curriculum.

We now witness the framework in action, first in a series of analytic vignettes appropriate for an introduction to twelve-tone analysis, and then in an analysis of a complete movement, Schoenberg's

"Trio." This pedagogical strategy aspires to the curricular consistency that all of us find routine in tonal contexts, where students examine repertoire excerpts and instructor-made examples as they learn a set of analytic tools (harmonic, motivic, rhythmic, formal) with which they can approach any (complete) tonal piece.

Analytic Vignettes

The following discussion treats ordered and unordered pc relations within each of the guidelines' primary categories (intra-row, inter-row, and row combination relations), addressing various other analytic resources on an *ad hoc* basis. At times, the narrative makes explicit the connection between vignette and framework, while at other times the connection is implicit and therefore must be inferred by the reader. Likewise, there are occasional suggestions for classroom vocalization activities, which can be extended and adapted to suit other vignettes and a variety of pedagogical situations.

Example 3 points out three *intra-row relations*. Example 3(a) depicts row saturation with set-type [015].[5] Registral adjacency highlights the four discrete subsets: the lowest three pcs in the passage constitute $[015]_{\downarrow B}$, the next three lowest pcs $[015]_{\uparrow C}$, etc.. These four subsets articulate a large scale T_2 relationship. Since $[015]_{\uparrow E}$ and $[015]_{\downarrow A}$ share the same attack-point rhythm, metric placement, and melodic and dynamic contour it is easy to hear the latter in terms of the former—specifically, $[015]_{\downarrow A\flat}$ is a registrally-expanded, louder version of $[015]_{\uparrow E}$.[6] Long durations also support the segmentation, separating $[015]_{\uparrow E}$ and $[015]_{\downarrow A\flat}$ from one another and $[015]_{\downarrow A\flat}$ from the final *staccato* material. Example 3(b) points out an RI-invariant pc-interval series, which is highlighted by palindromic features of the

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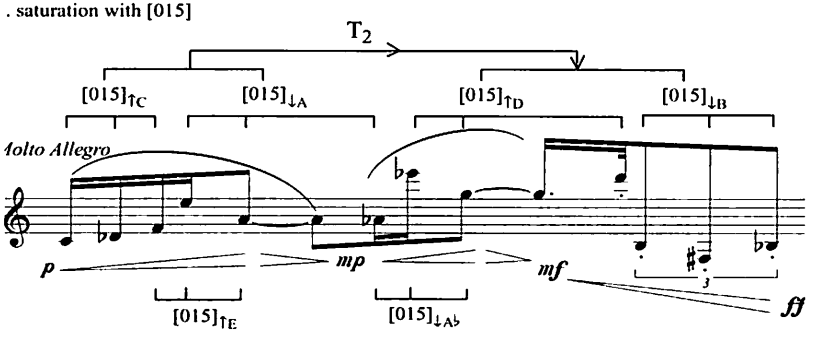
[5]For a detailed discussion of the topic see Robert D. Morris, "Set-Type Saturation Among Twelve-Tone Rows," *Perspectives of New Music* 22/1-2 (1983-84):187-217.

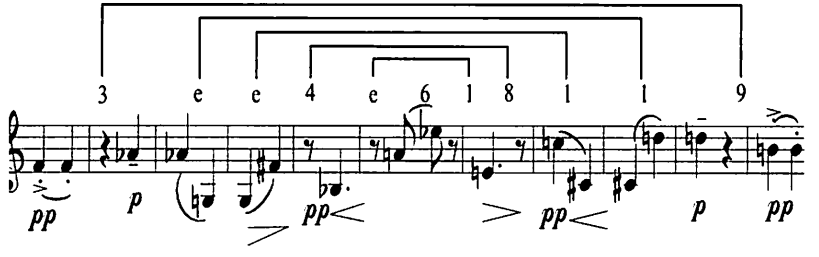
[6]An *attack-point rhythm* is an ordered series of durations measured from the attack of one note to the attack of the next. In this case $[015]_{\uparrow E}$ and $[015]_{\downarrow A\flat}$ each articulate sixteenth attack-point rhythms. Registral (a.k.a. intervallic) expansion/contraction is treated in William Christ et al, *Involvement with Music* (New York: Harper's College Press, 1975): 52-53; and in Williams, *Theories and Analyses*: 152.

Example 3. Intra-row relations.

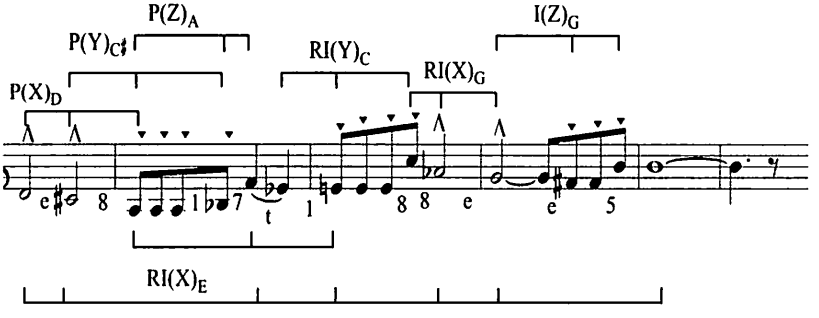
. saturation with [015]



Anton Webern, *Symphonie*, Op. 21, II, Theme, mm. 1-11, clarinet. Webern, *Symphonie*, Op. 21, 1929 Universal Edition. Copyright renewed. All Rights Reserved. Used by permission of European American Music Distributors LLC, sole US and Canadian agent for Universal Edition.



Schoenberg, *String Quartet No. 4*, Op. 37, vln. I, mm. 1-6. *String Quartet No. 4*, Op. 37, by Arnold Schoenberg. Copyright © 1939 (Renewed) by G. Schirmer, Inc. (ASCAP). International Copyright Secured. All Rights Reserved. Reprinted by permission.



<e4> cycle

musical realization (durations, dynamics, pitch intervals). Example 3(c) depicts row saturation involving three three-pc segment-types (X, Y and Z); that is, $P(X)_D$ - $P(Y)_{C\#}$ - $P(Z)_A$ at the beginning of the row and $RI(Y)_C$ - $RI(X)_G$ - $I(Z)_G$ at the end. The grouping of these six segments into two trios is suggested, not only by the appearance of X, Y, and Z in each, but also by subset overlap. Adjacent subsets overlap by two pcs within the first trio, by one pc within the second trio, and by *zero* pcs between trios. Overall, this creates a tidy though asymmetrical division of the row into five- and seven-pc units. The setting of $P(X)_D$ and $RI(X)_G$ with R-related series of durations, articulations, and pitch intervals strongly supports their pc relationship, but the realizations of the Y and Z subsets do not correspond to the same degree. The example also points out $RI(X)_E$ and an <e4> cycle that embeds five more Y subsets ($RP(Y)_F$ = D-C♯-F, $I(Y)_{C\#}$ = C♯-F-E, etc.). Although non-adjacent pcs are involved, the relationships are reasonably easy to follow because of their consistent and salient metric placement—all pcs are articulated "on" the half-note beat. Moreover, the <e4> cycle makes steady use of pitch intervals –1 and +4.[7]

Even in these few interpretations we have already invoked many of the framework's atonal analytic resources. Students can come to these and other such interpretations by studying the sets and pc intervals involving adjacent pcs (Analytic Resources G2 and H2), perhaps with the help of the two-step search process (Analytic Resource L).[8] In searching the pc intervals in Example 3(c) for instance, start with the first interval, e (Step 1), and search for copies, that is

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[7]For texts that also address Webern's *Symphony*, Op. 21, see John Rahn, *Basic Atonal Theory* (New York: Schirmer, 1980): 4-18; and Lester, *Analytic Approaches*: 80. For Schoenberg's *String Quartet No. 4*, see Lester, *Analytic Approaches*: 37-39, 68, 79, 176, 192-3, 209-14; Straus, *Introduction*: 30, 35, 119-23, 127-130, 148-150, 156-160; and Williams, *Theories and Analyses*: 276-280, 292.

[8]The ordered set of pc intervals formed by adjacent pcs in the row is called INT_1 in Robert Morris, *Composition with Pitch-Classes: A Theory of Compositional Design* (New Haven: Yale University Press, 1987): 40. The list of a row's imbricated n-sized set-types is defined as BIP_n in Morris, *Notes*: 112. BIP_n generalizes BIP, a tally of interval classes formed by adjacent pcs in a row, set forth by Allen Forte, "The Basic Interval Patterns," *Journal of Music Theory* 17/2 (1973): 234-272. The study of a row's imbricated set-types is also recommended in Kostka, *Materials*: 212-215.

e's or 1's (Step 2). Having found 1 and e later in the row, extend the pattern to <e8> (Step 1), and search for <e8>, <8e>, <14>, or <41> (Step 2). Having found <8e>, extend the pattern to <e81> (Step 1) and search for <18e> (Step 2). Since it is not present, bracket and label the segments that articulate <e8> and <8e> and restart the process, beginning this time with the second pc interval of the row.[9] Continue in like fashion until the entire row has been studied.

I also encourage students to sum adjacent pc intervals (mod 12), looking especially for replications of surface patterns, so that they uncover "hidden" references such as $RI(X)_E$ and the <e4> cycle (Analytic Resource H3). For example, within pc-interval series <e817t1>, 1+7 = 8 and t+1 = e, the resulting <8e> reverses the initial <e8> pointing to the relation between $P(X)_D$ and $RI(X)_E$. With the ability to consider non-adjacent pcs a routine part of row analysis, more students may notice—*without prompting*—relationships such as the embedded <5> and <7> cycles in the row of Berg's "Schliesse mir die Augen Beide." Overall, with such analytic skills students can understand and explain the types of rows usually included in twelve-tone surveys (set-type saturated, derived, all-interval, RT_6-, and RT_nI-invariant rows), as well as others with less obvious and celebrated patterns.

These interpretations have also addressed musical realization as outlined in Analytic Resource K. *Repeated patterns* in various dimensions help to clarify pc relations (rhythm and contour in Example 3(a); rhythm, pitch intervals, and articulation in 3(b); and rhythm and articulation in 3(c)). Registral *adjacency* and *large temporal intervals* (durations) support segmentations in 3(a), and metric *salience* helps us to follow the cycle in 3(c).

Students sing to provide aural reinforcement of theoretical relationships throughout their study of tonal music and should continue to do so throughout the post-tonal curriculum. Example 4 scripts a

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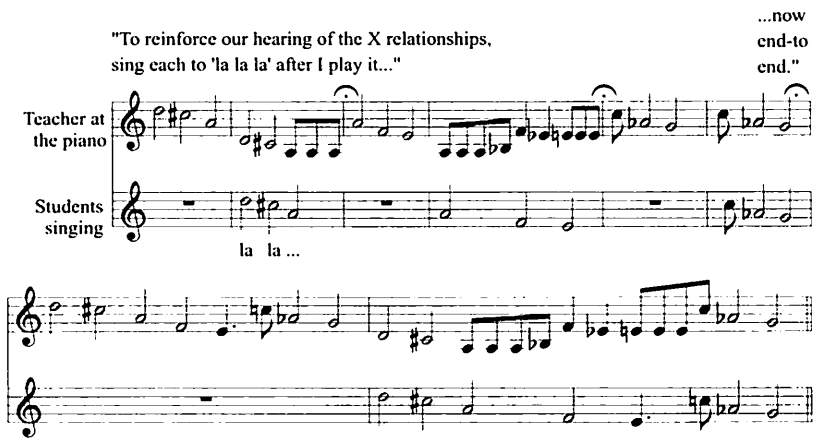
[9]Students readily comprehend that identical pc-interval successions characterize T_n-related pc segments and that I-related interval successions identify T_nI-related pc segments; but they are often initially confused to hear that RI- and R-related interval successions signal RT_n- and RT_nI-related segments, respectively. For example, R-related interval successions <e8> and <8e> signal RT_nI-related segments $P(X)_D$ and $RI(X)_G$. Such confusion must be completely eliminated before a student can succeed.

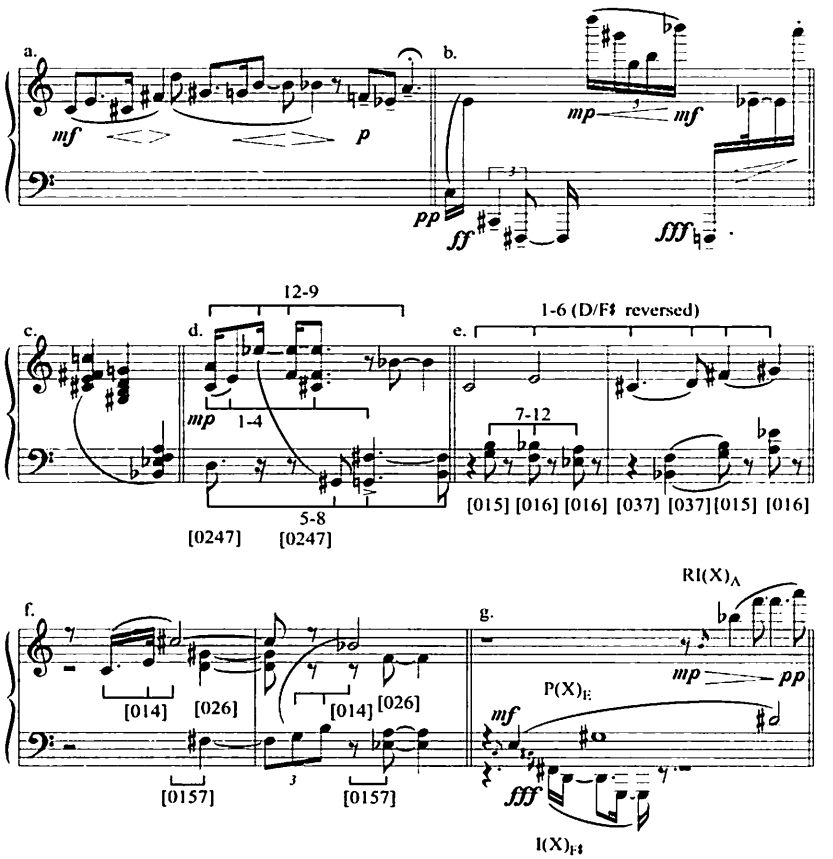
Example 4. Classroom activity based on part of Example 3(c).



brief classroom activity that reinforces the X relationships of Example 3(c). The activity might go on to treat the Y, Z, and cyclic relationships in like fashion and then culminate with students singing the entire melody, at first in *unison* with the piano, then *a cappella*, and finally accompanied by the violin II, viola, and cello parts played by the instructor at the piano. The simplicity of such activities makes them useful with students of any skill level, provides welcome comfort for students who fear twelve-tone music/theory, and allows students to focus on the analytic points being reinforced rather than on vocal agility or sight-singing. Such musical involvement also encourages students to respect and enjoy the twelve-tone repertoire. Moreover, the vocal repetition inculcates the sound of the atonal language, a necessary first step to sight-singing atonal music. We should not be surprised that students need such practice since they have usually sung many tonal melodies before learning to *sight*-sing them. On the whole these activities provide great benefit and require very little class time.

So far, rows have been presented in straightforward linear fashion. As Guideline A suggests, this will not always be the case. The study of a wider variety of realizations of a single row can prepare

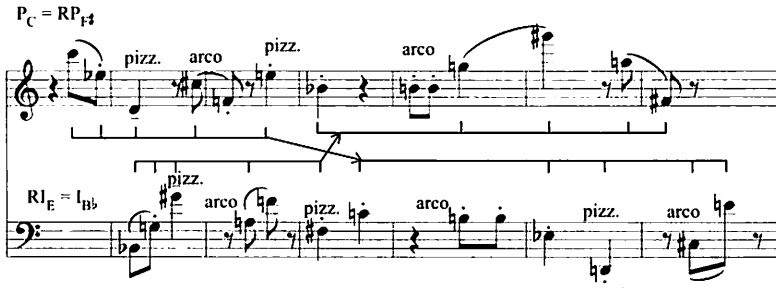
Example 5. Realizations of C-E-C♯-F♯-D-G♯-G-B-B♭-F-E♭-A.



for situations that arise later in the twelve-tone curriculum during the study of complete pieces. In Example 5, parts (a) and (b) are linear presentations with contrasting registral, rhythmic, and dynamic layouts. Parts (c) – (e) mimic the partial orderings of three undergraduate-curriculum favorites by Schoenberg. In (c), the row's three discrete tetrachords are given a chordal presentation akin to the opening of the *Piano Piece*, op. 33a. Part (d) places these tetrachords—one in retrograde—in registral layers as in the *Suite for Piano*, op. 25. In (e) the initial hexachord unfolds in the upper

voice with an order reversal, and the final hexachord in the lower voice's dyads, followed by a re-ordering of the dyads—a somewhat irreverent allusion to the outset of *String Quartet No. 4*, op. 37. Part (f) alternates linear and chordal presentation of the row's discrete trichords, and (g) presents three rhythmically independent voices. The example also points out how non-linear row statements can emphasize various intra-row relations (Guideline B2). Contour and texture in (f) highlight set-type relations involving row-adjacent pcs. The layering and re-ordering in (d) and (e) render simultaneous or adjacent pcs that are *not* adjacent in linear row presentations, therefore providing new possibilities for set-type repetition such as that shown on the example. As suggested by Analytic Resource G2, students can discover such relationships by studying each "vertical slice" of the musical texture and the union of adjacent ones, and then scanning for repetition. Such situations are even easier and quicker to study than linear row statements because fewer sets are involved. For instance, if we study tri-, tetra-, penta-, and hexachords, a linear row statement provides thirty-four sets but Example 5(d) provides only twelve. In part (g), registral layout and the three-voice texture highlight R/T_n/I-related segments $P(X)_E$ = E-G♯-D♯, $I(X)_{F♯}$ = F♯-D-G, and

Example 6. Ordered invariance involving non-adjacent pcs.



$RI(X)_A$ = B♭-F-A. Rhythm also supports the pc relationships. $I(X)_{F\#}$'s durational series is 1-4-2, measured in sixteenth-note units. $P(X)_E$ *quadruples* these durations and $RI(X)_A$ *doubles* them and retrogrades their ordering, so that the durational ratio 1:4:2 inhabits not only each X subset, but the trio of X subsets as a whole. (The passage's grace notes do not participate in these pc/duration relationships.)

We now turn to *inter-row relations*, addressing only the most common type, *pc invariance* (Guideline C1). One type of invariance involves pcsets whose pcs are adjacent in two or more $R/T_n/I$-related rows. In the second of Dallapiccola's *Goethe-Lieder*, $P_{G\#}$ and I_A set four vocal phrases, six pcs to a phrase. Invariant dyads mark phrase beginnings, and invariant tetrachords phrase endings ($P_{G\#}$ = G♯A GFBE / DE♭ B♭D♭CF♯ and I_A = AG♯ B♭CF♯D♭ / E♭D GEFB).[10] Sometimes invariant row fragments retain their ordering, as in the following examples based on Dallapiccola's row. $P_{G\#}$ = G♯ AGF BEDE♭B♭D♭CF♯ and $RI_{F\#}$ = G♯DD♭EBCB♭E♭ AGF F♯ share only one ordered trichord, but $P_{G\#}$ = G♯AG FB EDE♭ B♭D♭ CF♯ and $RI_{E\flat}$ = FB B♭D♭ G♯AG CF♯ EDE♭share *five* ordered fragments. Invariance can also involve ordered sets with non-adjacent pcs, such as C-E♭-D-C♯-E and B♭-G-G♯-A-F♯ in Example 6. Pitch layout partially supports the invariance: pitch-interval series –9 –13 +11 sets each C-E♭-D-C♯ and +9 +13 –11 each B♭-G-G♯-A.[11] At times invariance involves a single pc, although this is usually only significant if emphasized by the musical realization or if the pc remains at a salient order position, such as the beginning or end of a row. Conversely, invariance may involve complete rows, as in Webern's *Symphonie* where each row is identical to the retrograde of its tritone transposition (RT_6–invariance). In such cases each row has two labels, such as $P_C/RP_{F\#}$ and $RI_E/I_{B\flat}$ in Example 6, and the

[10]For the score and a series of leading questions see Mary Wennerstrom, *Anthology of Twentieth-Century Music* (Englewood Cliffs: Prentice-Hall, 1988): 93. $P_{G\#}$ and I_A set the lines of text that address the sun and crescent moon respectively. As Wennerstrom's questions suggest, invariance provides a musical answer to the poem's question about the relationship between the sun and crescent moon: "[How] could such a pair unite?"

[11]These examples/categories correspond to pc association types 2, 1, and 4, respectively, as discussed in Morris, *Advanced Notes*: 158-160.

number of distinct row forms is twenty-four, half of the usual forty-eight (Guideline C3).[12]

The study of *row combination* starts with classical combinatoriality, in which pcsets from different row forms combine to articulate pc aggregates. Aggregates arise through the combination of hexachords from T_nI-related rows in Example 7(a), and in other pieces through the combination of tetrachords, trichords, dyads, or sets of varying sizes. But row combination need not involve aggregate completion. In Example 7(b) two rows in tandem invoke harmonic resources familiar to students of tonal and extended tonal music—diatonic and whole-tone collections whose registral layouts suggest tritone-related pairs of fifth-related dominant-seventh chords, E^7-A^7 and $B\flat^7$-$E\flat^7$. E^7-A^7 features the "whole tone" chordal extensions (9, ♯11, and ♭13), $B\flat^7$ is missing two chordal members, and $E\flat^7$ is enriched by a chordal ninth. Moreover, these collections/chords articulate precise and imprecise inversional symmetry. Each whole-tone collection articulates the series of pitch intervals 10-6-10-6-10, the second being a precise pitch-space transposition (by –7) of the first. The spacings of the diatonic collections are nearly symmetric (11-7-3-7-10 and 7-7-2-6-7). As suggested by Analytic Resource I, students can discover such identical spacings, inversional symmetry, and other pitch-space relations if they consider pc ordering from low to high, studying the intervals between pitch-adjacent pcs in the same way that they explore temporally-adjacent pcs in a linear row presentation. This strategy also helps to explain the pitch layout of the initial measure of Example 7(c). $X_G{}^3 = G^3$-C^4-$E\flat^4$-$G\flat^4$-D^5 is pitch-space transposed by +2 into the immediately following $X_A{}^3 = A^3$-(D^4)-F^4-$G\sharp^4$-E^5. The inexact nature of the match is a result of the twelve-tone context; since pc D appears in $X_G{}^3$ it does not also appear in $X_A{}^3$. The subset/superset

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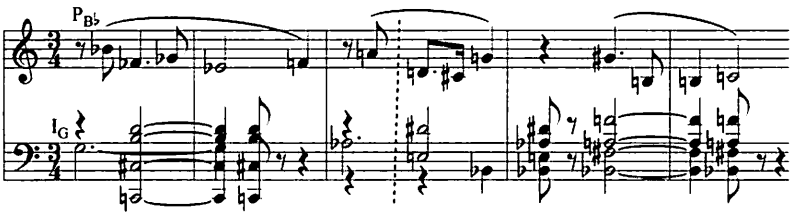
[12]The two-step searching process can be used to identify various types of invariance. In searching $P_{G\sharp}$ and I_A for instance, take the first pc in $P_{G\sharp}$ (Step 1) and search for it in I_A, (Step 2). Extend the pattern to G♯-A (Step 1). Search I_A for copies of G♯-A that maintain adjacency, ordering, or both (Step 2). Having found A-G♯ re-ordered but adjacent in I_A, extend the pattern to G♯-A-G (Step 1) and search I_A for G adjacent to G♯-A. It does not occur so bracket the G♯-A and A-G♯ and restart the process with the next pc, G. Repeat until the row is complete.

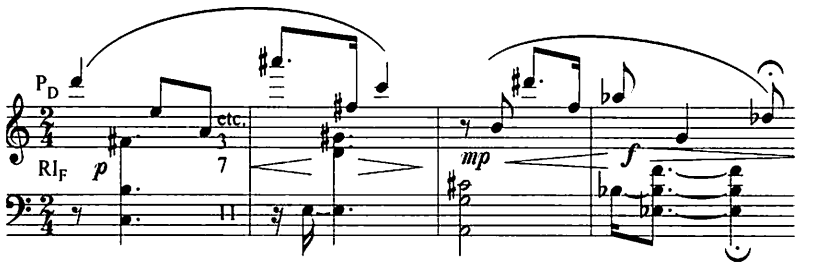
:xample 7. Row combination.

. Schoenberg, *Variations for Orchestra*, "Theme," mm. 1-5. Used by permission of Belmont Music Publishers, Pacific Palisades, CA 90272.



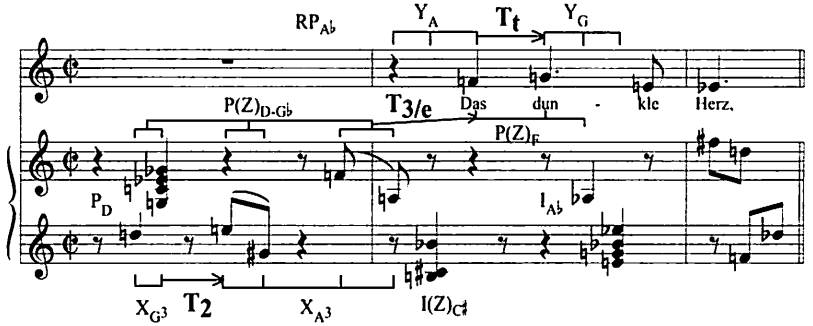
$P_{B\flat}$:	B♭F♭G♭E♭FA	DC♯GG♯BC
I_G:	GC♯BDCA♭	D♯EB♭AF♯F

). Extended tonal references; symmetric and quasi-symmetric spacing.



:ollections:	G diatonic (omit G)	whole tone	whole tone	A♭ diatonic (omit C)
:hords:		E^7 (♯11-9-♭13)	A^7 (9-♯11-♭13)	B♭$^{7?}$ E♭^{7} (9)
pacing:	11-7-3-7-10	10-6-10-6-10	10-6-10-6-10	7-7-2-6-7

c. Anton Webern, *Three Songs*, "Das dunkle Herz," mm. 1-3. *Drei Gesange.* © 1936 Universal Edition. Copyright Renewed. All Rights Reserved. Used by permission of European American Music Distributors LLC, sole US and Canadian agent for Universal Edition.



relationship between X_G^3 and X_A^3 is easily deduced by the addition of adjacent intervals 5 and 3 in X_G^3's 5-3-3-8 to yield X_A^3's 8-3-8.

Example 7(c) also identifies two segment-type pairs that interpret pcs from three row forms ($RP_{A\flat}$, P_D, and $I_{A\flat}$). First, Y_A = A-B♭-F and Y_G = G-A♭-E♭ are T_t-related three-pc segments. Despite their contrasting pitch-space layouts and a shift from piano to voice and back, the Y relationship is very easy to follow. The subsets are adjacent, the recurring eighth-eighth attack-point rhythm and consist metric setting supports the pc correspondence, the lengthier attack-point quarter duration between the subsets supports the segmentation, and when notes are struck simultaneously the interpretation considers the top note of the chord. Overall, the X and Y interpretations are related because they articulate complementary transpositions, T_2 and T_t, respectively. The other interpretation encompasses both measures 1 and 2. $P(Z)_{D\text{-}G\flat}$, the series of descending minor sixths (D^5-$G\flat^4$, E^5-$G\sharp^4$, F^4-A^3), articulates T_{+2} T_{-11}, as does $P(Z)_F$ shortly thereafter. The connection is relatively easy to follow, not only because of the consistent pitch layout and the linking pitch F^4, but also because of the rhythm, which strictly alternates attack-point eighths and quarters from the beginning of $P(Z)_{D\text{-}G\flat}$ to the beginning of $P(Z)_F$. An attack-point eighth sets each minor sixth, supporting the pitch correspondence, and a (longer) attack-point quarter separates each minor sixth from the next, supporting the segmentation. Further, the change in timbre (piano/voice) corresponds precisely with the division between $P(Z)_{D\text{-}G\flat}$ and $P(Z)_F$. The chord that is skipped over in this scheme can be viewed as a verticalization of $I(Z)_{C\sharp} = C\sharp^4\text{-}B^3\text{-}B\flat^4$, which articulates the inverse transformations, T_{-2} T_{+11}.[13]

Ideally students will learn to find such relations independently—and they may do this more easily than we might think—but in preparation for this ultimate goal the instructor may provide more context-specific instructions or simply present such relations to the class.[14] In any case, the order-preserving nature of the relationships

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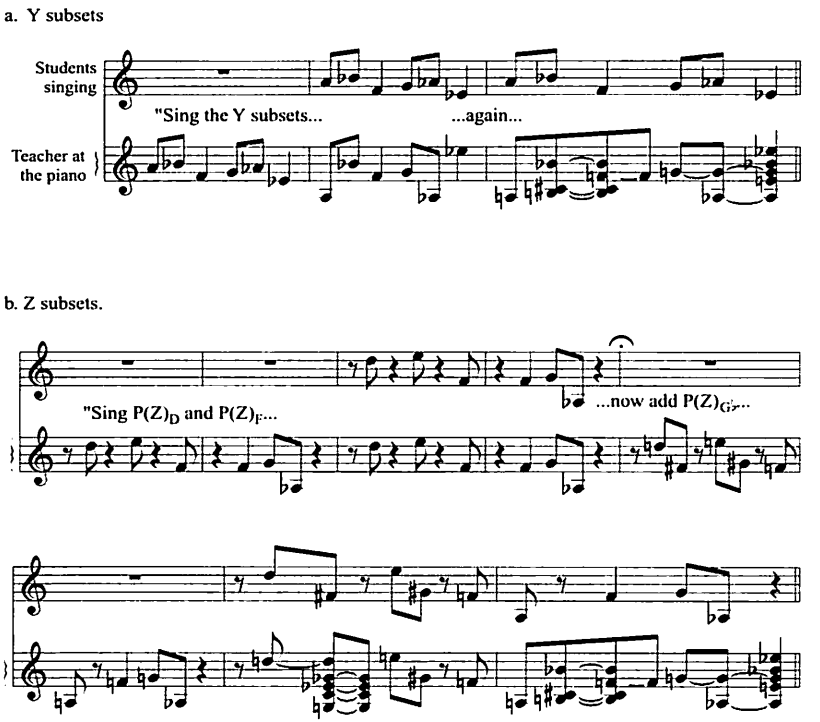
[13]For an analysis of the entire song, see Brian Alegant, "A Model for the Pitch Structure of Webern's Op. 23, No. 1, 'Das dunkle Herz,'" *Music Theory Spectrum* 13/2 (1991): 127-146.

[14]For instance, Example 7(c)'s Y and Z interpretations may be prompted with the following: "For measures 1 and 2 calculate the pc intervals between

Example 8: Sample classroom vocalizations based on Example 7(c).

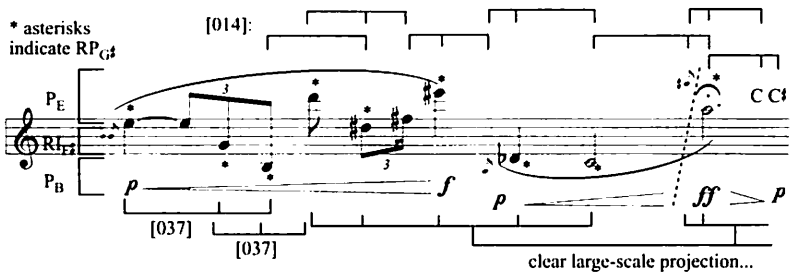


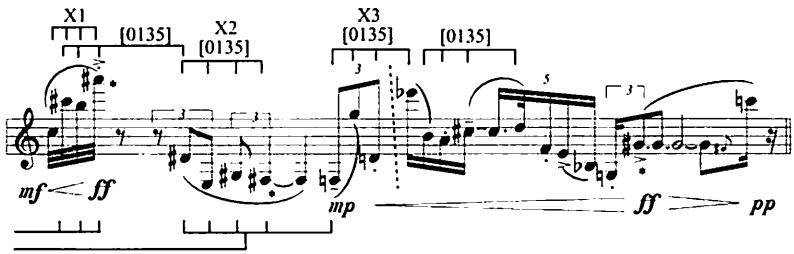
in Example 7(c) makes them ideal candidates for classroom vocalization activities such those in Example 8. When simultaneously-stated row forms are notated on different staves as they are in Example 7(c), row combination subsets involve multiple staves and may even skip from staff to staff several times. Such segmentations may arouse skepticism, but as the foregoing descriptions and vocalization activities demonstrate, such relations are relatively easy to hear and sing—perhaps easier than they are to "see" on the score—and it is the hearing and singing that matters.

Example 9(a) summarizes and extends the foregoing row combination examples by incorporating many strategies into a solo clarinet passage. Registral partitioning reveals $R/T_n/I$-related rows P_E, $RI_{F\#}$,

Example 9: Row combination.

a. Clarinet passage and the array on which it is based.

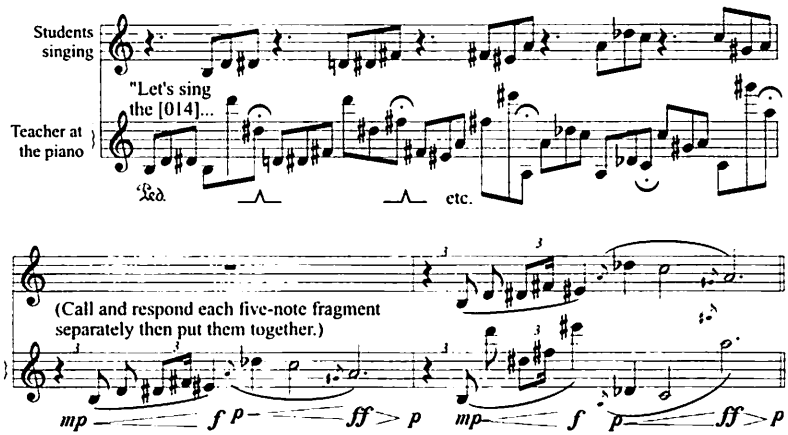




... of [037] via RT_8 - T_7

P_E:	EDF♯E♯G♯	AC♯BA♯G	E♭C
$RI_{F\sharp}$:	B♭GD♯	C	BAC♯DFEGG♯F♯
P_B:	BAD♭C	D♯EG♯F♯FD	B♭G

b. Classroom activity that emphasizes the [014] saturation.



and P_B. These rows are divided into subsets of various sizes to form vertical aggregates (combinatoriality) as demonstrated by the array at the bottom of Example 9(a).[15] The partial orderings defined by this array structure are realized so as to maximize first [014], then [0135], and to articulate an additional row form ($RP_{G\sharp}$ marked by asterisks). At first $RP_{G\sharp}$'s pcs are temporally-adjacent (or nearly so), but later in the passage they are not and so long durations and/or accents emphasize them. A recurring articulation pattern (two notes slurred followed by one *staccato*) and a written-out *accelerando* organize the passage between $RP_{G\sharp}$'s final two pitches ($F\sharp^3$-$G\sharp^4$). Grace-note tritones mark the beginning and end of the passage. X1-X2-X3 articulates a recurring motive of a different sort. X1 and X3 are linked by pitch contour, dynamic contour (*crescendo*), and even-duration attack-point rhythms (thirty-second notes in X1 and triplet eighths in X3). X2 features the triplet eighths of X3, metrically shifted to begin "off" rather than "on" the beat, and an inversion of X1 and X3's

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adjacent pcs, considering only the top notes of piano chords (D^5-$G\flat^4$-E^5-...). What patterns arise? What other dimensions support these pc patterns?" With experience students may independently be able to cope with the polyphonic texture using the two-step search process as follows. Because of the four-note chord following the initial D^5, there are four two-note patterns with which we could begin: D-G♭, D-E♭, D-C, D-G (Step 1). D-G♭ is the most logical choice because $G\flat^4$ is at the top of the chord and registrally closest to D^5. Starting with other pcs would waste a bit of time but would not be fatal to the analysis because those searches would dead-end and they would eventually try D-G♭. Search for $R/T_n/I$-related copies of D-G♭ (Step 2). Having found E♭-G, E-G♯, and F-A, extend the pattern to D-G♭-E♭ (Step 1) and search for copies (Step 2). D-G♭-E♭ and its copies E♭-G-E and E-G♯-F overlap to create D-G♭-E♭-G-E-G♯-F-A, which alternates pc-intervals 4 and 9—a <49> interval cycle. This is a nice interpretation in its own right, but paying attention to pitch-layout leads to the X interpretation. Pitch layout *and* attack-point rhythm suggest relating D-G♭, E-G♯, and F-A—but we need to take the search process to a new level to achieve the Z interpretation. Studying the intervals of transposition between these minor sixths yields <21> (Step 1). The search for segments that articulate <21>, <12>, <te>, or <et> leads to $P(Z)_F$ and $I(Z)_{C\sharp}$ (Step 2), and the study of pitch-space realization to <+2 –11> and <–2 +11>.

[15]Combinatoriality involving subsets of unequal size is discussed in Daniel Starr and Robert Morris, "A General Theory of Combinatoriality and the Aggregate," *Perspectives of New Music* 16/1 (1977-8):3-25; 2:50-84.

contour-interval series (↓-↑-↓ instead of ↑-↓-↑). These relationships are particularly easy to hear, not only because X1-3 are adjacent and non-overlapping, but also because of the rests and long duration that separate them from one another, and the setting of both X2 and X3 with [0135]. Example 9(b) suggests an activity that reinforces the [014] saturation. Such activities can help students to feel some connection to a passage whose frequent and large registral shifts and multi-level pc relations may initially seem daunting.

Each of the preceding row-combination relations involves at least one subset that includes *portions* of two or more row forms. In the following associations at least one subset contains two or more *complete* row forms (Guideline D2). As with other primary categories of relationships, these may be systematic or *ad hoc*, ordered or unordered, etc.. Example 10(a) lists the row labels for the first four blocks of the six-lyne array that forms the basis for Babbitt's *The Joy of More Sextets*, and points out RT_n-related pairs of row pairs. These row-pair pairs group into pairs on yet another level because of the repetitions of RT_0, RT_6, and RT_9. At the top of the array the RT_n-relations involve adjacent columns and the same lyne, at the bottom adjacent lynes and the same column, and in the middle adjacent lynes and adjacent columns.[16] Not all works employ such systematic strategies. Example 10(b) provides a row-form diagram and identifies an RT_8 relation between two of the four row pairs in "Quartina" from Dallapiccola's *Quaderno Musicale di Annalibera*. Such associations are easy for students to find because they can apply the principles used to study individual pcs to complete row forms (Analytic Resource J). For example, the bottom of the example places (R)T_n-related rows beside one another, lists the transformations between adjacent ones,

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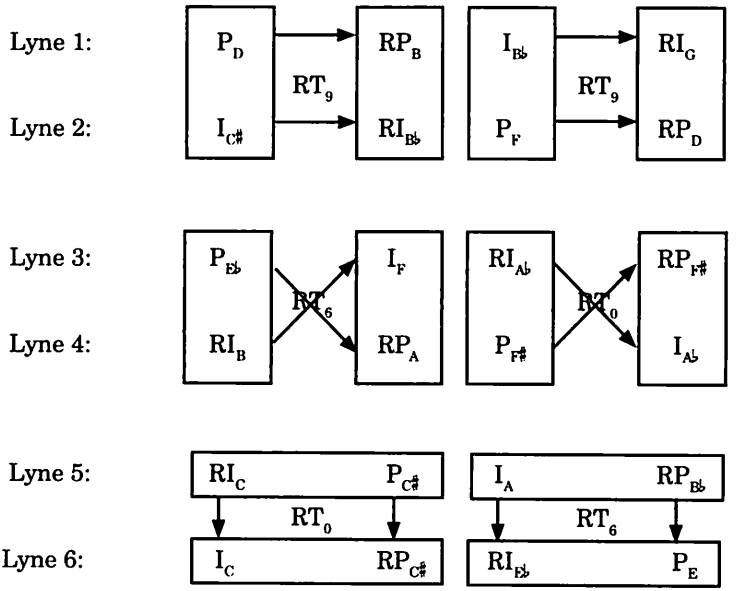
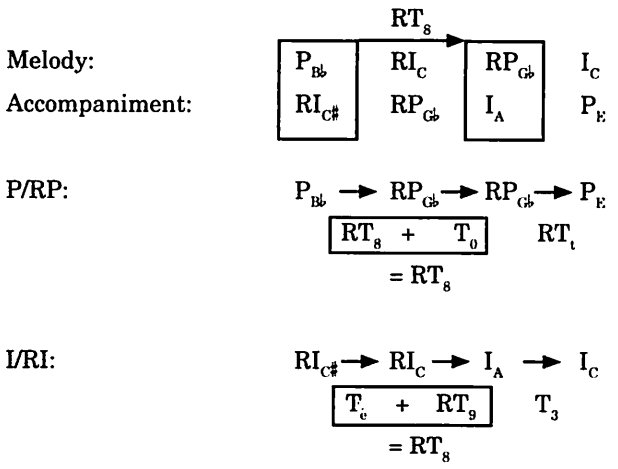
[16]We could just as easily identify RT_nI-related row-pair pairs by switching the orientation of the boxes. At the top of the array, row-pair pairs articulate RT_0I, in the middle RT_2I, and at the bottom RT_1I. A more complex and elegant interpretation is also available. The top lyne-pair articulates P_D-RP_B -P_F-RP_D and $I_{C\#}$-$RI_{B\flat}$-$I_{B\flat}$-RI_C, which are related by RT_0I and rotation by twenty-four positions (two complete rows). The other lyne pairs also state various transformed versions of these four-row sets. Such relations are mere child's play compared to the kinds of profound observations offered by Andrew Mead, *Introduction to the Music of Milton Babbitt*. (Princeton: Princeton University Press, 1994).

Example 10: Relations between multiple complete row forms.

a. Milton Babbitt, *The Joy of More Sextets*. Array blocks I-IV.



b. Luigi Dallapiccola, *Quaderno Musicale di Annalibera*, "Quartina."



and boxes the pairs of transformations that add to RT_8 (RT_8+T_0 and T_e+RT_9). We can relate large- and small-scale structures by comparing the transformations between row forms with the intervals between pcs. For example, the P/RP row forms articulate RT_8 - T_0 - RT_t, a large-scale replica of <80t>, stated by a fragment of the first melodic row statement of the movement (G-D♯-D♯-C♯ not shown.)

We can also check for large-scale *unordered* relations by treating the subscripts of (R)T_n-related rows as unordered sets. Taking a recent excerpt, {P_E $RP_{G♯}$ P_B} in Example 9(a) projects [037], creating a reference to the overlapping [037]s within each row form. Although the simultaneous unfolding of multiple row forms often obscures each row's overlapping [037]s, and the mixture of P and RP forms tends to conceal the large-scale [037], consequences of the relation rise to the fore in a clear and convincing way. For instance, $RP_{G♯}$'s overlapping [037]s begin the passage (E-G-B-D), followed immediately by three five-note row fragments that articulate RT_8-T_7 and therefore a large-scale projection of [037]. The relationship between small- and large-scale manifestations of [037] is so compelling because it starts at the beginning of the passage and unfolds continuously, with very little interruption from extra pcs.

Overall, if students are to benefit from this introduction to twelve-tone analysis, they must clearly understand the vignettes and their relationship to the framework, and must have some personal connection to the music. To this end, I recommend that the foregoing be translated into a pair of homework assignments that includes singing, playing, analysis, vignette comparison, and questions about the framework and its relationship to various vignettes. Provide directions as specific or general as your pedagogical situation dictates. Follow these assignments up in the usual manner, with copious classroom discussion, singing, and listening. With the analytic foundation firmly in place, students are equipped to study complete movements, where their appreciation of the repertoire deepens because they can study the *interaction* of these many and various interpretation types.

Schoenberg, "Trio" from the *Suite*, Op. 25.

From an historical perspective, it is attractive to begin the study of complete twelve-tone pieces with a work composed by the first master of serial technique. It is no trouble at all to find in Schoenberg's *oeuvre* pieces with compelling relationships of all the types mentioned above, but complete movements, or even parts of movements, that are short enough and straightforward enough for this pedagogical role are rare. The "Trio" from the *Suite for Piano*, seems well suited because it is brief, and because of the straightforward and consistent setting of six of its eight row forms.[17] As seen in Example 11, Rows 1-4, 7, and 8 are each presented linearly with the same characteristic rhythm. Moreover, this movement and the *Suite* as a whole draw on surface features from earlier style periods, providing points of familiarity for students entering strange and threatening territory. Most obviously, a *Suite* of binary dance pieces, each of which begins with a particular member of a twelve-tone row class, recalls the Baroque practice involving thematically-related movements in the same key.[18]

The steady streams of eighths and sixteenths in the Trio's characteristic rhythm and the canonic relationship of right and left hands create a texture that suggests the High Baroque. The recapitulation of the opening rhythm after the contrasting presentations of Rows 5 and 6 suggests classical Rounded Binary form. The subdivision of Rows 5 and 6 into tetrachords—indicated on the example by order positions 12-9, 8-5, and 1-4—parallels the usual practice of thematic fragmentation at this point in the binary form. Students can easily understand the less-than-straightforward realizations of Rows 5-6 (and the order reversals of A/C and A♭/C♭ in Rows 7 and 8 respectively) if they have been prepared during an introduction such as the one associated with Example 5 above.

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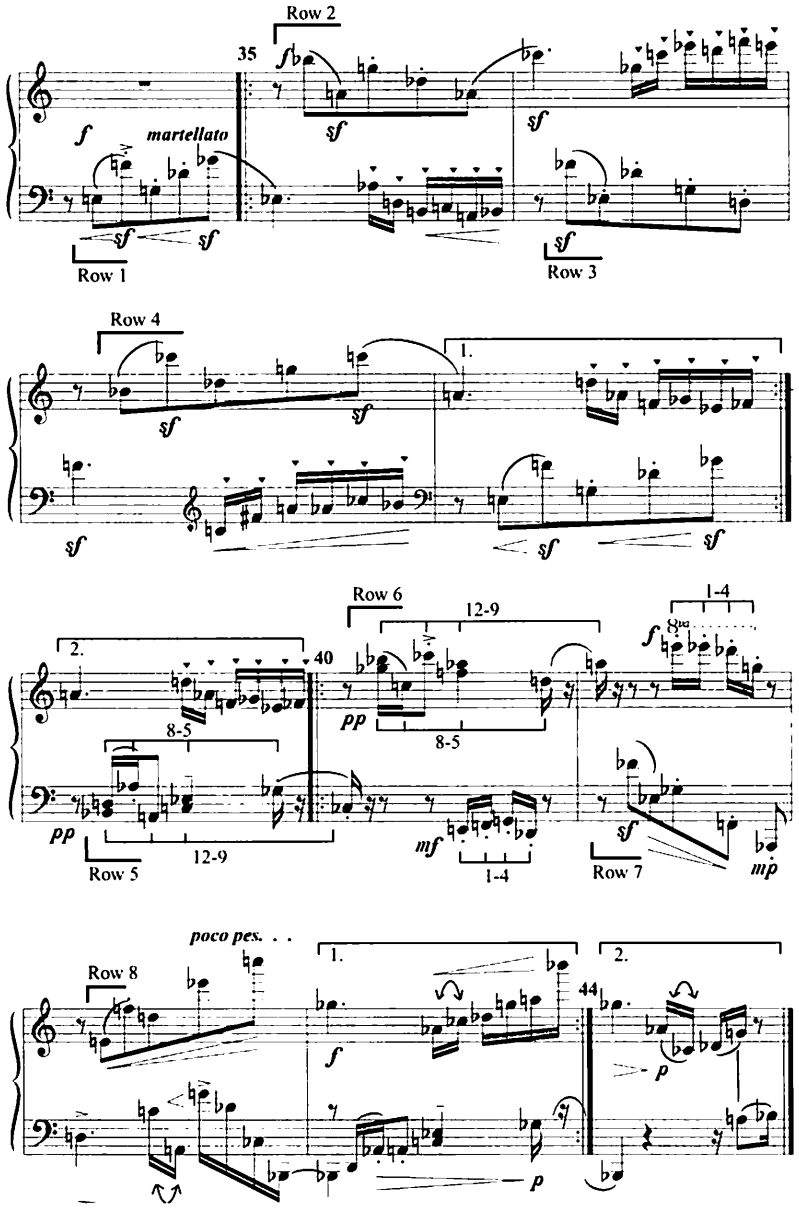
[17]Wennerstrom, *Anthology*: 174-6 provides the score for the "Menuett and Trio" and a series of helpful questions that could lead to many of the insights mentioned in this paragraph.

[18]See for example Froberger's *Suite No. 26 in B Minor* and Bach's *French Suite in D minor*, cited in Robert Gauldin, *A Practical Approach to Eighteenth-Century Counterpoint* (Englewood Cliffs: Prentice-Hall, 1988): 170-73.

Example 11: Schoenberg, *Suite for Piano*, "Trio." Used by permission of Belmont Music Publishers, Pacific Palisades, CA 90272.



As both Kostka and Straus suggest, several clear and compelling *intra-row* relationships arise from a straightforward study of the pc intervals and set-types involving adjacent pcs.[19] Example 12 shows RI-related segments $P(X)_G$ and $RI(X)_D$ near the row's middle, a <91> cycle near its end that includes a retrograde of B-A-C-H—yet another Baroque reference—and a pair of [0236] that helps to integrate the first two pcs of the row, which are uninvolved in these other relationships.[20] The rhythm makes the [0236] subsets easy to find; one begins the stream of eighth notes and the other the stream of sixteenths. Since all-interval set-types [0146] and [0137] are typically highlighted during the study of pre-serial atonal music, the appearance of [0146] here provides an added measure of familiarity for students.

The musical realization of Row 1 articulates two types of symmetry within the first six notes of the composition. First, the palindromic nesting of low, high, and mid-range pitches, and of slur, *sforzando*, and *staccato* articulations creates *temporal* symmetry (Example 12(b)). We can also hear approximate *pitch-space* symmetry by dividing the same hexachord into two registral strata as shown in Example 12(c). This symmetry is so nearly exact that changing only one of the middle notes—either G^3 to $A♭^3$ or $D♭^4$ to D^4—would render the symmetry precise.

Symmetry also organizes the large-scale structure of the binary form. The first half's row forms (P_E, $I_{B♭}$, I_E, and $P_{B♭}$) appear in retrograde in the second half (RP_E, RI_E, $RP_{B♭}$, and $RI_{B♭}$). The change in canonic pairings, $P_E/I_{B♭}$ and $I_E/P_{B♭}$ in the first half and RP_E/RI_E and $RP_{B♭}/RI_{B♭}$ in the second, calls to mind a similar procedure in the first four phrases of Milton Babbitt's "Play on Notes."[21] The E/B♭ row

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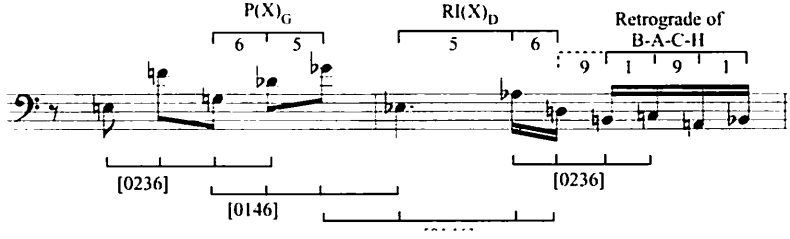
[19]See Kostka, *Materials*: 212-15 and Straus, *Introduction*: 136-38.

[20]The impressive history of B-A-C-H (= B♭-A-C-B) includes several other twentieth-century works: Schoenberg's *Piano Piece* Op. 23, No. 1, presented in Robert Morris, "Modes of Coherence and Continuity in Schoenberg's *Piano Piece* Op. 23, No. 1," *Theory and Practice* 17 (1992): 5-34; the "Simbolo" from Luigi Dallapiccola's *Quaderno Musicale di Annalibera* in David Lewin, *Musical Form and Transformation* (New Haven: Yale University Press, 1993): 1-15; and Anton Webern's *String Quartet*, Op. 28 in Robert Morgan, *Anthology of Twentieth-Century Music* (New York: Norton, 1992): 184-86.

[21]"Play on Notes" is based on P_C = C-E-F-D-G-A and several of its transformations. For example, phrase 1 states P_C in one voice against $RP_{F♯}$ in the other and phrase 2 features I_A against $RI_{E♭}$. Phrases 3 and 4 present

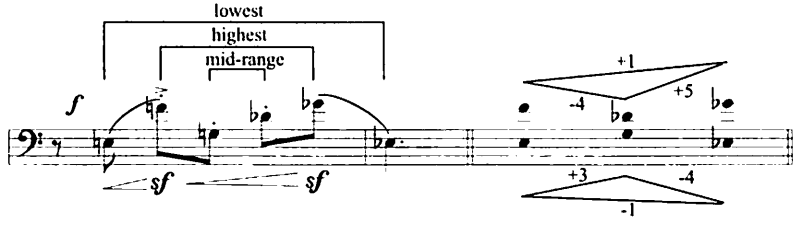
Example 12: Intra- and inter-row relations in the "Trio."

a. Intra-row relations, measures 34-35.



b. Temporal symmetry in Row 1.

c. Approximate pitch-space symmetry.



d. Pc invariance.

Order positions:	1	2	3-4	5-11	12	
Row 1: $P_F \rightarrow$	**E**	F	**GD♭**	G♭F♭A♭DBCA	**B♭**	← Row 5: RP_F
Row 2: $I_{B\flat} \rightarrow$	**B♭**	A	**GD♭**	A♭C♭G♭C E♭DF	**E**	← Row 7: $RI_{B\flat}$
Row 3: $I_E \rightarrow$	**E**	E♭	**D♭G**	DFCG♭AA♭C♭	**B♭**	← Row 6: RI_E
Row 4: $P_{B\flat} \rightarrow$	**B♭**	C♭	**D♭G**	CADA♭FG♭E♭	**E**	← Row 8: $RP_{B\flat}$

relationships, the appearance of these pcs at row begin- *and* end-points, and the dyad {GD♭}—held invariant as the third and fourth pcs of P_{E}, $I_{B♭}$, I_{E}, and $P_{B♭}$—all reinforce the special role of the tritone throughout the extended tonal and atonal repertoires.[22] These pc invariances are straightforward to hear in the first half of the Trio because the consistent rhythmic presentation places E/B♭ on the second eighth-note pulse of each measure, and {GD♭} on the fourth and fifth eighth-note pulses of each measure.

The analysis so far provides a useful introduction to many of the issues involved in the analysis of twelve-tone serial compositions, but there is more to this piece. For example, B-A-C-H references permeate the entire row, not just the last few notes. First, measure 34's offbeats articulate an incomplete transposition of B-A-C-H, E-G-G♭. (See Example 13(a).) Further, E-F-G♭-E♭ is a rotated transposition of H-C-A-B. This interpretation is particularly attractive because it allows each discrete hexachord of the row to be described in terms of a B-A-C-H reference and a tritone: E-F-(G-D♭)-G♭-E♭ and (A♭-D)-B-C-A-B♭.[23] Example 13(b) scripts an activity that reinforces this connection.

At mid-row, D♭-G♭-E♭-A♭ is a circle-of-fifths transformation of B-A-C-H, moving around the circle of fifths in the same way that B-A-C-H moves around the circle of half steps. As shown at the bottom of Example 13(a), D♭-G♭-E♭-A♭ moves down one fifth, then up three fifths, and then down one fifth; B-A-C-H moves down one half step, then up three half steps, then down one half step. This circle-of-fifths analysis is significant, not only because it deepens our understanding of B-A-C-H within this piece, but also because it sets the stage for

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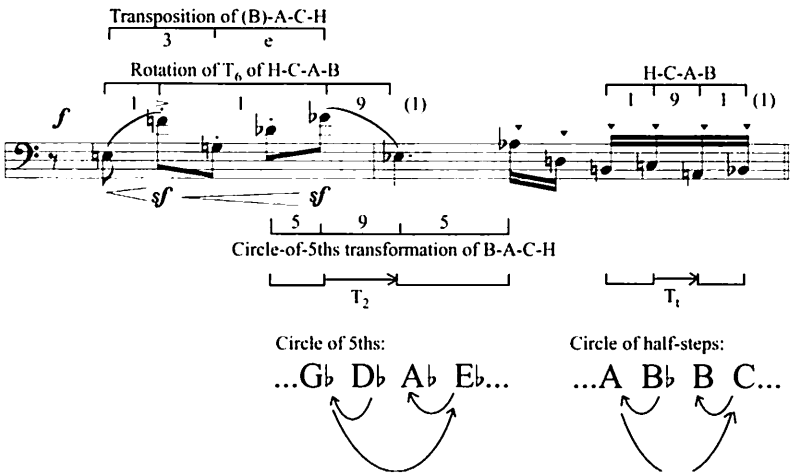
these rows in retrograde with the pairings switched $RI_{A}/P_{F♯}$ and RP_{C}/I_{E}. Amazingly enough, this scheme creates a series of interval-class 3 between the voices in phrases 1 and 2 and of interval-class 4 in phrases 3 and 4.

[22]The E/B♭ and G/D♭ relations are pointed out in Andrew Mead, "Some Implications of the Pitch-Class/Order-Number Isomorphism Inherent in the Twelve-Tone System," *Perspectives of New Music* 26/2 (1988): 109.

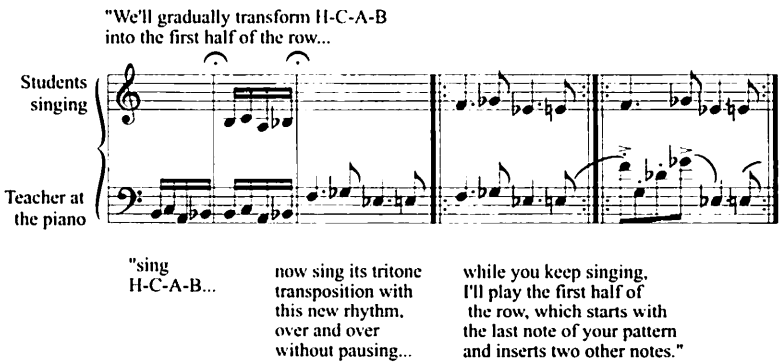
[23]Thank you to Renee McCachren for pointing this out. Overall, the B-A-C-H saturation calls to mind the maximal saturation of ordered collections in Mead, "Some Implications": 140-144. Mead saturates a twelve-tone row with ordered sets related to one another by transposition, rotation, and/or retrograde, and whose pcs are not necessarily adjacent.

Example 13: More intra-row relations.

a. B-A-C-H saturation in Row 1.



b. Singing the transformation of H-C-A-B by T_6 and rotation.



the study of more complex works, especially array-based compositions of Milton Babbitt, which use the transformation in larger-scale contexts.[24] Some of the benefit of this relationship can be enjoyed even in pedagogical situations that do not address the circle-of-fifths transformation *per se*. That is, we can hear the complementary relation between T_2 (D♭-G♭ / E♭-A♭) and T_t (B-C / A-B♭). On the whole the additional B-A-C-H references are a remarkably high analytic payoff given that they can be discovered through the relatively simple task of adding together adjacent pc intervals.[25]

Earlier we noted the contrast between the fragmented realizations of Rows 5 and 6 and the linear presentation of the other six rows. But why are Rows 5 and 6 realized precisely as they are? On one level the division of the row into tetrachords simply parallels similar treatment in other movements of the *Suite*, but what about the specific rhythms, pitch-space layout, and interactions of the tetrachordal layers? Consider the striking set-type relations in Example 14(a). Each row features set-type [0126] followed immediately by [0147]. Pitch-space layout, temporal ordering, and pitch invariance make the connections more vivid. Example 14(b) verticalizes the [0126]s and identifies their inversionally-related spacings, 6-4-1 and 1-4-6, 14(c) points out inversionally-related fragments F^4-G^3-$G♭^4$ and $B♭^2$-$A♭^3$-A^2, and 14(d) illustrates that each [0147] begins with $E♭^3$ and ends with $B^2 = C♭^3$.[26] Moreover, pitch-contour repetition highlights the

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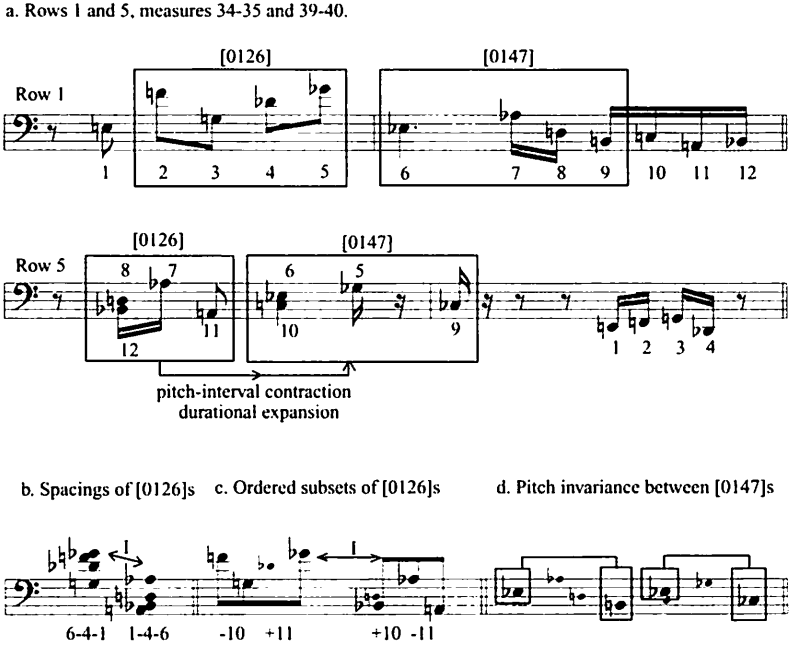
[24]As Morris points out in *Notes*, the circle-of-fifths transformation is precisely the standard jazz practice of tritone substitution, which most typically transforms a descending fifths root progression into a descending chromatic one. Properties and uses of the circle-of-fifths transformation are discussed in Hubert S. Howe, "Some Combinatorial Properties of Pitch Structures," *Perspectives of New Music* 4/1 (1965): 45-61; Daniel V. Starr, "Sets, Invariance, and Partitions," *Journal of Music Theory* 22 (1978): 136-83; Robert Morris, *Notes*: 121, and *Composition*: 65-66, 148-49; and Andrew Mead, *Introduction*: 36, 37, 111, 234-6, 255-63, 264, 271.

[25]For example, we can identify the T_2/T_t relationship involving D♭-G♭/ E♭-A♭ and B-C/A-B♭ by hearing that 5 + 9 and 9 + 5 each add to 2 (mod 12) within <595>, and that 1+9 and 9+1 each add to 2's complement, t, within <191>.

[26][0147] and [0126] also arise due to tetrachordal layering in the "Intermezzo" and "Praeludium," as discussed in Martha Hyde, "The Telltale Sketches: Harmonic Structure in Schoenberg's Twelve-Tone Music," *Musical Quarterly* 66 (1980): 568. Elsewhere Hyde points out that side-by-side

Example 14: More intra-row relations: comparing rows 1 and 5.



[0126] and [0147] subsets in Row 5; in terms of motivic transformation (Analytic Resource C), we can turn the former into the latter by reducing pitch-interval size (major third to minor third, diminished octave to perfect fifth, etc.) and lengthening attack-point durations (sixteenth- sixteenth to quarter-eighth).

[012346] arise from tetrachordal layering at the beginning of the "Menuett" and in linear row presentations at order positions 1-6 and 7-12; see Martha Hyde, "A Theory of Twelve-Tone Meter," *Music Theory Spectrum* 6 (1984): 15.

Row Combination

These additional insights deepen our understanding of the movement and create more links to other repertoires and analytic techniques, but—other than noting the tritone relationships created by the family of row forms—we still have yet to address row combination. It is tempting not to bother because so many musical details seem explained by the relations cited above. Further, the idea of linear presentations of twelve-tone "rows"—much less their canonic combination—emerged relatively late in the *Suite*'s compositional process, only *after* the composition of several movements based on the layering of the three tetrachords that would eventually compose "the row."[27] Therefore, how many intriguing row-combination relationships could Schoenberg possibly work into a strict inversion canon, apparently without the luxury of planning them out from the beginning of the compositional process?

But failing to consider one of the principal twelve-tone categories renders our understanding of the work, in the most basic sense, incomplete. We must also remember the excerpt from "Composition with Twelve Tones" cited at the outset of this paper—what makes Schoenberg a "master" of row combination rather than an "ignoramus?" Predictably, the answer is intriguing and complex. There is not one overarching, systematically-applied compositional plan, but rather a string of several types of *ad hoc* relations—at various times supported by and conflicting with surface features of the canon. At times the analysis is hard work, but it does arise from the general analytic procedures outlined in the first part of this article. The remainder of the paper points out five row-combination situations, suggests ways to include such insights in pedagogical presentations, and lists more advantages of doing so.

First, as shown on Example 15, Rows 1 and 2 in combination create two trichordal set-type pairs. The correspondence of set-type boundaries with metric divisions parallels a segmentation strategy common in the harmonic analysis of tonal music. Such simplicity

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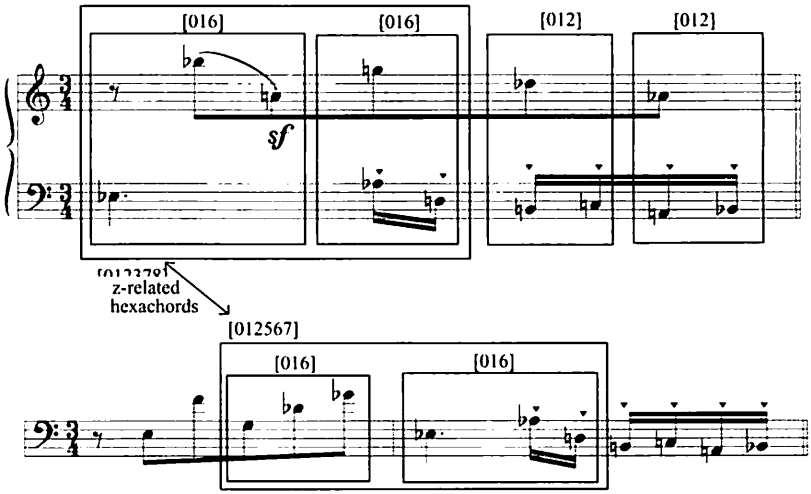
[27]For an enlightening account of the *Suite*'s sketches and chronology of composition see Ethan Haimo, *Schoenberg's Serial Odyssey: The Evolution of His Twelve-Tone Method, 1914-1928* (Oxford: Oxford University Press, 1993): 84-103.

Example 15: Rows 1 and 2 in combination, measures 34-35.



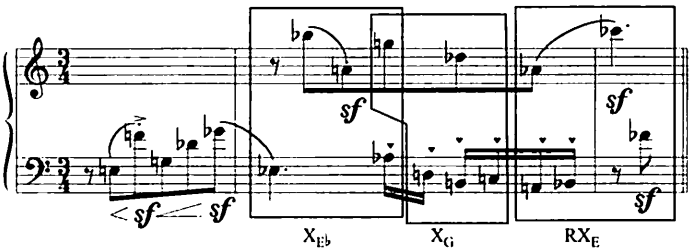
does not continue for the remainder of the piece; similar segmentation of later measures yields an ever-increasing variety of set-types. The pair of [016] also recalls the side-by-side [016] in the row. These [016] pairs articulate z-related (and circle-of-fifths-related) hexachordal set-types [012567] and [012378]. All of these relationships follow from a straightforward study of set-types formed by adjacent "vertical slices" of the texture as suggested in Analytic Resource G2.[28]

Further investigation of this measure reveals that Rows 1 and 2 in combination also assert a series of (R)T_n-related fragments, $X_{E\flat}$–X_G–RX_E. Parts (b)–(e) of the example provide a series of steps to practice hearing the relationships. Example 16(b) presents the pcs

[28]Hyde, "Sketches" shows that [0236], also in the row, arises from row combination in the "Praeludium," m. 1.

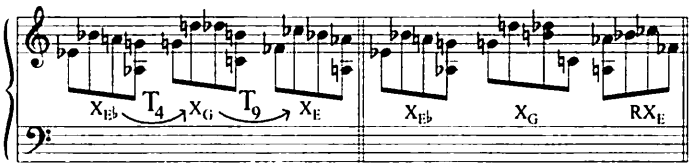
Example 16: Row combination: $X_{E\flat}$-X_G-RX_E.

a. Measures 34-36.



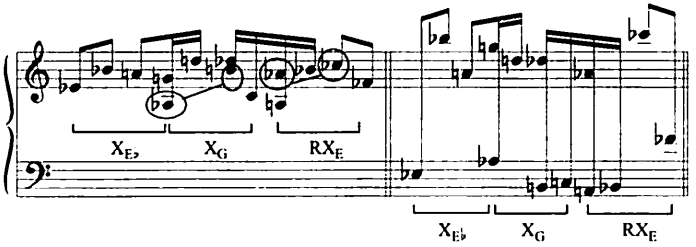
b. consistent pitch layout and rhythm

c. ordering changes

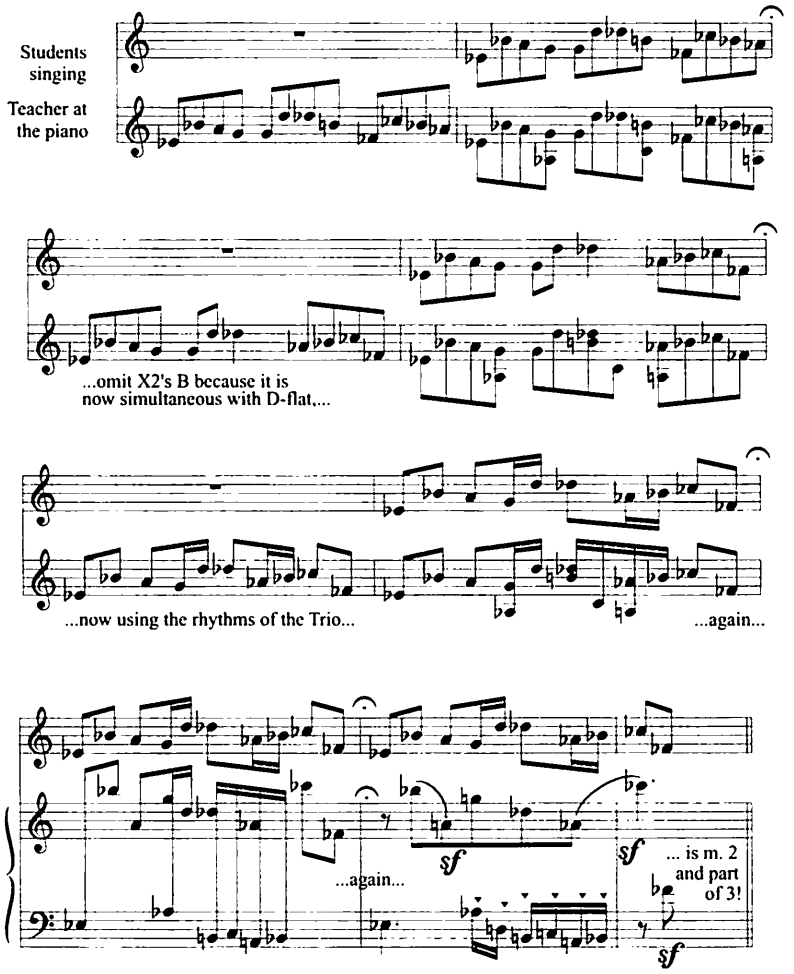


d. rhythmic changes

e. registral changes



Example 17: Classroom activity based on Example 16.



of the X subsets with temporal orderings and attack-point rhythms that correspond precisely to that of $X_{E\flat}$ in the score. The consistent pitch-space layout is somewhat faithful to the score because A♭ is below G in $X_{E\flat}$ and A is below A♭ in $(R)X_E$. Example 16(c) transforms X_E into RX_E and makes one small ordering adjustment to X_G, moving B one position earlier to coincide with D♭ rather than C. Example 16(d) introduces Schoenberg's rhythms and elides $X_{E\flat}$ and X_G. These changes create added stability due to the repetition of A♭-B(=C♭) in X_G and RX_E in an eighth-note attack-point rhythm. Example 16(e) adjusts the registral placement of some pitches to correspond with the score. Part (e) may be transformed into the actual score simply by sustaining some notes through the onset of others to create the two contrapuntal lines. Example 17 scripts a one-minute activity that enables the entire class to enjoy these analytic results.

Where pedagogical context allows, we can help students to learn to find—and not merely enjoy—such partially-ordered relations by gradually unveiling them as we step through the framework's two-step process. The search for row combination relationships begins at the first juxtaposition of pcs from different row forms, therefore the initial pattern is measure 35's E♭-B♭, which articulates pc-interval 7 (Step 1). A search for copies (Step 2) in the next few beats of the composition uncovers four dyads, listed in column 1 of Example 18. G-D and D♭-A♭ each articulate pc-interval 7, and so each is related to the pattern by T_n and RT_nI. E♭-A♭ and C♭-F♭ each articulate pc-interval 5, and so each is related to the pattern by RT_n and T_nI. After extending the pattern to E♭-B♭-A (Step 1), the search for copies involves checking the continuation of the copies of E♭-B♭ (Step 2). For example, since G-D = T_4(E♭-B♭) = RT_5I(E♭-B♭), we search for T_4(E♭-B♭-A) = G-D-D♭ and RT_5I(E♭-B♭-A) = A♭-G-D. Column 2 lists the copies being sought followed by a question mark and one of three responses: YES indicating its presence in the music, NO its absence, or a (partially) ordered set indicating a re-ordered version. Column 3 shows the results of extending the pattern to E♭-B♭-A-{A♭G} (Step 1) and searching for copies (Step 2). A fourth pass through the process identifies no new correspondences, but this is certainly not troubling because $X_{E\flat}$–X_G–RX_E accounts for *each* pc in the excerpt under study! Although it may be impractical to step through the process in a brief undergraduate survey, such complex examples are indispensable in

Example 18: $X_{E\flat}$-X_G-RX_E and the Two-Step Search Process.

Pass:	1	2	3
Step 1:	<E♭B♭>	<E♭B♭A>	<E♭B♭A{GA♭}> = $\mathbf{X_{E\flat}}$
Step 2:	<GD>	<GDD♭>? YES	<GDD♭{BC}>? <GD{BD♭}C> = $\mathbf{X_G}$
		<A♭GD>? <{GA♭}D>	<{AB♭}{GA♭}D>? NO
	<D♭A♭>	<D♭A♭G>? <GD♭A♭>	<GD♭A♭{FG♭}>? NO
		<DD♭A♭>? YES	<{EE♭}DD♭A♭>? NO
	<E♭A♭>	<E♭A♭A>? NO	
		<DE♭A♭>? <E♭A♭D>	<{CD♭}E♭A♭D>? NO
	<C♭F♭>	<C♭F♭F>? NO	
		<B♭C♭F♭>? YES	<{A♭A}B♭C♭F♭> YES = $\mathbf{RX_E}$

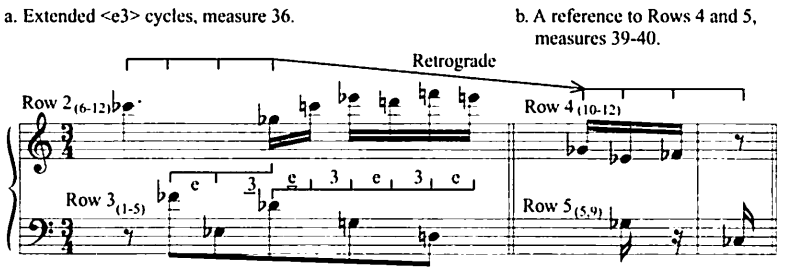
a graduate theory curriculum where students need to learn how to generate original analytic findings independently.

As is evident from the subscripts, $X_{E\flat}$–X_G–RX_E refers to E-G-E♭, the lower melodic strand of the first half of Row 1. E-G-E♭ articulates T_3-T_8 and $X_{E\flat}$–X_G–RX_E the complementary transpositions in the reverse order T_4-(R)T_9. Since E-G-E♭ and $X_{E\flat}$–X_G–RX_E overlap at the downbeat of measure 35, they are easy to hear in sequence, and this interpretation provides an elegant way to hear from E at the beginning of Row 1 to E at the beginning of Row 3.[29]

Rows 2 and 3 in combination create new instances of pc-intervals 3 and e—underlined on Example 19(a)—which further saturate the polyphony with B-A-C-H. $F\flat^4$-$E\flat^3$-$G\flat^5$ articulates attack-point eighths

[29]Since Rows 3 and 4 are a precise T_8I transformation of Rows 1 and 2, the relationship just discussed recurs transformed by T_8I, extending from $F\flat^4$ at the beginning of Row 3 to the first ending's E^3, the beginning of the repetition of Row 1. Overall E-G-E♭/X1-3 and its T_8I copy provide an intensely unified way to hear the entire first half of the composition anchored around pitch-class E.

Example 19: Rows 2 and 3 in combination.



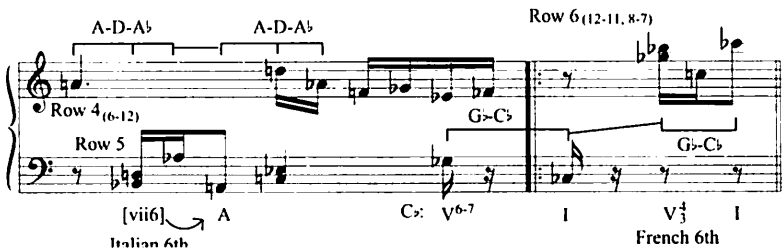
and the extension of Row 2's <e3> cycle C^6-$E\flat^6$-D^6-F^6-E^6 back to include $D\flat^4$, sixteenths. Like E-G-E♭/$X_{E\flat}$–X_G–RX_E, this pair of fragments begins and ends with pitch-class E. Rows 2 and 3 in combination also set up a long-range connection to the passage where Rows 4 and 5 interact. Example 19(b) points out the correspondence between C♭-F♭-E♭-G♭ and its retrograde; the former unfolds in attack-point eighths and the latter precisely twice as fast.

Row combination strategies also enrich our experience of the second half of the composition. First, Example 20(a) addresses the combination of Rows 4, 5, and 6. Side-by-side statements of A-D-A♭, each unfolding with the same attack-point rhythm, provide local continuity at the entrance of Row 5, further rationalizing both the superposition of Row 5's 12-9 and 8-5 tetrachords and their rhythmic setting. Similarly, a pair of G♭-C♭ that articulates attack-point eighths creates stability at the entrance of Row 6. Further, A-D-A-D, which is embedded within the pair of A-D-A♭, maps onto G♭-C♭-G♭-C♭ under T_9. The relationship is especially clear because each segment unfolds in an eighth-note attack-point rhythm. Since one eighth-note pulse intervenes between A-D-A-D and G♭-C♭-G♭-C♭, their metric orientations contrast—the former begins *on* the quarter-note beat, the latter *off*.

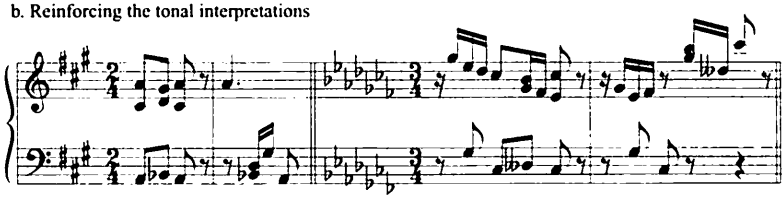
This passage also articulates fleeting tonal progressions. First, an Italian augmented sixth chord, B♭-D-G♯ (spelled as A♭) tonicizes A,

Example 20: Rows 4, 5, and 6 in combination.

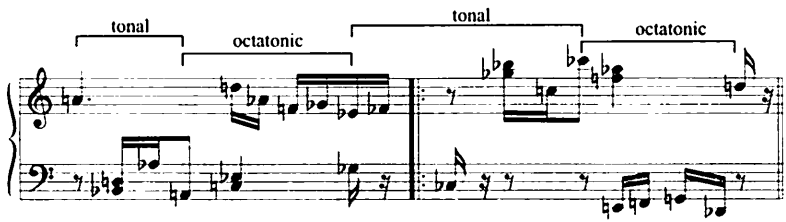
a. Segment repetition and tonal allusion, measures 39-40.



b. Reinforcing the tonal interpretations

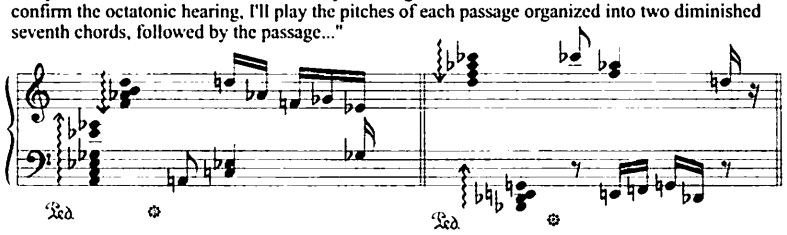


c. Tonal/octatonic dovetailing



d. Reinforcing the octatonic interpretation

"As you know, an octatonic collection may be thought of as two diminished seventh chords. To confirm the octatonic hearing, I'll play the pitches of each passage organized into two diminished seventh chords, followed by the passage..."



an interpretation strengthened by the octave (!) on beat two.[30] Later, dominant-tonic progressions articulate C♭ major. The first case makes use of an implied 5-6 technique, in which the sixth (E♭) replaces the fifth (D♭) above the dominant bass note (G♭). In the second case G♭-B♭-D𝄫 (spelled C), a dominant triad with a lowered chordal fifth (or an incomplete "French" 4/3 chord), resolves to the tonic note C♭.[31] Due to the passage's brevity, non-tonal surroundings, incomplete chords, and variable texture and register, these interpretations may not be obvious at first. To confirm the tonal hearings, isolate the fragments and juxtapose them with conventional realizations of the progressions as suggested in Example 20(b), or sing with solfége syllables the C♭-major reference as a class (so-mi-fa-do-ti-ra-do).[32]

Hearing the passage in terms of these ephemeral tonal allusions lends support to Joseph Straus's assertion, made during his analysis of the "Gavotte" from the *Suite*: "[Schoenberg] creates beautiful new works that subtly, and ironically, imitate old ones."[33]

As shown in Example 20(c), the tonal fragments alternate and dovetail with octatonic ones. These octatonic passages create local continuity because there are two of them, but they also augment curricular continuity, both by referencing ubiquitous octatonicism in the extended tonal repertoire and by forging links to other of Schoenberg's works.[34] Example 20(d) shows one possible way to

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[30]Using jazz terminology, the incomplete B♭^{7} chord B♭-D-A♭ may be interpreted as a tritone substitute for E^7, the dominant of A.

[31]As Daniel Harrison points out in "Supplement to the Theory of Augmented-Sixth Chords," *Music Theory Spectrum* 17/2 (1995):170-195, a major *triad* with lowered fifth is not mentioned in most recent undergraduate theory texts. In this context it may be characterized as "a defective Italian or incomplete French sixth." (182) The article shows that the chord *is* one of the augmented-sixth chord types presented in Louis and Thuille's *Harmonielehre* (1907).

[32]To test the tonal interpretation and have a little fun, play the C♭-major fragment for students (and perhaps good-natured colleagues) who have not studied or performed the piece, asking them to hazard a guess as to composer and approximate date of composition! (Do this outside the context of twelve-tone pedagogy to produce unbiased results.)

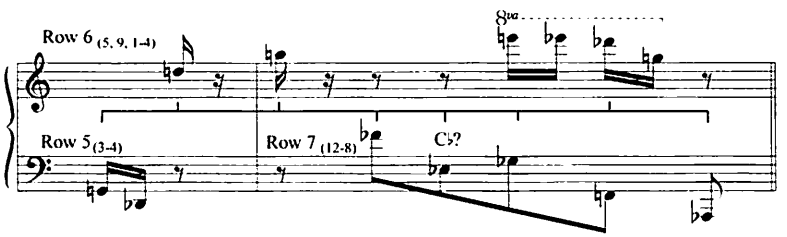
[33]Straus, *Introduction*: 136.

[34]See for example the *Piano Piece*, Op. 33a, in which tetrachordal division and consistent row pairing creates three octachords, one of them "the" octatonic collection.

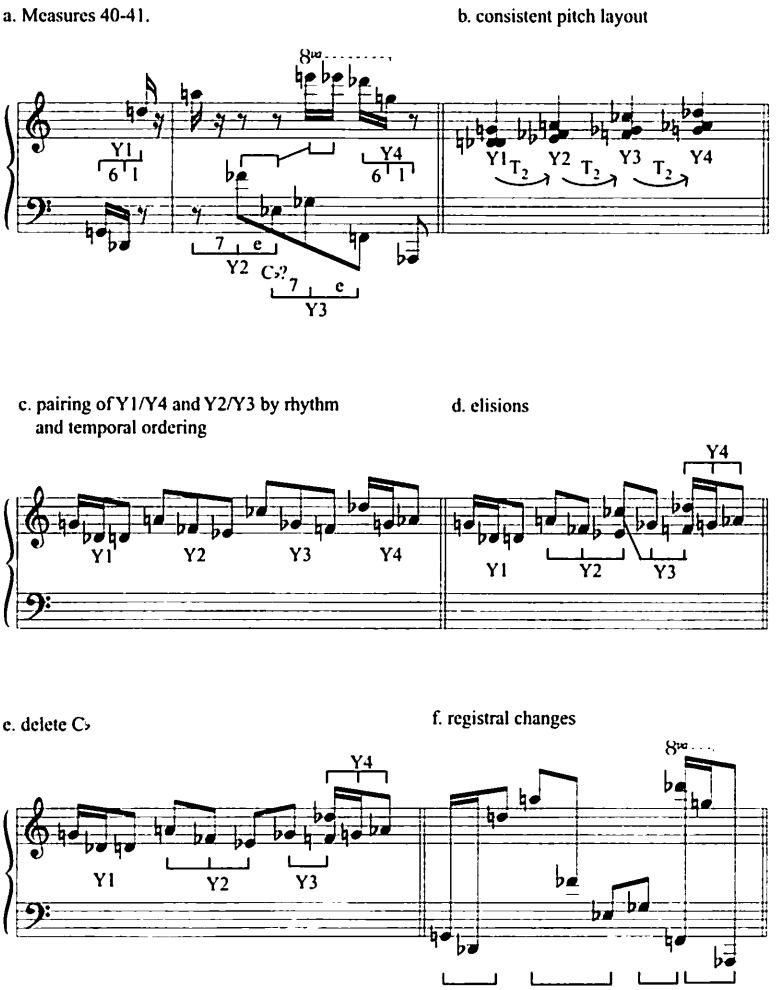
highlight the octatonic hearings in a classroom situation. With the tonal and octatonic interpretations in place separately, it is relatively straightforward to assemble them into a coherent whole because the overlap is salient and predictably placed. The first overlap occurs on beat two of measure 39 at the articulation of A^2, the lowest note of the measure and the tonic of the preceding tonal reference. The last overlap is precisely one measure later (the corresponding place in the inversion canon) at the articulation of $C♭^6$, the highest note of the measure and the tonic of the other tonal reference. The middle overlap point is precisely halfway between the others. Overall, this dovetailing tonal/octatonic scheme organizes two full measures into a single continuous interpretation.

During the ends of Rows 5 and 6 and the beginning of Row 7, a <7> cycle provides local coherence. (Consult Example 21.) The cycle extends from G to A♭, skipping only C♭ along the way. The consistent eighth-note attack-point rhythm—which even saves a place for the missing C♭—makes it easier to follow the series, which is somewhat concealed by the large and inconsistent pitch intervals, as well as by the presence of additional notes. This sequence can be thought of as two interlocking T_2 cycles, G-A-(C♭)-Db and D-F♭-G♭-A♭. Oddly enough, each T_2 cycle articulates a straight contour, G^2-A^5-$D♭^7$ upwards, and D^5-$F♭^4$-$G♭^3$-$A♭^1$ downwards. Grouping the cycles into a series of T_2-related [05]s reveals a clear relationship to the middle of the row; compare {DG}-{F♭A}-{G♭(C♭)}-{A♭D♭} with Row 1's {D♭G♭}-{E♭A♭}.

Example 21: A <7> cycle in Rows 5, 6, and 7; measures 40-41.



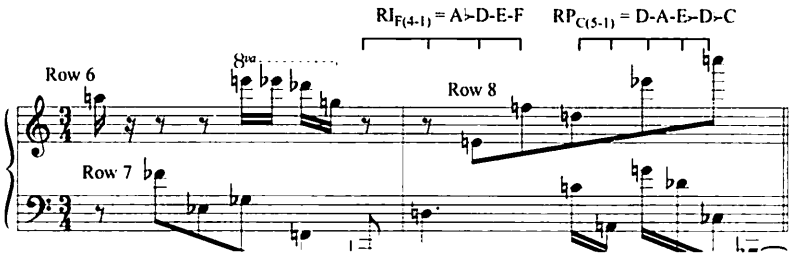
Example 22: T_2 cycle of [016] in Rows 5, 6, and 7.



The other notes in the passage, D♭-E♭-F-G, *also* articulate a T_2 cycle. By combining all three cycles we uncover a series of T_2-related [016]s, labeled Y1-Y4 on Example 22(a). Y1 and Y4 each articulate pc intervals <61> in a sixteenth-note attack-point rhythm. This clear correspondence marks the beginning and endpoints of the cycle. The relationship of Y2 and Y3 is nearly as close. Y2 articulates <7e> in an eighth-note attack-point rhythm, and Y3 would also, were it not for the missing C♭. The only other complicating factor here is E-E♭ during Y3, a repetition of the last two pcs of Y2. As with $X_{E♭}$–X_G–RX_E above, we provide a series of steps to rehearse the hearing of Y1-4. Example 22(b) presents Y1-Y4 as a series of parallel, close-position chords, part (c) incorporates the Trio's temporal ordering and rhythms, (d) adds elisions, (e) omits C♭, and (f) adjusts the registral layout to correspond to the piece. Example 22(f) can be transformed into the actual score by adding the extra E-E♭ and sustaining some notes through the onset of others to create contrapuntal lines. Example 22 may be transformed into a classroom activity in the manner of Examples 16/17.

Finally, Rows 7 and 8 combine to articulate fragments of other row forms, bracketed on Example 23. The left hand's $A♭^1$-D^3 combines with the right hand's E^4-F^5 to state order positions 4-1 of RI_F. This fragment is straightforward to hear for a number of reasons. First, the right-hand part is silent during the left hand's $A♭^1$-D^3, and the left-hand part is stationary during the right hand's E^4-F^5, so no other notes interrupt or camouflage it. Second, its beginning is easy to find because $A♭^1$, the lowest note of the movement, concludes the relationships shown in Examples 21 and 22. It is curious that this $A♭^1$ is not beamed to the preceding eighth notes as in all other such situations in the piece; perhaps a subtle indication that this $A♭^1$ is a beginning. Third, the fragment has consistent rhythmic and pitch-space layouts, that is, an eighth-note attack-point rhythm and ascending intervals of between one and two octaves each. Finally, the RT_1 relationship with the immediately preceding E^7-$E♭^7$-$D♭^7$-G^6, order positions 1-4 of Row 6, makes blatantly obvious its row derivation. One unfolds in sixteenths and the other in eighths. One articulates descending intervals of less than an octave, <–1 –2 –6>, the other ascending intervals exactly one octave larger, <+18 +14 +13>.

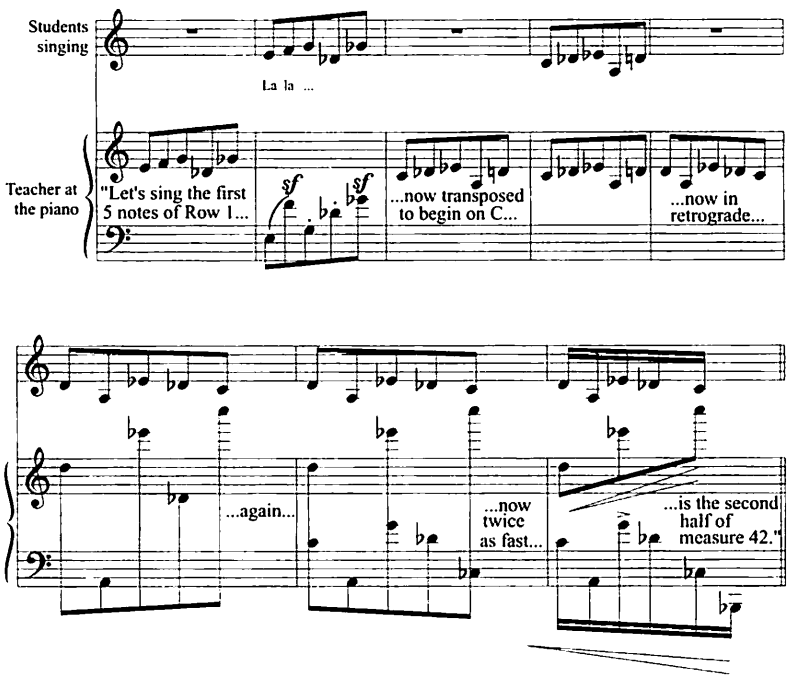
Example 23: Rows 7 and 8 in combination: fragments of RI_F and RP_C; measures 41-42.



Immediately following, Rows 7 and 8 co-operate to state order positions 5-1 of RP_C, D^5-A^2-$E♭^6$-$D♭^4$-C^7. Unlike the previous row fragment this one must be pulled from the texture because it unfolds along with some extra notes (C^4, G^4, and $C♭^3$). Nonetheless, the fragment is straightforward to follow because these omitted notes are the lower notes of simultaneously struck dyads. The result is a strict alternation between right- and left-hand parts in a consistent sixteenth-note attack-point rhythm. This straightforward aural strategy is made possible by the order inversion of C and A within Row 8, which places A on a metrically weak sixteenth so it is struck *alone*, after D and before E♭. Without the order change, the fragment would be much more difficult to follow. Venturing for a brief moment onto the precarious limb of compositional intent, the presence of the RP_C fragment is a *reason* for the order inversion of A and C. Example 24 scripts a one-minute classroom activity that gradually transforms the movement's opening into the RP_C fragment identified. Instructors can easily construct a similar exercise to dramatize the relationship between the RI_F fragment and E^7-$E♭^7$-$D♭^7$-G^6 that immediately precedes it.

The presence of these row fragments provides completion to the piece in at least two ways. First, despite the varied and seemingly *ad hoc* nature of the row combination strategies, they are systematic

Example 24: Classroom activity based on Example 23.



in that they refer to each part of the row: <19>/<e3> cycles at order positions 8-12 (Example 19), T_2-related [05]s at order positions 4-7 (Example 21), and RI_F and RP_C fragments articulating order positions 4-1 and 5-1 respectively (Example 23). Second, we noted earlier that RP and RI row forms in the second half of the piece answer the first half's P and I forms, but that Rows 5 and 6 state order positions 1-4, not 4-1 as R and RI forms normally would. The RI_F and RP_C fragments can be viewed as compensating for this anomaly.[35]

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[35]The combination of two row forms to articulate fragments of other row forms engages Daniel Starr's "Derivation and Polyphony," *Perspectives of New Music* 23/1 (1984):180-257. The article deals with *complete* row forms as in the following example: in the pc string A38741B25096, 30947A85216B, the underlined pcs articulate row P, the non-underlined pcs $RT_9I(P)$, the first twelve pcs $T_7(P)$ and the last twelve $RT_2I(P)$.

Conclusion

Making students aware of at least some of these row combination strategies will help to give a sense of Schoenberg's compositional genius. If our study of the movement does *not* address row combination, then we run the risk—however unintentionally—of suggesting that twelve-tone composition requires little skill. After all, canonic works—twelve-tone, Baroque, or otherwise—are masterpieces *not merely* because they superimpose contrapuntal voices related to one another by transposition or inversion, but because they do so within some strict harmonic framework. Since twelve-tone students have usually spent two years studying harmony and voice-leading in tonal music, they are prepared for, even expecting, an approach that addresses both vertical and horizontal relationships. Furthermore, Schoenberg's comments about the Trio quoted at the outset of the paper and in the following excerpt leave little question about the significance he placed on row combination. In *Linear Counterpoint: Linear Polyphony* (1931), a strongly worded condemnation of the theories of Ernst Kurth and his followers, Schoenberg writes:

> "But has it occurred to Mr. Kurth and his followers that there must be some bond of cohesion between a number of parts intended to be heard simultaneously and meaningfully, and that this bond can cohere only in some other direction than the linear? ... *Only the relationship of several rows one to another, the vertical aspect of the line gives them their significance*!"[36] (emphasis added)

Even so, with space in the twelve-tone curriculum at a premium, one might argue that it is more important to study standard methods such as hexachordal combinatoriality. Perhaps, but students can get a sense of the *evolution* of Schoenberg's compositional approach by studying the "Trio," a movement from Schoenberg's *first* completely twelve-tone serial work, followed by other works that feature classical combinatoriality. Characterizing Schoenberg's twelve-tone *oeuvre* as the result of a developing historical process rather than as

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[36]Arnold Schoenberg, "Linear Counterpoint, Linear Polyphony," *Style and Idea:* 231.

a *fait accompli* encourages students to empathize with Schoenberg. Further, the 'messy' and varied nature of the Trio's row combination strategies provides a marked contrast to more systematic combinatorial methods. Such analytic variety also reflects the diversity within each undergraduate class. Since some students will be more attracted to the elegance of combinatorial designs and others to the wild and various strategies of the Trio, the presentation of both types of relationships should enrich both groups of students. Finally, the irregularity of the Trio's row combination strategies may help some students to understand that, in the words of Stefan Kostka, "the music of classical serialism is not especially 'mathematical,' and it is not composed mechanically and without regard to the resulting sound or the effect on the listener.[37] It is regrettable if even one student does not sense this intuitively, but it is true that some occasionally lose sight of the musicality of the twelve-tone approach amidst the numerical representations and symmetrical structures of pitch-class theory. Besides, as we have shown these row combination strategies provide wonderful opportunities for classroom activities that also aim to alleviate student skepticism.

Clearly there is a lot more to the Trio than its straightforward surface might suggest, an intense melange of various intra-row relations, realization and row combination strategies, and connections to other pieces and repertoires. It is not a simple piece and our pedagogical presentations must not pretend that it is. But this does not mean that we need to bewilder our students. The analytic framework and the resulting organized approach provide guidance. Teachers can also contribute leading questions as dictated by student skill level, time in the curriculum, and other factors, and can reinforce the relationships through classroom vocalization. Since the Trio works on so many levels, and since even its more complicated relationships are amenable to engaging and musical classroom activities, it can be the basis for a profoundly enriching experience for students of various skill levels.

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[37]See Kostka, *Materials*: 222.

Melodic Dictation Scoring Methods: An Exploratory Study

Jeffrey L. Gillespie

The task of melodic dictation has long been an established component of the aural skills curriculum, having earned its place as a valuable and multi-faceted learning tool (see Rogers [1984], Karpinski [1990]). An entire chapter is devoted to melodic dictation in Karpinski (2000), where the author calls the task "an important focal point of undergraduate music training" and states: "Working with melodic dictation can help to develop some very important musical skills such as musical attention, extractive listening, short-term musical memory, musical understanding, and notation" (p. 62).

Along with the rich resources in melodic dictation for developing a variety of musical skills, instructors are faced with the complex task of determining how best to evaluate dictation work. Karpinsky (2000) offers three main principles for guiding evaluation of dictation: "First, there should be some absolute standard against which the work is judged--reported, for example, in the form of a percentage or letter grade. Second, feedback should be given with regard to precisely what was correct and what was incorrect in each dictation. Third, when appropriate, suggestions should be made about what to do to correct systemic problems, whenever possible" (p. 103). Karpinsky (2000) emphasizes the crucial need "to offer meaningful, usable feedback for listeners' future development" (p. 110). This author wholeheartedly agrees with the pedagogically-sound principles outlined by Karpinsky. As instructors, we face the constant challenge of finding ways to incorporate these principles into the practical classroom.

To date, there are very few published methodologies for evaluating melodic dictation. Among them are the guidelines for

the standardized Graduate Record Examination (GRE) in Music and the Advanced Placement (AP) Examination in Music Theory. Both exams include only tonal melodies for dictation and evaluate both pitch and rhythm of solutions. The somewhat more elaborate system of the GRE does not accept enharmonic equivalents as being correct, but it does give "points back" for segments that are correctly notated but metrically shifted to an improper position. The AP exam does not give points back for such shifted segments. Neither the GRE nor the AP exams provide any feedback other than point scores.[1] Blombach's MacGamut 2000 computer software program improves upon these evaluation methods not only by accounting for temporal shifts within a response, but by providing markings on the music indicating the locations of errors, as well as messages describing the types of errors that are made. As an added pedagogical "bonus," the program checks for segments in which contour is maintained, despite the presence of pitch errors. Such contour-matching segments are marked for the respondent to see, even though point credit is not given in such cases. The scoring methodologies for all three of these sources are useful to study. However, the GRE and AP exams serve as evaluative tools, while MacGamut serves a pedagogical function. It is refreshing to see MacGamut reporting more to the students than simply a basic percentage score on a dictation exercise. Of Karpinsky's principles discussed earlier, all are represented in MacGamut except for suggestions on how to correct mistakes.

For the present study, several questions were considered in exploring how decisions are made by aural skills instructors in evaluating melodic dictation solutions. What factors should be involved in an instructor's diagnosis of error? Should evaluation methodology be affected by a melody's characteristics, such as its degree of tonal stability, the presence of melodic sequence, or other distinctive features? Should certain types of errors be weighed differently than other types? In this study, these questions, as well as others, are addressed through the results of two surveys that examine scoring methods and preferences among college instructors with interest

[1]See Phillips (1998) for more detailed discussion of AP and GRE scoring guidelines, as well as his own application of those models in the classroom, particularly with sight singing.

and experience in aural skills. The first survey, which is the more exploratory of the two, was designed to gather information on how instructors score dictation solutions. Information gathered from Survey I was influential in designing the more controlled Survey II, in which instructors were asked to rank several scoring methods as applied to specific melodies and dictation solutions. Of particular interest were melodies that contained varying degrees of tonal stability, including melodies that could be considered "non-tonal." Because of the complexity of the test material, rhythm was not included as a variable for study, although all melodies did include rhythm. Since rhythm is an integral and significant component of melody, it certainly deserves attention in a later study.

SURVEY I

In the initial survey (Survey I), six contrasting melodies were presented as hypothetical melodic dictation stimuli. The six melodies were comprised of two diatonic melodies (one major key and one minor key), two tonal melodies with some chromatics (one major key and one minor key), and two melodies that could be considered "non-tonal" or "tonally ambiguous." Presented with each melodic stimulus were two sample dictation "solutions" that were specially constructed by the researcher to contain a variety of different pitch errors. Errors included incorrect or missing accidentals, inappropriate enharmonic spellings, incorrect intervals resulting in transposed segments, incorrect structural pitches, missing segments (portions left "blank"), and in some cases, complete loss of tonal center. For reasons of simplicity, variables of contour and rhythm were not included in Survey I; thus, all solutions contained the correct contour and correct rhythm.

The survey was distributed to a group of 13 college-level music theory instructors with experience in teaching aural skills. Respondents were asked to score each solution on a 16-point scale and to provide detailed explanations of the scoring methodology they chose to use.

Respondents to Survey I revealed preferences for an assortment of scoring methods. For the two diatonic and two tonal-chromatic

melodies, the most popular scoring method was to count pitch errors, with no consideration given for any transposed segments of the melody.[2] There were several scorers in Survey I, however, who did choose to give half credit back for transposed segments. Another scorer chose to score solely by interval instead of pitch, regardless of the types of errors present in the solutions. Another scored by pitch with extra points "added back" for correct contour. Roughly half the respondents gave no credit for any pitch spelled as an enharmonic equivalent to a given pitch. For the two non-tonal melodies, there was a fairly even mixture of preferences for scoring by interval and scoring by pitch.

Despite the small pool of respondents, general scoring preferences lean toward scoring "by pitch" for the four tonal melodies, with or without credit for transposed segments. There was not a strong preference toward scoring by pitch or by interval for the two melodies with atonal characteristics, which suggests that there may be considerable difference of opinion on scoring methods for such melodies.

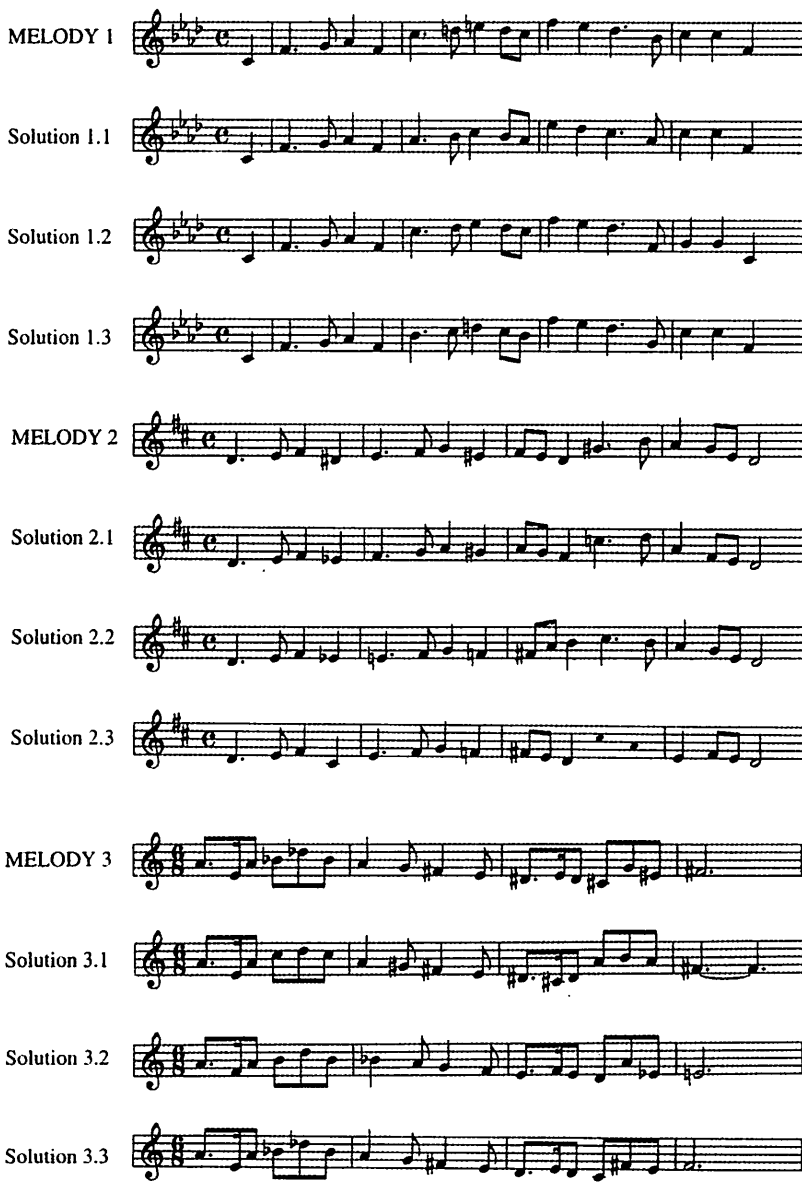
SURVEY II

Methodology

The more controlled Survey II featured three of the test melodies from Survey I (one diatonic, one tonal-chromatic, and one non-tonal), and each melody was paired with three different sample dictation solutions containing pitch errors. Unlike Survey I, in which dictation errors were designed by the researcher, Survey II featured dictation solutions selected from an exam administered to 51 students enrolled in the final semester of aural skills at Butler University. The solutions chosen for Survey II represent a variety of some of the most common errors from the student exam (see Example 1). As in Survey I,

[2]A "transposed segment" may be defined as a segment of the melody, generally three or more pitches in length, that maintains correct consecutive intervals but is "off-track" because of an earlier intervallic error. Thus, that portion of the melody is "transposed" to a different pitch level.

Example 1: The three dictation test melodies of Survey II, each paired with its three solutions.



rhythm was not included as a variable in solutions. Unlike Survey I, some errors in contour were included (see Solutions 2.2, 2.3, and 3.1 from Example 1).

Survey II was distributed to a broad sampling of college and university theory instructors from both large and small institutions across the United States. Of the 41 instructors who responded, 22% were professors, 29.3% associate professors, 19.5% assistant professors, 9.8% lecturers, and 19.5% "other" (primarily graduate students). Years' experience teaching music theory was distributed as follows: 1-5 years = 17.1%, 6-10 years = 24.4%, 11-15 years = 14.6%, 16-20 years = 17.1%, 21-25 years = 9.8%, 26-30 years = 7.3%, and more than 30 years = 9.8%. Years' experience teaching aural skills was distributed as follows: 1-5 years = 26.8%, 6-10 years = 17.1%, 11-15 years = 19.5%, 16-20 years = 22.0%, 21-25 years = 4.9%, 26-30 years = 2.4%, and more than 30 years = 7.3%. Those with experience teaching advanced-level aural skills (specifically post-second-year college undergraduate level or advanced graduate level) represented 37% of the subject pool. Each participant was also asked if his or her institution utilized any standardized scoring methodology for melodic dictation. Surprisingly, only 17.1% of the participants reported that their institution followed any sort of standardized methodology.

The 41 respondents were asked to rank five specific scoring methods, according to their preferences, for each of the sample solutions provided in the survey. The five scoring methods to be ranked were scoring by:

1) interval,
2) pitch,
3) pitch with transposition credit,
4) interval or pitch (choosing the method or combination of methods that causes the least point reduction),
5) interval and pitch (combining all errors of pitch and interval and dividing by two).

All five of these methods were among those chosen by participants in Survey I, and they were selected for Survey II either for their popularity in Survey I or simply to provide more variety among the methods in Survey II. Optional scoring methods were also available

to be ranked, at the respondents' discretion. The optional methods included opportunities to subtract points for such errors as missed structural scale degrees (such as tonic or dominant occurring on downbeats), incorrect contour, enharmonic spelling errors, or loss of tonal center. Example 2 presents the instruction page given to each participant, outlining all the scoring methods as applied to a sample melody and dictation solution. An actual scoring page for "Melody 2 – Solution 2.1" from Survey II is shown in Example 3, exactly as it would have appeared to participants as they completed their responses.

Results and Discussion

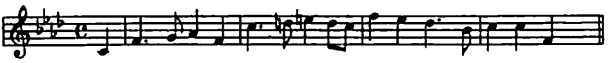
Statistical measurements of Survey II data addressed the following questions: 1) How do the five scoring methods rank according to popularity among scorers? 2) Does preference for a particular scoring method vary significantly with the style or character of the three test melodies? 3) Does preference for a particular scoring method vary significantly with the nine dictation solutions (three for each melody), or with the types of errors contained within those solutions? 4) Does each subject (each scorer) exhibit significant variation in scoring preferences?

Example 4 lists the means and standard deviations for the three melodies and their five scoring methods. The means alone indicate that two scoring methods, "pitch" (scoring method "B") and "pitch with transposition credit" (scoring method "C"), are the most consistently popular, compared to the other three methods. Also, as the melodies become more chromatic (and perhaps more "tonally ambiguous"), the means for the "interval" method increase, while the means for the "pitch" method decrease. Results indicate that for one of the scoring methods, the "interval or pitch" method (scoring method "D"), there is a statistically significant degree of variance across the three test melodies. With "interval or pitch," its mean ranking is significantly lower for Melody 1 than for Melody 2, and significantly lower for Melody 1 than for Melody 3. It may be recalled that with the "interval or pitch" method, the evaluator selects whichever method, or combination of methods, produces the

Example 2: SURVEY II - Instructions and Sample of Scoring Method

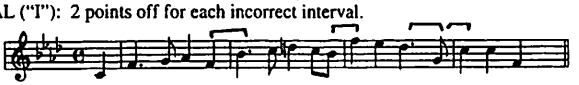
For this survey, you are asked to rank several scoring methods as applied to melodic dictation solutions for a given melody. There are three different dictation melodies, each with three different solutions. For your convenience, the scoring has already been done. Your task is simply to rank the appropriateness of each scoring method as applied to each solution.

For each solution, as many as seven different scoring methods may be ranked. Below is a sample melody, followed by the seven scoring options used in this survey, with clear illustrations of each scoring method. (The sample is Melody 1/Solution 3 from the actual survey.) **Since space does not permit detailed illustrations of each scoring method within the actual survey, it is important to study this page carefully before proceeding on to the survey!** Also, it should be mentioned here that RHYTHM IS NOT INCLUDED AS A VARIABLE in this study, for purposes of simplicity. Consequently, points are not allotted for rhythm!

SAMPLE TEST MELODY: 

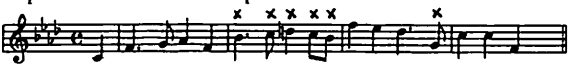
SCORING METHODS (out of a total of 32 possible points):

a) INTERVAL ("I"): 2 points off for each incorrect interval.



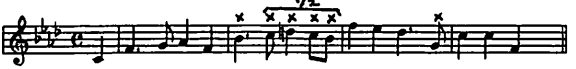
-8 = 24

b) PITCH ("P"): 2 points off for each incorrect pitch.



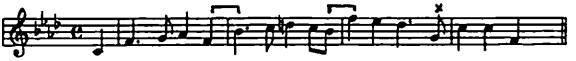
-12 = 20

c) PITCH with TRANSPOSITION CREDIT ("PwT"): 2 points off for each incorrect pitch. Then add back one point per pitch if part of a transposed unit of at least 2 consecutive pitches.



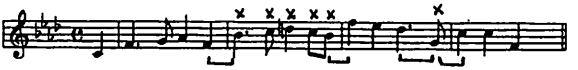
-8 = 24

d) INTERVAL or PITCH ("IorP"): 2 points off for incorrect intervals or pitches. Error types are selected according to whichever method, or combination of methods, arrives at the highest overall score. The score can be based on an all-interval approach, an all-pitch approach, or combination of both.



-6 = 26

e) INTERVAL and PITCH ("I&P"): 1 point off for each incorrect interval, and one point off for each incorrect pitch.



-10 = 22

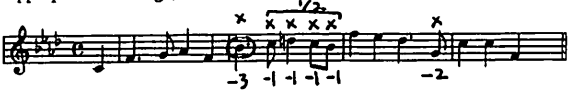
OPTIONAL SCORING METHODS (complete these as needed):

f) One of the above 5 methods (circle one: I P (PwT) IorP I&P), with additional points off for (check all that apply):

___ incorrect contour ___✓___ missed structural scale degrees, such as tonic and dominant

___ losing tonic ___ other (specify):_____

Add appropriate markings, and indicate numerical score:

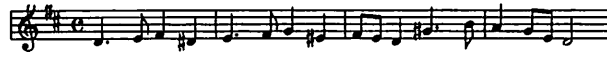


SCORE = -9=23

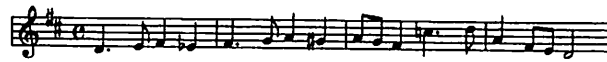
g) OTHER METHOD – Describe the method, and mark the notated example accordingly:
(no other method is presented here for this sample)

Example 3: Sample scoring page from Survey II, to be completed by respondents.

CORRECT MELODY 2



SOLUTION 2.1



SCALE FOR RANKING the Scoring Methods Listed:
1= Strongly Disagree 2=Disagree 3= Neutral 4=Agree 5=Strongly Agree

SCORING METHODS FOR SOLUTION 2.1:

a) INTERVAL:
6 incorrect intervals / -12 = 20 points 1 2 3 4 5

b) PITCH:
11 incorrect pitches (enharmonic spelling ok) / -22 = 10 points 1 2 3 4 5

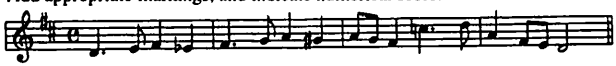
c) PITCH WITH TRANSPOSITION CREDIT:
10 incorrect pitches with one transposed segment / -16 = 16 1 2 3 4 5

d) INTERVAL OR PITCH (choose method with least point reduction):
3 interval errors and 1 pitch (F# in m.4) / -8 = 24 1 2 3 4 5

e) INTERVAL AND PITCH:
Combine all interval and pitch errors, at 1 point each / -17 = 15 1 2 3 4 5

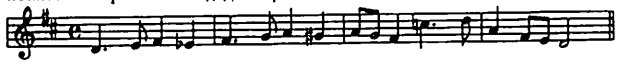
OPTIONAL SCORING METHODS FOR SOLUTION 2.1 (complete these as needed):

f) ONE OF THE ABOVE 5 METHODS (circle one: I P PwT IorP I&P),
WITH ADDITIONAL POINTS OFF FOR (check all that apply): 1 2 3 4 5
___enharmonic spelling errors ___missed tonic or dominant
___missed step-progression downbeats of m.2 and m.3 ___other (specify):_____
Add appropriate markings, and indicate numerical score:



SCORE =_____

g) OTHER METHOD NOT LISTED - Describe the method, and mark the notated example accordingly, and provide a numerical score: 1 2 3 4 5



SCORE =_____

lowest point reduction for that solution. In other words, it is a flexible scoring method that is not based upon the style of the melody, but on the types of errors found in the solution. The significantly lower mean score for this method with Melody 1 suggests that instructors would not likely be so flexible with scoring method for such a strongly diatonic melody, and would instead select a method that would weigh pitch errors more heavily than interval errors, because of the tonal strength of the melody itself.

In addressing the consistency of scorers in their ratings across the three melodies, a correlation analysis reveals that scorers are

consistent with two scoring methods, "pitch with transposition credit" (method "C") and "interval and pitch" (method "E"), across all melodies and solutions. For the other three methods, there is a strong correlation between scoring of Melodies 1 and 2, but less so between Melodies 1 and 3, or between Melodies 2 and 3. These results suggest that instructors favor methods incorporating some degree of compromise between scoring by pitch and scoring by interval, with a tendency to weigh scoring by pitch a bit more heavily. This remains consistent for diatonic melodies, even those with some degree of chromaticism included (Melodies 1 and 2 from this test). Instructors who do change their scoring methodology are most likely to do so when evaluating a melody that could be considered non-tonal (Melody 3 from this test).

The results discussed from Example 4 and from the correlation analysis also suggest that scoring by "pitch" and "pitch with trans-

Example 4: Means and standard deviations fo all five scoring methods for te three test melodies from Survey I. Scoring Methods: A = Interval, B = Pitch, C = Pitch with Transposition Credit, D = Interval or Pitch, E = Interval and Pitch. N = 41.

Melody	Scoring Method	Mean	Std. Dev.
1	A	2.40	1.18
	B	3.21	1.38
	C	3.50	1.14
	D	2.11	0.91
	E	2.75	1.17
2	A	2.50	1.15
	B	3.14	1.34
	C	3.44	0.83
	D	2.62	0.84
	E	2.56	0.93
3	A	2.85	1.11
	B	2.98	1.16
	C	3.33	0.98
	D	2.60	1.00
	E	2.74	1.21

position credit" are the preferred methods overall. The popularity of these two methods reflects a desire by many of the instructors surveyed to choose scoring methods that reinforce "tonal" listening strategies (hearing and processing "in a key") when the melody itself is considered tonal. However, as was stated earlier, there was noticeable shift to scoring by "interval" for the tonally ambiguous (non-tonal) melody. (It should be mentioned that test results reveal wide minimum and maximum ranking preferences across the sample, which indicates that the test itself was sensitive in picking up differences.)

T-tests were calculated to check for differences in ranking preferences based upon: years' experience in teaching theory, years' experience in teaching aural skills, and aural skills teaching level. Of those three categories, "aural skills teaching level" produced results that might warrant further study. The 41 subjects were divided into the more advanced teaching level (N=15) and the less advanced teaching level (N=26). The more advanced level included post-second-year college undergraduate level, plus graduate-level advanced aural skills. The less advanced teaching level included pre-college level, the basic two-year theory sequence, and graduate-level aural skills review. The two groups exhibited considerable differences regarding the "interval or pitch" scoring method for all three melodies. For that method, the more advanced instructors produced quite lower mean rankings than the less advanced. The same holds true with the "interval" method, but only for Melodies 1 and 2. This lack of enthusiasm for the "interval or pitch" method, plus the low degree of interest in the "interval" method for Melodies 1 and 2, suggests that more experienced aural skills instructors believe more strongly in a "pitch" (or "tonal") approach to listening and evaluating tonal melodies than do less experienced instructors. Further study to compare these two groups could prove fruitful.

Example 5 presents mean rankings of the five scoring methods for all nine dictation solutions (three solutions for each of the three test melodies). Two scoring methods, "pitch" (method "B") and "pitch with transposition credit" (method "C"), received consistently high means for nearly all of the nine solutions. The other three methods (interval, interval or pitch, interval and pitch) received consistently lower means in most cases. This further reinforces the

Example 5: Means of the rankings of scoring methods for all nine dictation solutions from Survey II. Variable 1.1A refers to "Scoring Methods A for Melody 1/Solution 1,"variable 1.2B refers to "Scoring Method B for Melody 1/Solution 2," etc.; Scoring Method: A = Interval, B = Pitch, C = Pitch with transposition, D = Interval or Pitch, E = Interval and Pitch; "Rank" indicates the five rankings from the Survey: 1 = Strongly Disagree, 2 = Disagree, 3 = Neutral, 4 = Agree, 5 = Strongly Agree; N = the entire subject pool of 41 participants. Standard deviations are not shown here, but all are between 0.91 and 1.47.

	MELODY 1		MELODY 2		MELODY 3	
	Variable	Mean	Variable	Mean	Variable	Mean
SOLUTION 1	1.1A	2.34	2.1A	2.49	3.1A	2.56
	1.1B	3.15	2.1B	2.93	3.1B	3.46
	1.1C	3.63	2.1C	3.46	3.1C	3.32
	1.1D	2.12	2.1D	2.05	3.1D	2.63
	1.1E	2.80	2.1E	2.80	3.1E	2.73
SOLUTION 2	1.2A	2.39	2.2A	2.49	3.2A	2.95
	1.2B	3.29	2.2B	3.15	3.2B	2.44
	1.2C	3.41	2.2C	3.51	3.2C	3.22
	1.2D	2.02	2.2D	3.29	3.2D	2.46
	1.2E	2.68	2.2E	2.24	3.2E	2.63
SOLUTION 3	1.3A	2.46	2.3A	2.51	3.3A	3.05
	1.3B	3.20	2.3B	3.34	3.3B	3.05
	1.3C	3.44	2.3C	3.34	3.3C	3.44
	1.3D	2.20	2.3D	2.51	3.3D	2.68
	1.3E	2.76	2.3E	2.63	3.3E	2.85

popularity of both the "pitch" and "pitch with transposition credit" methods.

Regarding consistency of rankings of the five scoring methods for individual scorers across all nine dictation solutions, data indicate that approximately one-half of the 41 participants remained very consistent with rankings. Those particular participants received low standard deviation measurements for most, if not all, of their rankings for the five scoring methods. In fact, three of the "consistent" participants did not vary their rankings at all for four of the five scoring methods (standard deviation = zero), regardless of the style of the test melody or the types of errors found in the solutions. Only two participants earned what could be considered high standard de-

viation measurements (indicating a great degree of variance), and in both cases, the high value was found in relation to only one scoring method. When each of the five scoring methods is viewed according to the degree of variance among rankings by the 41 subjects, it is clear that the greatest consistency is found with three scoring methods: "interval," "pitch," and "interval and pitch." Considerably less consistent are the rankings for the "pitch with transposition credit" and "interval or pitch" scoring methods. The fact that rankings for "pitch with transposition credit," one of the most popular methods, are less consistent, may be related to the types of errors included in the solutions. Some solutions contained errors that were transposed segments of the given melody, while other solutions did not contain transposed segments. Thus, the ranking for that method tended to vary according to the types of errors present in the solutions. The same might be said for the "interval or pitch" method, since that method is also quite connected to the types of errors found in each solution.

In addition to the statistical results, some observations should be made regarding other aspects of the survey data. As mentioned earlier, scorers not only ranked the five main scoring methods, but they had the option of preferring one of the five methods while subtracting additional points for errors in contour, structural pitches, enharmonic spelling, and other error types. These extra options allowed scorers to be more detailed with scoring, in order to account for specific types of errors found in the solutions (see "Optional Scoring Methods" in Example 2). Nearly two-thirds of the respondents (25 out of 41) chose to utilize these optional scoring methods for one or more of the solutions. Several of those scorers went into great detail with their scoring, adding hand-written commentary in the margin, sometimes modifying their decisions, other times expressing uncertainty about how to approach a particular error. At the other extreme, some scorers chose simplicity of method over complexity, perhaps for reasons of practicality or ease of scoring. The extreme in simplicity is best represented by the scorer who chose one simple scoring method for the entire survey, without varying the method for any of the test melodies or solutions, and without making any additional comments on the answer sheets. In sum, there was an interesting mix of preferences, within a spectrum of methods ranging

from very simple to quite complex. These preferences may reflect one's own personal style of communication, or they may be necessitated by one's own teaching situation. A teacher who has many students and limited time for grading, or who supervises several teaching assistants who do their own grading, may opt for a less complex methodology that could be accomplished more quickly and with greater uniformity.

CONCLUSION

What do these results show, and how can they be applied to the aural skills classroom? The data reveal both general tendencies as well as striking individual preferences in scoring approach. While some scorers worked with painstaking detail, arriving at quite complex scoring systems, a few of those same scorers also acknowledged the impracticality of such complex methods when faced with grading multiple papers or when having to supervise several instructors. In the actual classroom, then, some instructors may end up sacrificing detail out of necessity.

Of the 41 participants in Survey II, only seven reported that their institution follows any standardized guidelines for scoring melodic dictation exercises. Of those seven, one uses standardized scoring only in the freshman year. Possibly the lack of standardized guidelines for so many of the represented schools stems from the difficulty in arriving at a foolproof scoring method. With schools that have multiple aural skills sections taught by several instructors, perhaps it would be beneficial to work toward a common scoring methodology that is not too complex and time-consuming, yet incorporates sound pedagogical principles according to the characteristics of the melodies being tested. More in-depth exploration of how institutions deal with scoring methodologies, how and why such decisions are made, and how successful their system works, would make for an interesting study.

In my first few years of teaching aural skills, I chose to utilize a scoring methodology that gave students the highest possible score on any given dictation solution. My method, then, was the same as the "interval or pitch" method used in Survey II of the present study. I

was quite sympathetic towards students and wanted to give them as much help as possible in conquering a very difficult task. Since the "interval or pitch" method is governed by "high score potential" and has nothing to do with preferred listening strategies, I soon became dissatisfied with it as a pedagogical tool. To illustrate, suppose a student notates a solution for a clearly tonal melody and makes a single interval error very early in the melody. All subsequent intervals are maintained, which means that the rest of the melody is "off-track" because of that single error. Even though all the remaining pitches are incorrect and the tonal center is completely lost, my sympathetic scoring method would give that student a quite positive score of only a single error. Such a score would communicate falsely to the student that his or her listening skills are in good shape, when in fact, the student needs to seriously evaluate the significance of the error and re-examine what the best strategies are for listening to tonal melodies. At the very least, I would need to add commentary with the score, so that the student would clearly know that the error was a serious one.

In recent years, I have progressed to scoring by pitch for tonal melodies, with half credit back for transposed segments of three or more consecutive pitches. In comparison with my previous method, this method reinforces hearing "in a key," but does compromise a bit by giving a slight reward for transposed segments. For atonal melodies or melodies with no clear tonal center, such as Melody 3 from Survey II, I employ the "interval or pitch" method, which basically gives credit wherever possible. I am hesitant to score atonal melodies solely by interval, because I presume that students may utilize a combination of listening strategies for such melodies, perhaps juggling intervallic listening with tonal listening in various combinations. The "interval or pitch" method seems to be a neutral method to correspond to students' expected listening strategies for such melodies.

At Butler University, I supervise the aural skills program, which includes three or four theory faculty members (including myself) and two teaching assistants who are graduate students in theory/composition. We teach approximately six freshman sections and six sophomore sections of aural skills, and each section contains around twelve students. I construct all lesson plans and exams, and

we all utilize the same scoring methodologies for melodic dictation. The standardized scoring method works well for our institution, particularly as an aid for the teaching assistants, who typically have no prior classroom teaching experience. Students are made aware of the scoring methodologies we use, and on occasion they mark their own work in class, so that we can discuss connections between scoring and hearing. One specific activity I now include at the sophomore level is something similar to Survey II. Students are actually provided with melodies of varying styles and asked to assign a scoring methodology that would be reflective of how they would hear and process that melody. We then collect all the responses and discuss the results.

I believe very strongly that the scoring methods should correlate as closely as possible with the listening strategies advocated in the classroom. I will be honest in that regard and say that I am still not satisfied with my scoring methods or how I communicate results to students. I often find myself in a hurry just to get exams graded and returned, with little time to write many comments on students' papers. My current goal is to further refine how I score solutions, based in part on the results from the present surveys. For example, if a tonal melody has a sequential passage with a clear step progression in effect on downbeats, then I would like for the downbeat pitches to carry more weight in the scoring process. If I refine my scoring methods, however, I must also refine my teaching methods, making sure to emphasize the importance (and the advantage) of hearing such structurally significant pitches within the context of a melody.

Despite the need for scoring methods that are time-efficient and relatively simple, we must not overlook the need for methods to reflect how we wish the students to hear and process melodies. If we encourage different listening and processing strategies for a tonal melody than for an atonal melody, then shouldn't our scoring of such melodies reflect those differences as well? If we stress the importance of structural scale degrees and step-progressions within a tonal melody, then shouldn't our scoring method reflect such important components? If we encourage students to utilize all their listening skills to understand a melody, then perhaps we should evaluate using a combination of approaches (interval and pitch, for

example). The difficulty lies in the fact that despite our teaching approaches, we have no sure method of determining exactly how a student will actually listen and process a melody when completing a dictation exercise.

Perhaps there is a middle ground for which we can strive, one which maintains some degree of simplicity but which also allows for some detailed error assessment according to the structure of the melody and the types of errors found. To affirm the views of Karpinsky (2000), quoted at the beginning of this article, it is also crucial that we take time to provide feedback that can prove beneficial to the listener's development of aural skills. If indeed the task of melodic dictation is an important and multi-faceted learning tool, then we certainly should strive to make the best use of it in the classroom.

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Rethinking the Teaching of Minor Scales and Keys

Paula J. Telesco

Introduction

In a recent issue of the *Journal of Music Theory Pedagogy*, Timothy Smith reviewed Earl Henry's *Sight Singing* book and took the occasion to briefly discuss his own vexation with the so-called *three forms of minor*.[1] He succinctly summed up his solution: "Inform students that all dominant functions in minor are: (a) borrowed from the parallel major, (b) signaled by the appearance of "*ti*" which is (c) often approached from a borrowed "*la*," and leave well enough alone."[2] I would like to pick up where Smith left off and further explore the problems inherent in this "three forms" approach, expand the discussion to include the corollary topic of the equally flawed method of teaching minor scales and keys through their relative majors, and conclude by proposing a different approach, illustrated by a model textbook unit.

There is no disputing that minor is more complicated than major. The question is, how does one account for the variables in the most efficient yet comprehensive way. I maintain that the traditional way of teaching three separate forms of minor, and the relative key approach, are neither. In this paper I am arguing for (1) teaching minor scales as a single composite scale form (more or less derived from the Aeolian mode) that incorporates two sixth

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[1]Timothy A. Smith, "Review: *Sight Singing*," *Journal of Music Theory Pedagogy* 11 (1997): 99–105. Smith was reviewing Earl Henry's *Sight Singing* (Upper Saddle River, New Jersey: Prentice Hall, 1997).

[2]Smith, *Review*, 104–105.

and seventh scale degrees, and (2) emphasizing to a much greater degree the relationship between parallel major and minor keys, and conversely de-emphasizing the relationship between relative major and minor keys, especially with respect to learning key signatures. Following a brief examination and critique of several widely used music-theory and aural-skills texts, I present a model that exemplifies the approach I am advocating. This is not meant to be an exhaustive review of undergraduate texts, nor an attempt to single out these texts alone for criticism, but rather an endeavor to determine how the subject is typically dealt with and how it might be improved. I suspect the textbook authors themselves may be somewhat conflicted and not entirely pleased with their presentations, but feel bound by tradition and marketability to keep it fairly standard.[3] This survey demonstrates that almost all the presentations are to some degree contradictory, trying to incorporate a sophisticated account of the generation and role of the two sixth and seventh scale degrees, while at the same time falling back on the three-forms approach.

Problems of the three-forms and relative-key approach

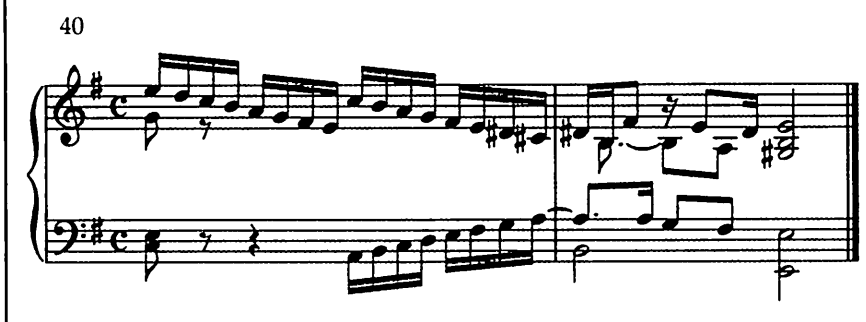
For far too long, as I have taught second through fourth semester theory and aural skills (and even graduate level theory), I have repeatedly confronted the problems and persistent confusion that are the direct result of the students' overall lack of any true understanding of minor scales and keys, all traceable to their having been taught the traditional and hidebound three forms of minor and relative-key approach. This deficit manifests itself in numerous ways. For instance, many students view minor-key music as having three distinct configurations, believing a composition or passage is written in one specific form of minor. They also believe that if a melodic passage is ascending, the melodic form of the scale *must* be used, and if descending, the natural form is called for, and they are perplexed if they encounter anything else. These students do not understand the comprehensive integrity of minor—that minor is an aggregate

[3]Timothy Smith discusses this same concern in his review with respect to solmization systems (p. 103).

with two variable scale degrees, and that a minor-key composition may use any of the notes or chords available in the key. While it is true that ascending passages often use the raised sixth and seventh scale degrees, and descending passages use the lowered ones, the determining factors are a combination of the prevailing harmony and concomitant melodic tendencies. For example, in Prelude 10 from Bach's WTC, Book I (shown in Example 1), the bassline ascends with the lowered sixth and seventh degrees, while the soprano descends with the raised ones, in order to project subdominant and dominant harmonies on beats 3 and 4 of m. 40.[4]

Other shortcomings of this traditional method include the added difficulty of trying to learn three different scale forms for each key (with a different set of pitches for each), followed by what seems to be a bewildering array of chord choices. Most students try to compartmentalize: melodies or chords that fit in natural minor, those that fit in harmonic minor, those that fit in melodic minor. Furthermore, many, if not most, textbooks are complicit in this, showing melodic excerpts and chord choices for each form of minor, rather than integrating them and showing all minor-key melodies and chords as belonging to a single key whose scale form includes two variable 6th and 7th degrees.

Example 1. Bach, WTC, Book I, Prelude 10



[4]This example is used in Stefan Kostka and Dorothy Payne's *Tonal Harmony*, 4th ed. (Boston: McGraw-Hill, 2000), 63.

No doubt unintentionally, these texts fail to reinforce the fundamental notion that minor scales are simply pitch inventories we construct to show ourselves the pitches available in any given key (which most texts *do* point out when discussing major scales). Scales, whether minor or major, need to be understood as a *byproduct* of musical practice, not the generator. However, textbooks tend to overemphasize minor scale forms as distinct entities (as do many instructors), rather than showing them as tools used in the service of the keys themselves, resulting in students understanding them as the determining factor in melodies and harmonies, rather than the reverse. We then must try to untangle the students' misperceptions when they see music that does something contrary to what they believe it should (in their minds, breaking the "rules").

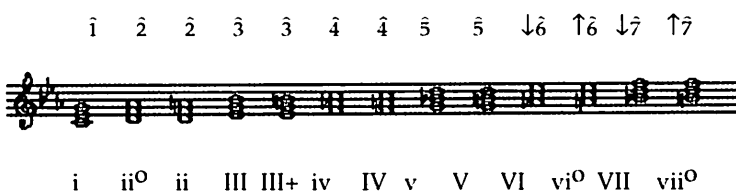
The reliance on three scale forms suggests implicitly that we lack a better explanation for the appearance of two variable scale degrees—that we believe composers saw these scale forms as inviolable musical truths and composed accordingly, yet impishly broke these rules more often than we like to admit, as evidenced by the amount of music that does not adhere to these sacred precepts. Students *do* need to be able to spell minor scales in order to familiarize themselves with the pitches available in the various minor keys, but I propose that minor scales be taught as composite scales (as shown in Example 2), a method already adopted by some textbook authors. Traditional scale forms should be understood as an older way of showing the alternate scale degrees—something that is most useful for practicing patterns on an instrument (as pointed out by some authors), but not particularly instructive. Beyond that, do we really need separate scale forms to provide a leading tone, or to illustrate a common melodic pattern? How much easier to show all the notes together as a single composite scale.

This approach also has the advantage of laying a more secure foundation for teaching diatonic chords in keys. By building two triads on every scale degree but tonic (the only triad that does not contain scale degree $\hat{6}$ or $\hat{7}$) we can effectively and efficiently demonstrate how each diatonic triad has two alternate versions (as shown in Example 3).[5] This contrasts markedly with the method

[5] The diatonic seventh chords would include two triads on scale degrees $\hat{1}$-$\hat{6}$ but four on $\hat{7}$, since a vii^{o7} or a VII^{7} each contain both a 6th and a 7th degree.

Example 2. Composite Scale with Variable 6th and 7th Scale Degrees

Example 3. Diatonic chords in minor



currently used in many textbooks, which show three forms of a minor scale, and the diatonic triads for each. As noted above, students have great difficulty integrating these three scale forms, and many never do. Furthermore, if the text stresses the idea that the most commonly used chords in minor are primarily those from harmonic minor, students often come to believe the others do not actually exist, at least not in any "real" music. Unless of course, they find it in Bach, and they fall back on that old saw, "well, he was Bach, he could do whatever he wanted to do"—as though Bach were violating a major theoretical and compositional principle.

As for the relative-key approach, the most common problem is that students try to learn minor key signatures through their relative majors, rather than learning them as independent keys, or through their parallel majors. This is in large part due to the fact that if they had any music lessons before entering college theory, they likely were taught this way. Furthermore, many theory textbooks foster this approach. Nevertheless, the end result is a lack of fluency with minor keys and key signatures, and worse, minor keys are always viewed as adjuncts to their relative majors, rather than as legitimate keys in their own right, or at least modally inflected versions of their parallel major-key counterparts.[6] And students often pair the wrong keys. I have had the experience of asking a student the key signature of E♭ minor and being told it is G major. Not only is the relative major Gb rather than G major, but more importantly, the key signature is six flats, not the name of some other key.

The situation is further compounded when students must learn to spell dominants and leading-tone chords in minor, because they often confuse the leading tone and subtonic, thinking in terms of key signature only. This problem becomes even more acute in upper levels of theory, when chromatic chords such as secondary dominants, diminished sevenths, augmented sixths, Neapolitans, and borrowed chords are introduced, chords that when used in major borrow notes from their parallel minors, most often the lowered sixth scale degree. Certainly every theory teacher has experienced students repeatedly spelling a minor-key dominant triad or seventh with a minor third (the subtonic); likely, these teachers have also

[6] The keys without relative majors or minors are discussed later in this paper.

noted the bewilderment of students trying to spell an augmented sixth in major, because these students do not have a clear concept of the lowered sixth scale degree.

When students focus on the traditional pairing of *relative* major and minor keys, the concept of lowered or raised sixth and seventh scale degrees is at best confusing and at worst meaningless, because students are never sure what the notes are lowered or raised to or from. If minor scales are paired more aggressively with their *parallel* majors, then "lowered" always refers to those notes that fit in the minor key signature, and "raised" refers to those that fit in the major key signature. Further, pairing minor scales with their parallel majors clarifies the reason for using $\uparrow\hat{6}$ and $\uparrow\hat{7}$: (1) to provide the leading tone for harmonic purposes (as happens in parallel major); and (2) to provide the raised sixth, both to smooth out the potential augmented second that would result if the lowered sixth is placed next to the leading tone, and to provide stronger dominant harmonies, or dominant prolongation.[7] For example, mm. 31–32 of Bach's G minor Gavotte prolong dominant harmony via the progression $V\frac{5}{6}$ – $vi^{\varnothing 7}$–V^7 with the bassline descending F#–E♮–D against an upper voice ascending E♮–F#–G (shown in Example 4).[8] Yet another benefit of underscoring the parallel relationship is that the tonal priority of $\hat{1}$, $\hat{4}$, and $\hat{5}$ can be highlighted, since they remain the same in either mode. This provides not only a firmer foundation for future study than does the relative relationship, but also support for aural skills classes, particularly for harmonic dictation, since the scale degrees and their interconnected relationships remain the same. Focusing on parallel keys is also beneficial when teaching intervals. Most current textbooks state that all intervals above tonic in a major scale

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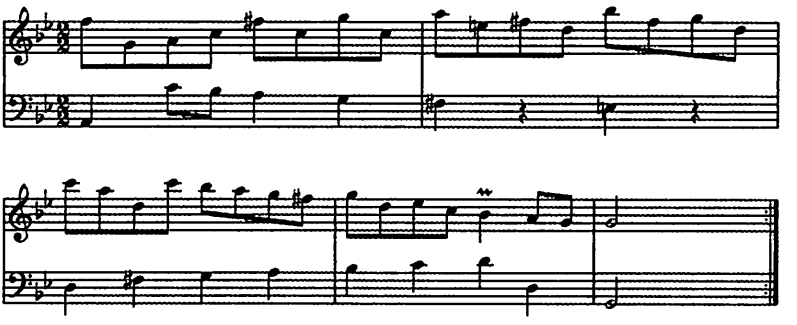
[7]I am borrowing this efficient arrow notation from Kostka and Payne's *Tonal Harmony*, 4th ed. (Boston: McGraw-Hill, 2000). Downward-pointing arrows designate the sixth and seventh scale degrees specified by the minor key signature, while upward-pointing arrows designate their major-key counterparts a chromatic half-step higher. This notation has the advantage of consistency, avoiding differing accidentals to refer to the same scale degree or chord in different keys, as for example, b6 or bVI for Ab in C minor, but ♮$\hat{6}$ or ♮VI for A in C# minor.

[8]English Suite No. 3 in G minor, BWV 808. This gavotte is readily available in various anthologies, and often included in textbooks in chapters on binary form and contrapuntal writing.

Example 4. Bach, Gavotte in G minor



are either major or perfect, so pairing parallel major and minor keys makes it is easy to see that the minor key signature will yield minor intervals on scale degrees $\hat{3}$, $\hat{6}$, and $\hat{7}$, a half-step below their major key counterparts, while $\hat{2}$, $\hat{4}$, $\hat{5}$, and $\hat{8}$ remain the same. Additionally, the minor key contains the identical major 6th and 7th degrees that the parallel major does. Surely many teachers already point this out, but by placing greater emphasis on the parallel relationship, the task becomes easier.

So why do these traditional approaches still hold sway? First, as mentioned above, if students have had any pre-college music lessons, they typically were already exposed to the three-forms and relative-key approach, and that would no doubt continue in their college-level performance studies. Second, many college-level theory instructors employ this method because that is the way they were taught. Third, no doubt in response to the first and second reasons, most theory and aural skills texts perpetuate this method, as the following survey illustrates.

Survey of Texts

Earl Henry's *Fundamentals of Music* begins by showing the half- and whole-step arrangement of a natural minor scale (without mentioning

the word natural), and follows this with what I consider to be an exemplary paragraph for a fundamentals text, since he mentions what is probably the likeliest explanation of why the three forms of the minor scale became a seemingly indelible part of common musical understanding (as alluded to above): the necessity for performers to practice the various scale-type passages they were likely to encounter when playing common-practice music:

> Whereas traditional Western composers did not regularly alter the intervals in major scales, three different forms of the minor scale are common....[which] reflect the choices made most often by traditional composers. Performers practice three different forms...to become familiar with the most typical melodic patterns. In actual composition, however, the three forms are adhered to less rigidly, and two of them may even be employed simultaneously (one form in the melody, for example, and a different one in the harmony).[9]

But having said that, Henry continues with the traditional approach, including melodic excerpts to illustrate the different forms of minor, and making it appear as though it might be unusual to find two forms of minor in the same piece: "The following melodies are constructed from a major scale or from one of the three forms of minor....One of the melodies employs two different forms of minor. Locate this melody and speculate on why the composer used the two different forms."[10] Rather than focusing on a scale form, why not ask instead why the composer chose a particular 6th or 7th scale degree and get students thinking along those lines? A few pages later he says: "In the actual music, however, harmonic and melodic forms of minor occur regularly as accidentals effect the raised sixth or seventh. Sometimes...two or more forms of minor occur in the same composition—even simultaneously."[11] Thus, this still suggests that pieces are strung together from different forms of minor. More to my liking, though, after he presents the standard approach of learning minor key signatures through their relative majors, Henry shows how to learn them through their parallel majors: subtract three sharps or

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[9]Earl Henry, *Fundamentals of Music*, 3rd ed. (Upper Saddle River, New Jersey: Prentice Hall, 1999), 219.

[10]Henry, *Fundamentals*, 227.

[11]Henry, *Fundamentals*, 231.

add three flats to the parallel key signature. Although he does not elaborate on the reason for this, it serves to reinforce the connection between parallel keys (especially if seized upon by the instructor): a minor key signature yields three notes that are a chromatic half-step lower than those of the parallel major ($\hat{3}$, $\hat{6}$, and $\hat{7}$).

Bruce Benward and Gary White, in *Music in Theory and Practice* (probably one of the most widely-used theory textbooks), start out well enough by saying that a minor scale has two versions of $\hat{6}$ and $\hat{7}$, and that traditionally, the minor scales have been described as having three distinct forms, but in practice, composers use all the scale resources of the minor scale within a single composition.[12] But then they go into the three forms of the scale, invoke the relative relationship to introduce minor, and show excerpts of pieces that they claim use the various forms of the scale, thus contradicting what their first paragraph, and reinforcing the idea that pieces are written in a specific form of minor. On the plus side, though, they pair all the major scales with their parallel minors, and efficiently show the possibility of both $\hat{6}$s and $\hat{7}$s with the use of parentheses (as shown in Example 5).[13]

In their presentation of diatonic chords in keys, Benward and White show separately the chords available in the three minor scale forms, as opposed to conflating them. But at least they do show all

Example 5. Benward's composite scale

[12]Bruce Benward and Gary White, *Music in Theory and Practice*, vol. 1, 6th ed. (Madison, WI: Brown and Benchmark, 1997), 33–39.

[13]Benward and White, *Theory and Practice*, 73.

available chords, and they do pair them with their parallel major. Less satisfying is Benward and J. Timothy Kolosick's *Ear Training* book, where in one section the instructor is given 10 melodies to play, and the students are asked to determine the scale-form basis of each melody, again reinforcing the misconception that minor key music is written exclusively in one form or the other, and never the twain shall meet.[14] Similar to what I suggested with respect to Henry's text, this could be a valuable exercise with a slight modification. Instead of asking for scale form identification, why not focus students' attention on which sixth and seventh scale degrees they are hearing and why the composer may have chosen one over the other (as, for example, the necessity of a leading tone at a cadence, or $\downarrow\hat{6}$ as an upper neighbor to $\hat{5}$)?

Like Benward and White, Ralph Turek (*Elements of Music*) follows the path of least resistance and uses the relative-key approach to introduce minor (although later he does make some important connections between parallel keys), illustrates the three forms of the minor scale, and dutifully gives a short musical excerpt that employs each form of the scale.[15] More positively, Turek makes the important point that "composers have actually approached the minor scale not as three separate structures but as different facets of a single scale."[16] He follows this with what he calls the *melodic minor principle*:

1. Scale degree seven is usually raised when progressing upward. If scale degree six precedes it, it is also raised.
2. Scale degree six is usually in its natural minor state when progressing downward. If scale degree seven precedes it, it is also in its natural minor state.[17]

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[14]Bruce Benward and J. Timothy Kolosick, *Ear Training*, 6th ed. (Boston: McGraw-Hill, 2000), Melody 2B, pp. 30–32 in the instructor manual, 20–21 in the student book.

[15]Ralph Turek, *The Elements of Music*, vol. 1, 2nd ed. (New York: McGraw-Hill, 1996), 61–64. On a related note, I find it disappointing that, unlike his section on major scales, where Turek shows every single major scale written out, he shows only five minor scales (four natural, one harmonic), hardly sufficient for the more difficult and less familiar of the two scale types.)

[16]Turek, *Elements*, 65.

[17]Turek, *Elements*, 65.

I have no objection to his principle per se, but calling it the *melodic minor principle* once more reinforces the notion that music is predicated on a particular scale form, minus any harmonic consideration, and not the reverse.

Better, from my point of view, is Turek's section on diatonic triads in minor. He places the most common triads on one staff, and the less common ones on another, labeling them "alternative forms using sixth and seventh scale degrees," and noting that these alternative forms occur far less frequently than their counterparts on the first staff. His illustration neatly displays all the available diatonic chords without invoking any particular form of minor, but disappointingly he relates this back to his so-called melodic minor principle, saying, "every triad but the tonic has a diatonic variant that can result from the alteration of the sixth or seventh scale degree in accordance with the melodic minor principle."[18] Thus, harmonic considerations are made to seem secondary to the supposed priority of a scale form.

Benjamin, Horvit, and Nelson (*Techniques and Materials of Tonal Music*) take a minimalist approach in their presentation of topics.[19] They introduce minor scales (as they did for major) as particular arrangements of whole and half steps (and an augmented second for harmonic minor), indirectly relating them, however, to the relative key—C is used to illustrate major, and A for minor. Minor key signatures are directly related to the relative major: "Each major key has a relative minor whose tonic is on the sixth scale-degree of the major (and a minor third below the tonic) and that uses the same key signature."[20] But what I like about their presentation is that they immediately introduce the idea of variable sixth and seventh scale degrees, that no excerpts are used to suggest that music is written in a particular form of minor, and that context alone determines the choice, rather than the direction of a line:

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[18]Turek, *Elements*, 124.

[19]Thomas Benjamin, Michael Horvit and Robert Nelson, *Techniques and Materials of Tonal Music*, 3rd ed. (Boston: Houghton Mifflin, 1986), 12–13.

[20]Benjamin, Horvit, Nelson, *Techniques and Materials*, 15.

> Minor scales have three traditional forms—natural (pure), harmonic, and melodic—shown here with the A-minor scale. There is rarely a clear distinction between these forms in actual music. Context alone determines which forms of the variable sixth and seventh scale-degrees will be used in a given passage.[21]

Unlike the other books surveyed, this text does not have a discrete section presenting all the diatonic triads in major and minor. Rather, successive chapters introduce individual chord functions, with major and minor keys treated simultaneously, initially without any mention of variable scale degrees or chord qualities. Those minor-key chords that are included in these chapters are the more commonly used ones, though no explanation is given for why that is. Later, in a chapter titled "Variant Qualities of Triads," the less common triads in minor are discussed. Disappointingly, they are linked to forms of the scale: "IV, ii, and vi^{o} are found with the ascending form of the scale; v is found with the descending form."[22]

Earl Henry's *Sight Singing* text (the book reviewed by Smith) contains a commendable discussion of minor, all the more so since it is a sight-singing book and not a theory book, as pointed out in the preface:

> *Sight Singing* is not a theory text...yet many theoretical subjects...are discussed briefly....Each chapter begins with a list of **Allied Theoretical Concepts** that...should be thoroughly understood *before the chapter is begun*.[23]

Henry introduces minor by explaining that, "Although we commonly study these scales as if they were three distinct choices, you will find that composers choose melodic patterns in minor that emphasize the goal of the passage."[24] He relates minor to Aeolian

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[21]Benjamin, Horvit, Nelson, *Techniques and Materials*, 12–13.

[22]Benjamin, Horvit, Nelson, *Techniques and Materials*, 98.

[23]Earl Henry, *Sight Singing* (Upper Saddle River, New Jersey: Prentice Hall, 1997), ix. Henry's two out-of-print theory books, *Music Theory* vol. 1 (New Jersey: Prentice Hall, 1985) and *Theory of Tonal Music* (New Jersey: Prentice Hall, 1985) were unavailable to me.

[24]Henry, *Sight Singing*, 96.

and pairs A major with A minor in order to demonstrate the different placement of half steps. Owing to this difference, he says, minor contains a subtonic. He explains that composers generally wanted a leading tone, especially for harmonic purposes, so they often raised it, producing what is known as Harmonic minor. In a stepwise melodic passage, this would result in an awkward augmented second, so composers often raised the sixth degree as well, thereby creating a *new* form known as Melodic minor. (Henry shows the three minor forms next to the parallel major, emphasizing the comparison of scale degrees $\hat{3}$, $\hat{6}$, and $\hat{7}$.) Consequently, these different scale forms are seen as the *byproduct* of musical practice, and not the reverse—practice has *created* new forms of the scale.

In discussing the use of the alternate sixth and seventh degree, in place of the all too common, simplistic and counterproductive explanation that when melodies ascend, the melodic minor is used, and when they descend, natural minor is used, Henry avoids any mention of scale form and focuses instead on tonal goals and harmonic considerations:

> Melodies move typically according to the goal of a given passage, as shown below. If the tonic is the goal of an ascending passage, raised $\hat{6}$ and/or $\hat{7}$ will be employed. If the dominant is the goal, however, either or both of these same pitches will probably be natural. When pitches other than the tonic and dominant are emphasized, raised or lowered $\hat{6}$ and/or $\hat{7}$ reflect the direction of the passage[25]....When the dominant triad is outlined in a melody, the raised $\hat{7}$ is nearly always employed.[26]

The treatment in Kostka and Payne's *Tonal Harmony* is close to what I am advocating in several ways. For example, chapter one introduces minor scales in relation to their parallel majors.[27] The authors show the three minor forms against their major counterpart, highlighting the comparison of scale degrees $\hat{3}$, $\hat{6}$, and $\hat{7}$ (as shown in Example 6).[28]

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[25]Henry, *Sight Singing*, 99.
[26]Henry, *Sight Singing*, 112.
[27]Kostka and Payne, *Tonal Harmony*, 13–16.
[28]Kostka and Payne, *Tonal Harmony*, 13.

Example 6. Kostka/Payne comparison of parallel scales

C Major	C	D	E	F	G	A	B	C
Scale Degree	$\hat{1}$	$\hat{2}$	$\hat{3}$	$\hat{4}$	$\hat{5}$	$\hat{6}$	$\hat{7}$	$\hat{8}$
C Natural Minor	C	D	E♭	F	G	A♭	B♭	C

Moreover, the authors do not show snippets of pieces and claim that they are written in a particular form of minor, nor do they state that when the melody ascends, the raised sixth and seventh are used, and when it descends, the lowered sixth and seventh are used, but they still do treat them as three separate scale forms. Their opening sentence on minor scales states: "Musicians traditionally memorize and practice three minor scale formations, although they are not used with equal frequency, as we shall see in a later chapter."[29] I thoroughly endorse this comment and what they say in that later chapter (Chapter 4, "Diatonic chords in Major and Minor Keys") and wonder why they did not include these comments in chapter one:

> Because instrumentalists are taught to practice natural, harmonic, and melodic minor scales, we sometimes assume that the tonal composer had three independent minor scale forms from which to choose, but this is not how the minor mode works in tonal music. We can make the following generalizations about the three minor scales: there is, in a sense, one minor scale that has two scale steps, $\hat{6}$ and $\hat{7}$, that are variable. That is, there are two versions of $\hat{6}$ and $\hat{7}$, and both versions will usually appear in a piece in the minor mode. All the notes in Example 4-1 are diatonic to e minor. [Their Example 4-1 shows a composite scale.][30]

[29]Kostka and Payne, *Tonal Harmony*, 13.
[30]Kostka and Payne, *Tonal Harmony*, 61.

How disappointing, then, for them to follow this by reverting back to invoking forms of the scale:

> How do composers decide which version of $\hat{6}$ and $\hat{7}$ to use? Melodically, the most graceful thing for $\uparrow\hat{6}$ and $\uparrow\hat{7}$ to do is to ascend by step, whereas $\downarrow\hat{6}$ and $\downarrow\hat{7}$ tend naturally to descend by step; these tendencies conform to the melodic minor scale. Example 4–2 provides a good illustration of the use of the minor scale.[31]

My reaction to their discussion of diatonic triads in minor is equally mixed. The strength of the presentation is in explaining why there are more triads in minor than major and showing all the chords on a single staff, circling those that occur most frequently (as shown in Example 7):

> Because $\hat{6}$ and $\hat{7}$ are variable, and because nearly all triads contain $\hat{6}$ or $\hat{7}$, more diatonic triads are possible in minor. Nonetheless, there are seven triads in minor (one for each scale degree) that occur more frequently than the others, and these are the ones [that] are circled.[32]

The weakness of this section is that they still relate those chords to the harmonic minor scale:

> Notice that the roots of the triads circled [in Example 7] all belong to the harmonic minor scale. In fact, all the notes of the circled triads belong to the harmonic minor scale, with the exception of the 5th of the III chord.[33]

Robert Gauldin's presentation in *Harmonic Practice in Tonal Music* is, overall, probably the closest to what I am advocating, although I think too concise for many typical university students.[34] He begins, as did Henry, by pointing out that the basic difference between major and minor is the lowered third scale degree. But he

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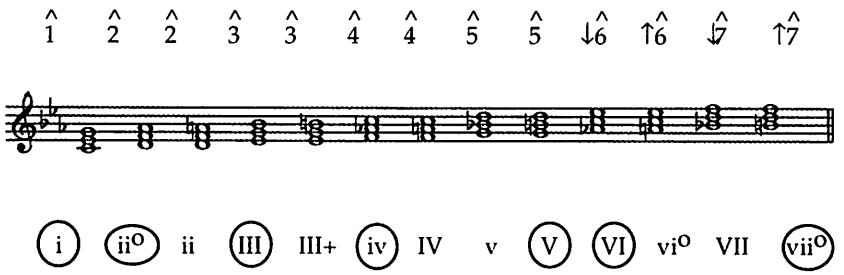
[31]Kostka and Payne, *Tonal Harmony*, 62.

[32]Kostka and Payne, *Tonal Harmony*, 64–65.

[33]Kostka and Payne, *Tonal Harmony*, 65.

[34]Robert Gauldin, *Harmonic Practice in Tonal Music* (New York: W.W. Norton, 1997), 30–31.

Example 7. Kostka/Payne diatonic chords in minor



then uses A to illustrate minor when he used C for major. That aside, he says minor is more complex than major and that "several scales are traditionally used to illustrate different aspects of the minor mode."[35]

> The **melodic minor scale**...shows how the scale degrees tend to operate in actual tonal melodies. As a melodic line rises from to $\hat{5}$ to $\hat{8}$, scale steps $\hat{6}$ and $\hat{7}$ are raised by a half step, which increases their inclination toward the upper tonic ($\hat{5}$ – ♯$\hat{6}$ – ♯$\hat{7}$– $\hat{8}$). When a melodic line descends from $\hat{8}$ to $\hat{5}$, scale steps $\hat{7}$ and $\hat{6}$ are lowered, producing a strong half-step pull from ♭$\hat{6}$ to the dominant ($\hat{8}$ – ♭$\hat{7}$– ♭$\hat{6}$ – $\hat{5}$). The lowered 7th degree is called the **subtonic** rather than the leading tone, since in this form it does not lead to the tonic....The **harmonic minor scale**...represents those scale degrees that are typically found in the most basic chordal progressions...The natural minor scale is identical to the scale of the Aeolian church mode....If we combine all three forms of the scale into one composite scale, we obtain a better picture of the wealth of musical pitches actually used in minor-mode compositions. Example 11 shows that while the scale degrees from $\hat{1}$ to $\hat{5}$ are diatonic, the span from $\hat{5}$ up to $\hat{8}$ is completely chromatic, containing both lowered and raised 6th and 7th degrees: $\hat{5}$ – ♭$\hat{6}$ – ♯$\hat{6}$ – ♭$\hat{7}$ – ♯$\hat{7}$ – $\hat{8}$.[36]

[35]Gauldin, *Harmonic Practice*, 30.
[36]Gauldin, *Harmonic Practice*, 30–31.

The strength of this presentation is that minor is approached as an aggregate, with scale forms being a *consequence* of musical practice. And the composite scale elegantly brings into focus what is actually a simple concept: two sixth and seventh scale degrees that create a chromatic span from $\hat{5}$ to $\hat{8}$ (Gauldin's scale is shown in Example 8).[37] As for diatonic chords in minor, Gauldin illustrates them in C minor, directly underneath those in C major, as shown in Example 9. He says, "In the minor mode, note the two forms of the subdominant, dominant, and subtonic triads, which make use of both the lowered and raised 6th and 7th scale degrees."[38] I only wish he would have included ii, III+, and vi^{o} for sake of completeness, as did Kostka and Payne.

Obviously, and with varying degrees of success, all of these authors (as well as others) try to address the problem of presenting minor, yet inadvertently add to the confusion by reinforcing the three-forms and relative-key approach. I wish each of the texts could expand on their better, more theoretically correct explanations (which they all have) and excise completely any notion that minor is anything but one key with two alternate scale degrees, the raised ones absorbed from major. Clearly, much of what underlies the choice of sixth and seventh scale degree is too complicated for the introduction of minor scales and keys in the first few weeks of Theory 1, but the materials should be presented and organized with this integrated long-term goal in mind, so that students do not later have to unlearn or disregard what they learned in the beginning, or worse, get through theory without ever having understood minor. A compilation of all the strengths from each of the above texts would produce a solid presentation of minor, but I would take it even a step farther. Perhaps many instructors already employ a presentation similar to what I propose below, but I would make a plea for textbook authors to consider this approach as well. (I have chosen one possible ordering, but other orderings may be used without undermining the approach.)

The unit would begin with modes in order to introduce the concept of "scale" in its larger sense, as a collection of seven diatonic

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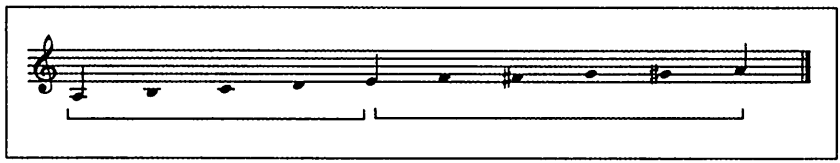
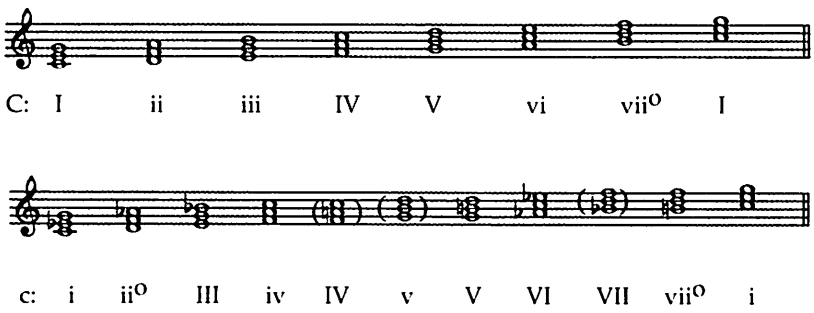
[37]Gauldin, *Harmonic Practice*, 31.

[38]Gauldin, *Harmonic Practice*, 92–93.

Example 8. Gauldin's composite scale



Example 9. Gauldin's Chords in Parallel Major and Minor



pitches (that is, seven different letter names), each with a particular arrangement of half and whole steps, and explain that there are many scale types, not just major and minor—that those are in fact a subset of the class, "diatonic scale." It would emphasize at this early stage that major and minor scales and modal scales (synonymous for our purposes) are pitch inventories that for the sake of simplicity and consistency happen to be arranged in ascending order—they could just as easily be arranged in descending order, as they were in the Greek modal system. But the point is, scales are just a convenient

tool we construct for ourselves to show the pitches belonging to a particular key or mode. After showing the different modes, and their unique placement of half and whole steps, the text would discuss how various modes, most notably Ionian and Aeolian, coalesced into the major and minor modes or keys of the common practice period, in large measure because of the desire for a leading tone at the ends of pieces, which discussion will be delayed momentarily.[39] Meanwhile, students would begin building major/Ionian and minor/Aeolian scales, concentrating on the correct placement of whole and half steps. The text would also introduce the building of scales in tetrachords, putting in place the foundation for key signatures and the circle of fifths.

This would be followed by pairing Ionian with Aeolian scales (same tonics) to demonstrate that Aeolian has a lowered or flatted $\hat{3}$, $\hat{6}$, and $\hat{7}$ with respect to Ionian, which then leads logically to the concept of parallel major and minor scales. Students would now begin spelling and notating parallel scales together to get this concept thoroughly ingrained and gain fluency in relating these scales to one another.[40] For example, one exercise might have students spell an E-major scale followed by an E-minor scale, paying close attention to which notes are lowered, followed by the reverse: spell a G-minor scale followed by a G-major scale, again noting carefully which notes are raised.

Next, the text would explain and emphasize that in minor-key music, in addition to the sixth and seventh degrees found in Aeolian minor, the raised sixth and particularly the raised seventh were so often borrowed from parallel major that they in fact became part of the minor scale and key. Thus, minor has *two* sixth and seventh scale degrees, as would be illustrated by a single composite minor scale

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[39]Actually, Dorian was the model for minor for quite a while, before Aeolian came to the fore, but in these early stages I would want to focus on Aeolian for the obvious reason that its structure is what we now refer to as natural minor. As for Dorian, Rameau, in Book Two of his *Treatise on Harmony*, advocates A minor (Aeolian) as the model but acknowledges that the scale on Re (Dorian) is more commonly used and understood.

[40] I would delay introducing the three major and three minor keys that have no parallel keys until the students are reasonably fluent spelling those that do.

paired with its parallel major, enabling students to learn all the notes of a minor key at once, without having to go through three different scale forms to ferret out a note. Students would then spell and notate composite scales paired with their parallel majors.

Now the issue of the three forms of minor would need to be addressed. The text would point out that one reason for having three scale forms was (and is) for practicing melodic passages on instruments—and for this purpose it is still valuable and necessary for instrumentalists to know. But as a means of showing all the available notes in the key, and elucidating the richness and intricacies of minor, this approach falls short and typically generates more confusion than clarification. Nevertheless, since the terms "natural," "harmonic," and "melodic" have been around for so long, we do need to know them and to know how each scale is constructed, particularly for practicing on an instrument. Here the text would stress the overriding importance of understanding that, because of this well-known instrumental exercise, we may have assumed that composers had three independent minor scale forms to work with; however, in tonal music there is but one minor scale that incorporates two 6th and 7th scale degrees. Context alone determines which of the variable degrees will be used. Melodies move according to the *goal* of a passage. Often, when a melody ascends from $\hat{5}$ to $\hat{8}$, raised $\hat{6}$ and $\hat{7}$ are used, whereas when a melody descends from $\hat{8}$ to $\hat{5}$, lowered $\hat{6}$ and $\hat{7}$ are used, but this is not an absolute, and examples to the contrary may easily be found (as in the Bach example quoted above in Example 1). Overall, $\downarrow\hat{6}$ and $\uparrow\hat{7}$ are used most often, but the others are used too, often in proximity. (After chord spelling and functional principles are introduced, this explanation would be expanded to encompass harmonic considerations, such as the need for the raised 6th and 7th scale degrees in descending passages which instance dominant harmony, as in Examples 1 and 4, and the need for the lowered 6th and 7th scale degrees in ascending passages instancing subdominant harmony, as in Example 1.) The text would further emphasize that this concept must be clearly understood, or future progress will be significantly hampered.

Key signatures would be next, with the text concentrating on the relationship of parallel keys. One class exercise might be to call on a student to give the key signature for some major key. Another

student would then be asked whether to raise or lower three notes for the parallel minor key signature, and to name the resulting key signature. In order not to make major keys a crutch (whether as relative or parallel keys), students would be drilled on minor key signatures from zero to seven accidentals. For instance, one exercise might have them recite together: "A minor no sharps, E minor one sharp, B minor two sharps," etc., and similarly for flat keys.

To teach diatonic chords, this text would do essentially as Kostka and Payne and Gauldin do: build two triads on each scale degree of a composite scale (excepting tonic) to show *all* the triads available in minor. Now, because the concept of variable scale degrees has been drilled extensively in earlier chapters, the whole topic of teaching diatonic chords in minor can be simplified by explaining that the chords used most often are those with $\downarrow\hat{6}$ and $\uparrow\hat{7}$ (with the exception of III), although all of the chords are used sometimes. Is that not more elegant than the inefficient method of creating two separate extraneous scale forms to accommodate a particular chord choice or melodic pattern?

I believe the approach I am advocating has much to recommend it and would go a long way towards providing students with a much better appreciation and understanding of minor keys as well as ease the entry into such topics as chromatic and borrowed harmonies, modulation, extended chromaticism and large-scale analysis. I hope I have been persuasive and that this paper will encourage instructors and textbook authors to rethink and revise their discussions of minor.

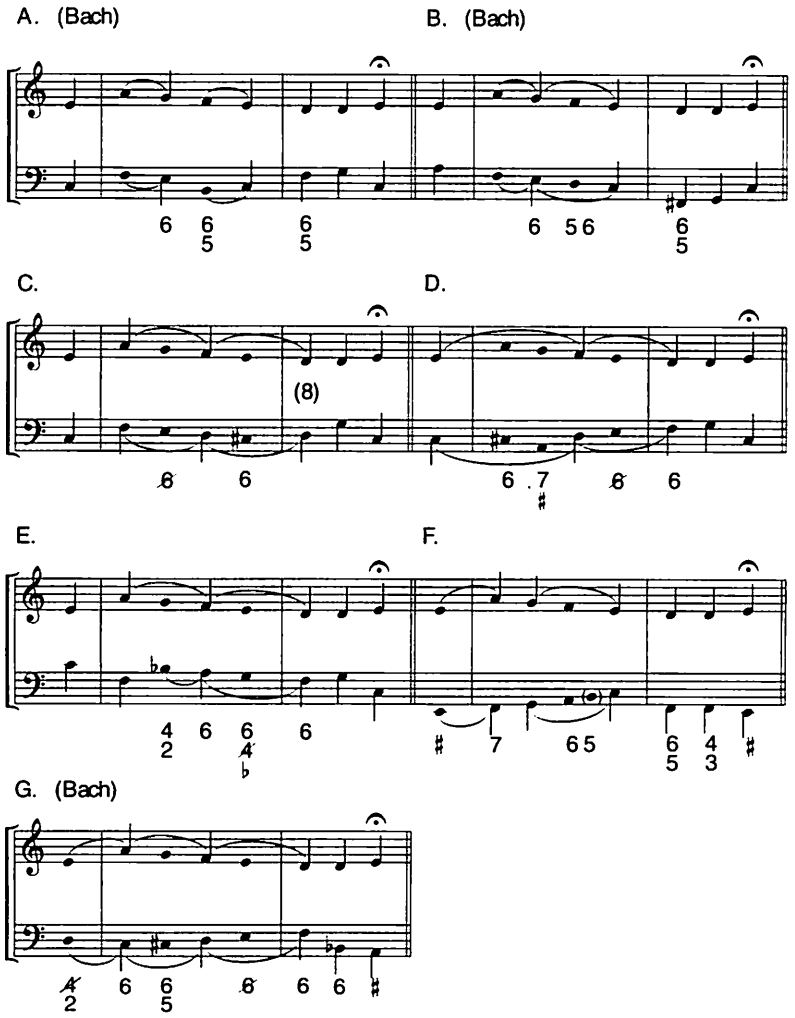
An Intersection of Counterpoint and Harmony

Robert Gauldin

I would like to begin by isolating a particular problem that has frequently arisen in my tonal or Baroque counterpoint class. Following the composition of diatonic first-species counterpoint to a given chorale cantus, I then relax the usual Fuxian restraints by permitting the occasional use of note-against-note chordal dissonance, adhering to the general soprano-bass guidelines in the chorale chapter of the Salzer-Schachter *Counterpoint in Composition*[1] and in the Bach's own settings of chorale tunes. At the same time, applied dominants are introduced to expand the harmonic vocabulary and provide either transient tonicizations within the phrase or full-fledged modulations at the cadence. Nevertheless, I find that students are frequently reluctant to abandon their former diatonic settings---settings that may limit the melodic possibilities of the counterpointing voice. They tend to overlook the technique of scale-degree reinterpretation, whereby scale steps of the original key may function as different degrees in related transient tonicizations. Nor are students always aware of latent sequential possibilities existing in the cantus part that may be realized in the other voice. The application of these procedures opens up new and different melodic vistas in the counterpointing voice that were not formerly feasible in strict diatonic settings. Some examples of these techniques, which are part and parcel of Baroque chorale harmonizations, are illustrated in Example 1. The first phrase of the cantus tune *O Haupt voll Blut* (in the upper voice) is accompanied by a note-against-note setting in the bass; figured bass symbols denote the implied harmonies. As we inject various

[1]Felix Salzer and Carl Schachter, *Counterpoint in Composition* (New York: McGraw-Hill, 1969), pp. 245-328.

Example 1: Settings of the opening phrase of *O Haupt voll Blut*

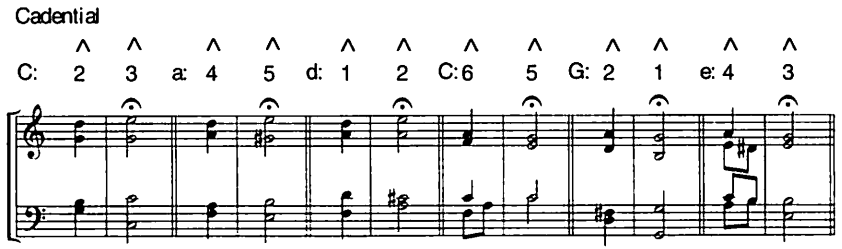


tonicizations or harmonic sequential patterns, the bass voice begins to assume radically different melodic shapes. While some of the outer-voice settings are Bach's, others are original.

This familiar chorale is a Phrygian tune. Bach usually set it in a basic center of either A minor or C major. His first two settings (Examples 1A and B) are founded in the latter. While the next two (Examples 1C and D) momentarily tonicize ii, Example 1E tonicizes both IV and ii. In Example 1F the opening and concluding Phrygian cadence suggest A minor, despite a transient movement to C. Finally, the cadence in Example 1G implies D minor!

An assignment that I have found pedagogically useful in this regard is outlined below. Given the final two diatonic notes of a melodic phrase (Example 2), students are asked to reset them as

Example 2: Assignment for different cadence tonicizations

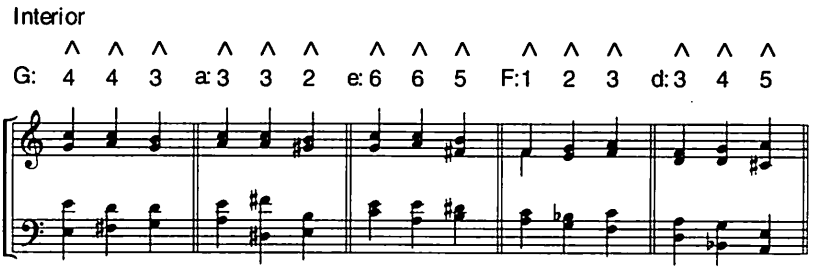


standard cadence formulas in other closely-related keys, thereby establishing different tonal destinations of the phrase.

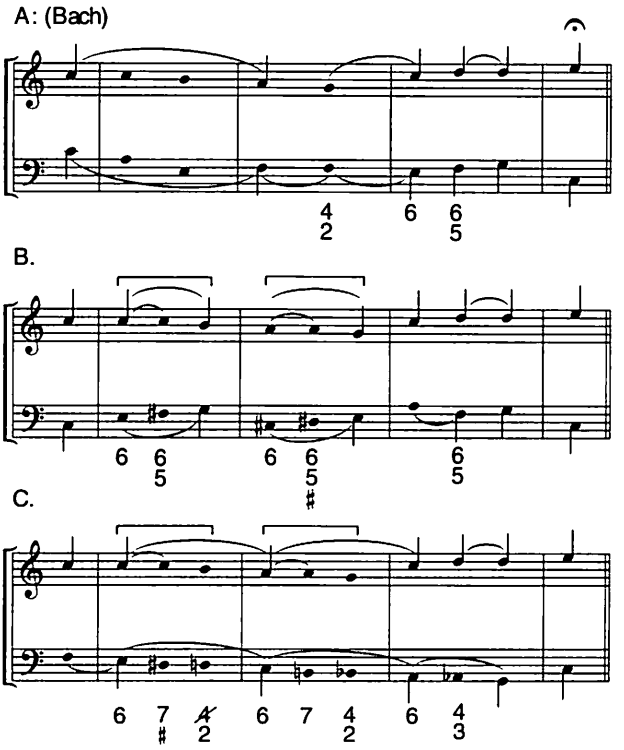
The same procedure of scale-step reinterpretation may also be applied to melodic fragments that occur within the phrase, as illustrated in Example 3. This technique is especially valuable in effecting modulations during two-voice canons at the octave, such as Bach's C-minor Two-Part Invention.

The setting in Example 4A is Bach's diatonic treatment of the opening phrase of the *Old One Hundred* (or *Herr Gott, dich loben alle wir*). The second setting (Example 4B) takes advantage of the sequential nature of the cantus ($\hat{8}$-$\hat{7}$ and $\hat{6}$-$\hat{5}$) by successively tonicizing V and iii.

Example 3: Scale-degree reinterpretation in the phrase interior



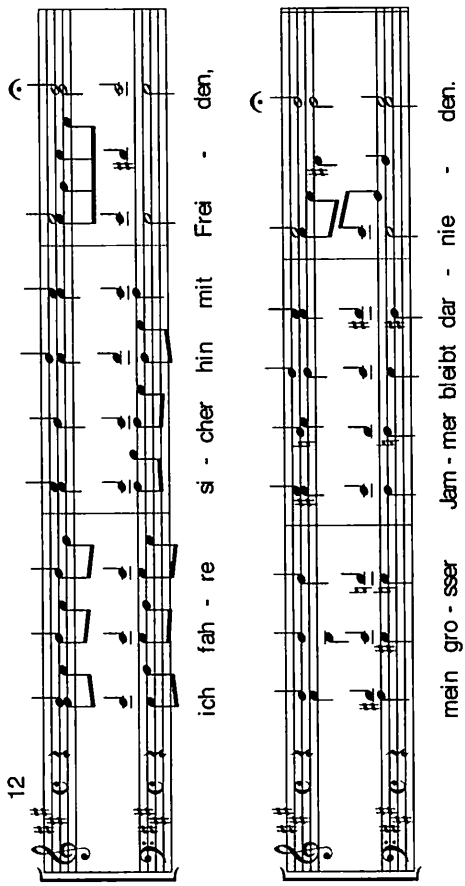
Example 4: Settings of the opening phrase of *Old One Hundred*



The final example (Example 4C) illustrates a more exotic chromatic version that tonicizes a different third motion: vi to IV.

At this point the instructor might wish to introduce the relation between the text of a chorale phrase and its appropriate harmonization. A familiar instance of Bach's sensitivity to the association of text and music is quoted in Example 5. In these two consecutive phrases from *Es ist genug!*, the melody is identical, but its settings are about as different as one could imagine.

Example 5: Comparison of Bach's setting of two consecutive phrases from *Es ist genug!*



I would be the first to admit that the above procedures do not represent anything new. Rather, the problem lies in getting students to recognize and incorporate the myriad harmonic and melodic possibilities that result from their employment. Although the next logical assignment would involve the composition of a bona fide, two-voice chorale prelude, these same principles can prove valuable in the study of free counterpoint, such as the writing of suite movements.

The techniques listed above in note-against-note contrapuntal settings have direct application to the topic of melody harmonization, a traditional and frequent assignment in most freshman/sophomore theory classes. While the majority of harmony texts routinely include such assignments, few provide the student with step-by-step guidelines that systematically outline how to harmonize melodic phrases. I would suggest the following scenario, as detailed in Figure 1. Each point is accompanied by two settings of the same tune that illustrate the successive topics under discussion.

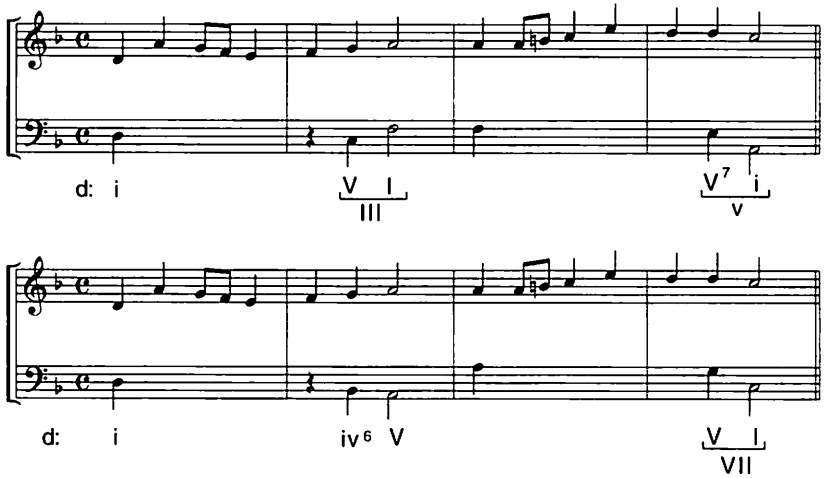
Guidelines for Melody Harmonization

1. First examine the given tune and use the opening and two closing scale degrees to determine the supporting harmonies of the initial note and cadence formula. Then sketch in their likely bass notes. (If the phrase suggests a modulation, the new key center and its cadence must be plotted in a similar manner.) This tonal framing of the phrase will normally feature root-position chords to provide the necessary tonal stability. As a result, the harmonic intervals between the two voices tend to employ a high concentration of perfect octaves and fifths. This procedure may be likened to the "telephone poles" (or stable tonal points) between which we will subsequently string "the wires" of the phrase interior (refer to Figure 1A).

2. In the middle of the phrase try to maintain a sense of functional harmonic progression while simultaneously working out a good melodic line in the bass. (It is assumed that some prior discussion has been devoted to the characteristics of "good" melodic writing

Figure 1: Guidelines for Melody Harmonization

A)



B)

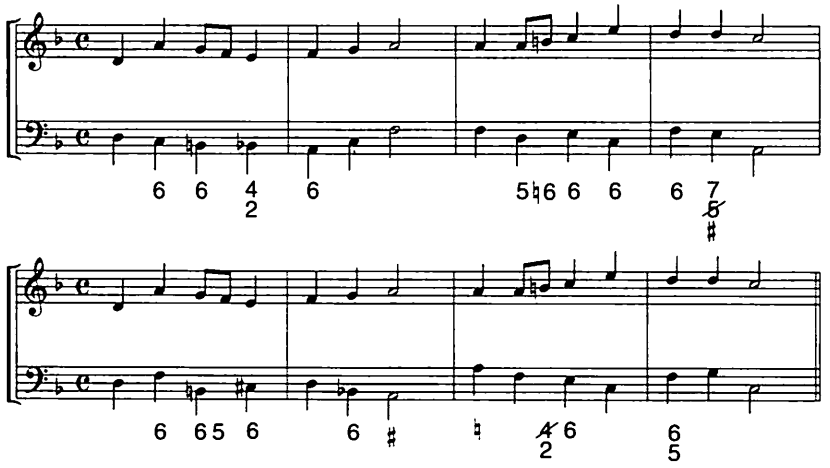
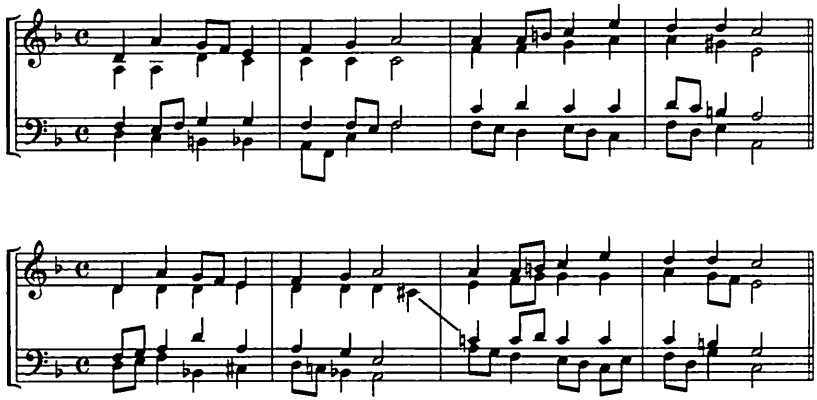


Figure 1: Guidelines for Melody Harmonization (cont.)

C)



and normative harmonic function.) Two points must be kept in mind. The melodic movement between the voices should feature a good mix of similar, contrary, and (to a less extent) oblique motion in order to maximize the individual linear characteristics of the outer parts. In addition, the intervallic relations between soprano and bass should feature the imperfect consonances (thirds and sixths), with an occasional dissonance that implies a correctly treated seventh chord. Try to avoid the use of structural perfect intervals here (especially octaves), as they tend to suggest a sense of cadential closure that conflicts with the harmonic/melodic flow typical within the phrase interior. The octave is best restricted to passing chords that occur between voice exchanges; they usually appear in weaker metric positions. The possibilities of transient tonicizations or harmonic sequences are still applicable (refer to Figure 1B).

3. Once the two-voice contrapuntal framework of the phrase is worked out, it is usually a simple matter to supply the inner voices with traditional "partwriting" procedures. Generally speaking, if the outer voices provide a good self-sufficient framework, the fill-

ing-in of the alto and tenor will proceed with minimal difficulty; the converse is often true. Appropriate melodic dissonances may be inserted to complete the setting.

Granted, the chorale tunes employed here were specifically chosen because of their inherent fast harmonic rhythm, allowing a maximum amount of information within the most compact time span. With folk-like tunes, their slower rate of chord change suggests a freer handling of texture, which could result in a simple piano accompaniment (refer to Figure 1C). Nevertheless, the underlying one-to-one contrapuntal relation between soprano and bass remains in effect.

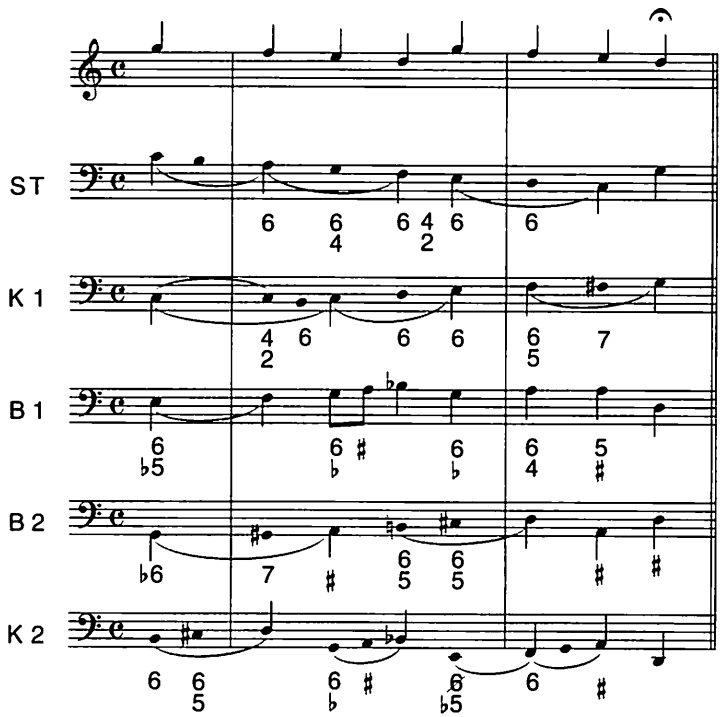
In summary, five harmonizations of the second phrase of the famous Phrygian chorale *Ach Gott, vom Himmel sieh darien* appear in Example 6. These different settings have been transposed to a common key center. The first (Example 6A) represents a completely diatonic "student" setting. In the initial treatment (K1), Kirnberger chooses to retain the C-major context but varies the approach to the half cadence (Example 6B). Bach's pair of harmonizations (Examples 6C and D) reinterpret the phrase in terms of D minor; the second of these is quite imaginative in its quasi-chromatic ascent to the root-position tonic. Finally, Kirnberger manages to work in an ingenious little passing motive (bracketed in the example) within the center of D minor (Example 6E).

The setting of a complete tune or chorale phrase entails longer-range tonal planning. The student should strive for a variety of cadential types and possible tonicizations. The pre-harmonization sketch of Ravencroft's "Bristol" hymn tune incorporates a series of cadences that outline a convincing progression of descending 5th relations: vi - ii - V - I.

In retrospect, the above discussion illustrates an interesting intersection of counterpoint and harmony. The composition of a note-against-note cantus setting and the soprano/bass duet in melody harmonizations share many features in common. Both, I feel, can profit by the use of transient tonicizations and embedded sequential patterns as a means of enlarging the scope of different melodic shapes in the counterpointing voice.

I will conclude with a few personal remarks on the question of "strict" versus "stylistic" counterpoint. The former, based originally on the principles of Fux and their subsequent deployment

Example 6: Settings of the second phrase of *Ach Gott,vom Himmel sieh darien*

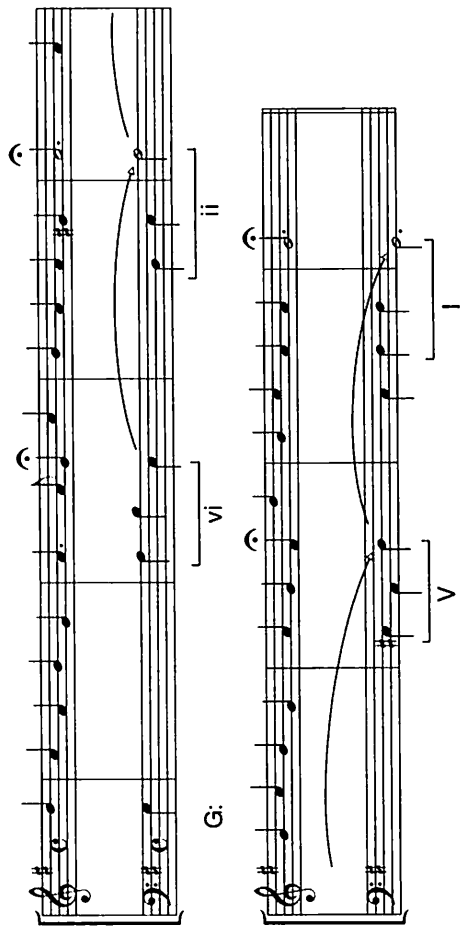


in Schenker's *Counterpoint*,[2] provides the underlying contrapuntal foundation necessary for further reductive analysis. Couched in more general terms, these principles may be applied to a variety of stylistic contexts, although Schenker's elaborative examples in Volume 1 naturally show a preference for the common-practice period. Stylistic counterpoint, on the other hand, assumes an immediate application of polyphonic techniques to a particular style system, usually the music of the Late Renaissance or Baroque. In this respect, it not only lays out the contrapuntal procedures of each era, but also provides the student with an overview of their compositional norms in general. While traditional history-survey classes on these periods

[2]Heinrich Schenker, *Counterpoint* Vol 1, translated by John Rothgeb and Jürgen Thym (New York: Schirmer Books, 1987).

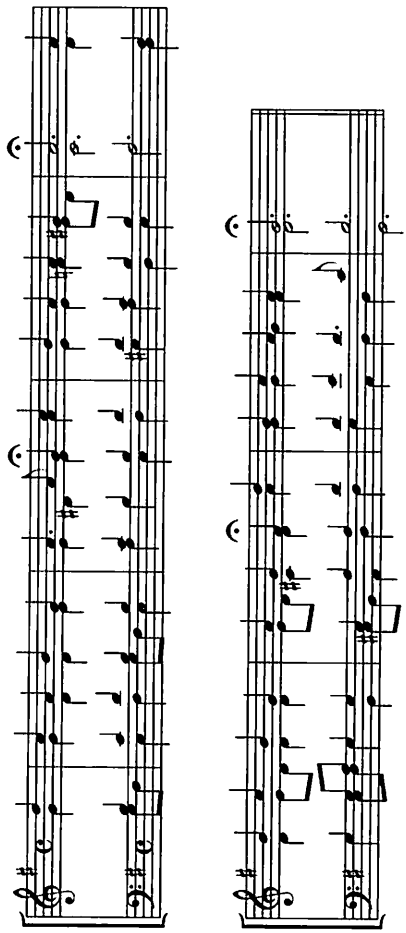
concentrate on genres, schools of composition, individual composers, and social/historical backgrounds, the skills emphasized in stylistic counterpoint courses allow the students to get their hands "dirty" by attempting to simulate the actual music. Having survived the rigors of composing an opening point of imitation based a preexistent source, they have a far greater appreciation of how paraphrase masses or vorimitation chorale preludes work. Therefore, I feel that this approach meets the more immediate needs of the students.

Example 7: Pre-harmonization sketch of "Bristol"



Example 7: continued...

Example 7: continued...



Reviews

Miguel A. Roig-Francoli, *Harmony in Context*. McGrawiHill, 2002

Reviewed by Ken Stephenson

Music theory is, if not unique, unusual among academic fields in that the methodology most freshmen learn bears little resemblance to that used by professionals in the field. The new *Harmony in Context*, by Miguel A. Roig-Francolí of the College-Conservatory of Music at the University of Cincinnati, offers an eminently successful synthesis of the traditional Rameauvian-based harmonic method and Schenkerian prolongational models in a freshman-sophomore textbook. As the author notes in the Preface, "Ignoring the pedagogical musical value of such basic Schenkerian concepts as harmonic prolongation, passing and neighbor chords, or long-range harmonic direction, leads to a vision of harmony in no way up-to-date with our understanding of musical structure and harmonic processes."[1] Roig-Francolí, however, improves upon earlier attempts to incorporate Schenkerian concepts into an undergraduate theory text by presenting the material in a format clearly accessible to the undergraduate and, even more importantly, to the inexperienced professor. Again from the Preface:

> Theory teachers who have not had extensive training in Schenker will not have any difficulty understanding or applying these concepts, even though they may not choose to stress them. Here again, I have strived to find a balance between an approach that requires full commitment to Schenker on the part of the instructor, and one that ignores the major contribution of Schenkerian theory to our understanding of tonal harmony. (p. xi)

Roig-Francolí succeeds in finding that balance. Schenkerian graphs

[1]Miguel A. Roig-Francolí, *Harmony in Context* (New York: McGraw-Hill, 2003), xi. Subsequent quotations will be cited by page number in the text.

Roig-Francolí succeeds in finding that balance. Schenkerian graphs are infrequent, and involve no more complicated notation than that shown in Example 1.[2]

As its title might suggest, *Harmony in Context* incorporates more that just Schenkerian theory into the traditional pedagogy. The book contains chapters on all the standard material for an undergraduate sequence: chord connection, using inversions, cadences, nonchord tones, secondary dominants, modulation, mode mixture, and chromatic-third relationships. In addition, though, following the path of authors such as Bruce Benward and Ralph Turek, Roig-Francolí also includes chapters on various topics including species counterpoint, history of style, hypermeter, contrapuntal genres, sonata and rondo forms, some early twentieth-century techniques (not enough, however, to preclude the need for another text or supplementary materials on twentieth-century music), and even neo-Riemannian operations and parsimonious voice leading. As a result, the book should work quite well at schools that require most students to take only two years of theory, without upper-division classes in form and counterpoint.

All of this material comes in a beautifully designed format with musical examples and plenty of white space on almost every page. Too many times, however, an example appears on page other than the one that refers to it. A better alignment of examples and text with even more white space is recommended for a second edition. The overall organization and the format of the individual chapters witness to the care of a master teacher who clearly knows and is ever mindful of his audiences. The text is clear but not condescending, thorough but not dense. Well-marked headings set off main topics within the chapters; key terms are printed in bold face. Chapters regularly introduce a topic through conceptual models, examples from real literature, analytical guidelines, instructions on how to reproduce the structure in question, and relatively extensive analyses, from two to six paragraphs in length. Most analyses include questions that involve the reader. In an analysis from the chapter on cadences, for instance, we read "Why is it that only the last of

[2]Example 1 is reproduced from p. 180 of the text.

these three cadences is really conclusive?" (p. 233) Most chapters include a concise summary in list form and, where part-writing is involved, a list of "typical errors to avoid," each in a colored box that can be found easily. Inexplicably, the chapter on nondominant sevenths does not have these aids; it should. IV^7-V is a minefield for freshmen! Each chapter ends with a list of terms for review, and some suggestions of other pieces by composers represented in the chapter. The book has a thorough index but no glossary, a feature that should be added in future editions.

Teachers, on the other hand, will be delighted to find a text with copious exercises, a workbook with supplemental exercises as well as keyboard progressions, an anthology of pieces mentioned and analyzed in the text, and a CD set with recordings of most of the examples. Most sets of exercises include an assortment of pitch patterns to be sung that reinforce the concepts introduced in the chapter. Consider for instance the pattern reproduced in Example 2, designed to reinforce the three main uses of the second-inversion triad.[3] Many exercises include concise summaries of procedures, set off in colored boxes for ease of reference. The exercises balance analysis and writing, isolated structures and larger contexts, real literature and abstract patterns, bass realization and melodic harmonization.

Many details of the content and organization of *Harmony in Context* are exceptional and need to become standard fare in undergraduate texts. Chapters on fundamentals, for instance, are designated in a distinct way to emphasize their rudimentary status: the first seven chapters are designated as A through G, whereas the next chapter, "The Connection of Chords," is listed as chapter 1. Chapter D provides an introduction to two-part species counterpoint, the best context for teaching about melodic embellishments, consonance and dissonance, and parallel perfect intervals, even for programs that only aim to teach harmony in the first two years. Exercises throughout the book often employ real literature, even when unnecessary to do so. Students are asked, for instance, to name intervals in passages by Bach, Chopin, and Wagner. Students learn about compound and

[3]Example 2 is reproduced from p. 323 of the text.

simple meters through singing and thinking about familiar tunes such as "Pop Goes the Weasel," "Row, Row, Row Your Boat," and "Old MacDonald." Roig-Francolí describes the plagal cadence as a prolongation of a final I; in other words, he presents the plagal cadence as subsidiary to the authentic cadence, not on par with it as most books imply by their undiscriminating descriptions of the "four common cadences." In a chapter on thematic development, he describes and gives examples of such techniques as variation, change of mode, fragmentation, intervallic expansion, inversion, cadential extension, and interpolation. He includes a section on compound melody. In the chapter on nonchord tones, he notes that simultaneous NCTs are generally consonant with each other. To the normal list of arpeggiated, passing, neighbor, and cadential $\frac{6}{4}$, Roig-Francolí adds the "oscillating" $\frac{6}{4}$ of the "oom-pah" bass and designates it a "consonant tonic chord." (p. 312) In a section headed "Metric Reduction," he encourages students to rewrite (whether literally or merely in imagination) arpeggiated passages in block chords in order to more clearly visualize voice leading. In chapter 11, he introduces hypermeter, including in his discussion fascinating and useful analyses of relationships between hypermetrical accent and harmonic function. The first half of the book ends with a summary chart of all the basic diatonic patterns discussed, and the second half ends with a summary chart of all the chromatic patterns. Chapter 28 gives several extensive analyses of *Lieder*, putting much of the content of the book into practice and showing how to incorporate text into a musical analysis. Again, all these features are outstanding, and Roig-Francolí is to be congratulated for including them and thereby setting a new standard in undergraduate theory texts.

Of course the central feature of the book is its incorporation of Schenkerian concepts. Roig-Francolí elegantly and accessibly introduces the concept of various levels of harmonic activity in chapter 2, "The Tonic and Dominant Triads in Root Position." The tonic and dominant chords can be combined at several different levels of musical activity and structure. In the first place, the I-V-I progression is often found as a harmonic unit of adjacent chords at the local level. Tonic and dominant, on the other hand, constitute the basic harmonies in several cadential types. In this category, they have a role in the articulation of form. Finally, the I-V-I progression underlies larger

formal and compositional spans, and from this point of view these harmonies represent the structural pillars on which larger formal units and complete compositions are built. (pp. 160-161). Similarly, he describes IV as potentially both a prolongation of I (when he labels it a "subdominant") and as a preparation for V (when he labels it a "predominant"). In several instances, he analyzes harmonic progressions at two different levels, and more than once he states that we can hear harmonies working at multiple levels. (See, for instance, pp.186 and 353.)

For the most part, Roig-Francolí explains Schenkerian concepts clearly, and smoothly synthesizes them with the ideas of root motion, Roman-numeral labeling, and part writing found in undergraduate texts of the Piston-Ottman tradition. His signal success in doing so represents the greatest strength of the book. The synthesis is not flawless, however. For instance, Roig-Francolí doesn't resolve tensions between traditional views about the mediant harmony. On p. 137, he introduces I-iii-V as the most common progression involving root motion by thirds, with no mention here of prolongational levels; the passage gives the student the impression that iii-V is a common local-level succession. On p. 136, in describing Rameauvian principles of root motion, he describes iii-IV as a "standard" progression involving roots ascending by second, but this standard progression is not recognized again for the remainder of the book. Then on pp. 410-412, Schenkerian explanations surface again when he describes iii as an arpeggiational prolongation of I. In both the examples from real literature shown in this discussion, iii moves to IV, but his analysis explains iii as a prolongation of I, and IV as a preparation for V. No mention is made of any familiar connection between iii and IV.

A similar problem arises with analysis of second-inversion triads. Roig-Francolí recognizes that, although Roman-numeral analysis of most second-inversion triads is misleading since these dissonant prolongations do not normally operate according to principles of root motion, most freshmen need to see a vertical structure and put a label on it before they can begin to distinguish levels of harmony. He brilliantly opts to label the passing $\frac{6}{4}$ as simply P^{6}_{4} and the neighbor as N . (He uses ♭II for the Neapolitan to avoid confusion.) On the cadential , however, he places a Roman numeral: his preference is to call it V . The problem occurs when in his part-writing sum-

mary in this chapter he tells students always to double the fifth of a $\frac{6}{4}$ chord; this injunction only makes sense if the cadential $\frac{6}{4}$ chord is conceived of as a $I\frac{6}{4}$.

Roig-Francolí passes along several other problematic definitions and explanations he has inherited from tradition. Among them:

- The use of "flat" and "sharp" to indicate lowered and raised scale degrees, even when the actual accidentals clash with these designations.
- The admission that mnemonic tricks are acceptable ways to learn key signatures. On p. 49, he says, "You should learn all the key signatures by memory." On p. 52, however, he encourages students to figure the key signature of a minor key by referring to its relative major. Such crutches are ultimately more harmful than helpful.
- The demonstration of triadic inversions by close-position three-note chords on a treble clef. (See example 3.[4]) The designation of a note in the treble clef as a bass note is confusing, and, partly as a result, students in every theory class see a chart such as this one and mistakenly conclude that inversion has something to do with the top note of a chord. This kind of demonstration must disappear from undergraduate textbooks in favor of one like that shown in example 4.
- Excessive emphasis on common tones in voice leading. In listing basic rules of voice leading, Roig-Francolí begins, "*General principle.* When connecting two chords, leave any common tone(s) between the chords in the same voices." Three sentences later, however, he declares voice leading like that in example 5 "quite acceptable." (p. 142)
- The presentation of Neapolitan-sixth and augmented-sixth chords in the same chapter. The similarity of their names coupled with the packaged presentation sometimes confuses students.
- The introduction of the term "linear chromaticism" late in the book (p. 752 in this case), seeming to imply that augmented sixths and secondary dominants are not the result of linear chromaticism.

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[4]Example 3 is reproduced from p. 93 of the text.

In some cases, he simply makes some minor mistakes that will require special handling by a teacher using the book. In the chapter on intervals, for instance, Roig-Francolí distinguishes size and quality, as if an augmented 5th is not larger than a perfect 5th. "To determine the size of an interval," he says, "count the number of notes between the two pitches, including both pitches in your count." (p. 6) He means, of course, to count the number of letter names or scale steps, but that wouldn't be clear to the average student. In defining a period, he says "it consists of at least two phrases, the last of which closes with a PAC," with no mention of criteria concerning other cadences. (He corrects this definition on p. 246.) In the chapter on modulation to closely related keys, he says that an F major chord cannot act as a diatonic pivot in G minor, although earlier he defines all alterations of the sixth and seventh scale degrees in minor as diatonic. (Later, on p. 639, he says that the major IV chord is "foreign to minor.") Also in this chapter he creates a potential problem by teaching that a "diatonic pivot chord" usually comes right before the dominant chord of the new key while a "chromatic pivot chord" usually *is* the dominant chord of the new key. In the chapter on small forms, Roig-Francolí introduces the term "binary-ternary form," an oxymoron most teachers will find hard to sell to a sophomore class. In the same chapter, he says on p. 592 that the sections in ternary form may be harmonically open, but on p. 599 that they are each closed and independent. In his discussion on the Tristan prelude, he argues that G♯ must be considered part of the Tristan chord because it is longer than the A. In doing so, he misses the opportunity to point out that embellishments in nineteenth-century music often exceed their resolutions in length, as many of the examples in his book demonstrate. (See pp. 349, 359, and 361, for instance.)

One problem deserving special attention concerns the time period the book covers. Roig-Francolí states that "in this book as a whole we will study in detail the harmonic relationships that define Western tonality" and defines Western tonality as "the specific system on which Western music is based from about the mid-seventeenth to the late nineteenth centuries." (p. 45) But he regularly strays from this time period in his examples. In the chapter on cadences, for instance,

he includes the passage by Palestrina reproduced in example 6.[5] He labels the cadence at m. 42 as a deceptive cadence and describes mm. 42-44 as "the final cadence." (p. 230) Palestrina no doubt considered the bass note on the downbeat of m. 42 as significant as we do, but his conception of the cadence focused on the intervallic interplay of tenor and superius, especially the arrival of the octave in m. 42. Other anachronisms involving pre-tonal materials occur in attempts to explain modal vestiges in Bach chorales by Schenkerian means (p. 416, for instance), and the presentation of the III-VII-i "progression" found in the Romanesca and Folia basslines.

More significant problems occur, though, in dealing with music from after the designated historical period. Roig-Francolí introduces many examples from twentieth-century popular repertoires: by his count, "approximately fifty." (p. xi) The reason for inclusion of these examples, however, is unclear. Does he mean to appeal to students through familiar examples? If so, "Can't Buy Me Love" and "Don't Cry for Me Argentina" may meet the criterion. But "Everybody's Talkin'"? Also problematic are the piano arrangements he uses to represent these songs, especially in the case of "Candle in the Wind," where the piano part shown bears little resemblance to what Elton John actually plays (see Ex. 9.3a, p. 313). (Unfortunately even the notated inversions, the focus of the discussion of this song, are inaccurate.)

The question of the appropriateness of these examples to a book on the common practice raises further concerns. Roig-Francolí seems unclear himself on whether such music follows common-practice methods. On p. 136 he says that "the progression V-IV is very unusual in common practice harmony, although it is quite common in blues and rock music," indicating a clear point of distinction between the harmonic idioms of the common practice and those of post-tonal popular music. And on p. 455, he says, "Chordal dissonances in popular music are often more 'harmonically' than 'linearly' conceived," and offers as an example dominant-seventh chords on the first and fourth scale degrees in blues and blues-based rock. On p. 151, however, he tells us that "the style of chordal functional harmony which this book represents . . . is still practiced to the present day in

[5]Example 6 is reproduced from p. 230 of the text.

most commercial music." While many theorists join Roig-Francolí in making the claim, this reviewer simply cannot agree.[6] In any case, surely the presence of harmonies like ii/iii (p. 511), an 11th chord mislabeled as a 9th chord (also p. 511), and blue notes that conflict with the harmony (p. 290) suggests that such songs are counterproductive as examples in a book on common-practice music.

Finally, I must take exception to Roig-Francolí's explanation on pp. 468-70 of the reasons for studying music theory. He seems to recognize only two ends for such a study: composition and performance. He begins to admit in one sentence that understanding a piece's structure is a valuable end in itself, but proceeds quickly to a four-page explanation of ways theory can help performance. He does not suggest that theory might help in the teaching of music, and the noble goal of placing music in a wider context and using theory to increase our understanding of humanity, nature, and God is nowhere in sight.

The problems mentioned here do not detract from the overall success of the book, however. Teachers can easily note in class and correct the few errors, inevitable in any undertaking as monumental as the 900-page *Harmony in Context*, and we may hope that subsequent editions will address them one way or another. As for differences in philosophy, treated correctly they provide the basis for the best conversations in class. *Harmony in Context* should prove a popular choice for teachers who have a realistic view of today's freshmen and sophomores but want to lead them through a comprehensive course toward the goal of being able to do something that resembles what professionals do.

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[6]For an argument refuting the claim that popular music of the second half of the twentieth century follows common-practice standards, I might be allowed to recommend Ken Stephenson, *What to Listen for in Rock* (New Haven: Yale University Press, 2002).

CONTRIBUTORS

Robert Gauldin is Professor Emeritus of Music Theory at the Eastman School of Music. In addition to his three texts on counterpoint and harmony, he has authored numerous articles on diverse topics. A past president of the Society for Music Theory, he was recently awarded the Gail Boyd de Stwolinski prize for lifetime achievement in music theory pedagogy and scholarship.

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Ken Stephenson is an Associate Professor of Music Theory at the University of Oklahoma. His book *What to Listen for in Rock* is available from Yale University Press.

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ERRATA

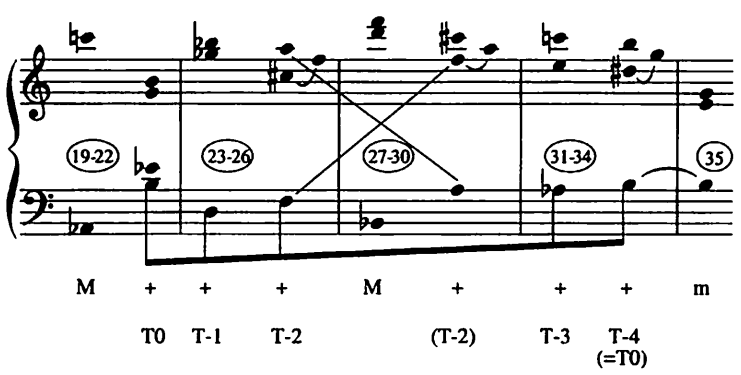
The following errors appeared in Volume 14:

David Temperley's surname was mispelled as Temperly in his report on the MusicCog/2001 Conference.

Example 2 of Gordon Sly's article "Competing Analyses as Analytical Strategy in Hugo Wolf's *Das verlassene Mägdlein*" was printed incorrectly. The correct version appears below.

The editorial staff apologizes for these errors.

Example 2: Wolf, *Das verlassene Mägdlein*: Series of Augmented Triads in the Central Section



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