



JOURNAL OF MUSIC THEORY PEDAGOGY

Volume Twenty 2006

JOURNAL
OF
MUSIC THEORY
PEDAGOGY

Volume Twenty 2006

SCHOOL OF MUSIC
THE UNIVERSITY OF OKLAHOMA

JOURNAL OF MUSIC THEORY PEDAGOGY

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Journal of Music Theory Pedagogy
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Student/Emeritus	\$15.00
Library/Institution	\$40.00
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The Gail Boyd de Stwolinski Center
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James H. Faulconer, Director

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ISSN 0891-7639

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Twenty Years for the *Journal of Music Theory Pedagogy*

Timothy A. Smith, Editor

This issue marks the twentieth year of the Gail Boyd de Stwolinski Center for Music Theory Pedagogy and publication of the *Journal of Music Theory Pedagogy*. On such an occasion it is appropriate to acknowledge the many people who have made this achievement possible.

In 1983 Gail Boyd de Stwolinski retired from the music theory faculty at the University of Oklahoma. To commemorate the distinguished career of this remarkable person, her friends set out to realize her dream of a forum for promoting excellence in the teaching of music theory. The goal — a journal, or center of some kind — required funding. Gail's colleagues and former students, James Faulconer and Alice Lanning, took the first step by soliciting advice from colleagues around the country. With endorsements from Bruce Benward, Robert Gauldin, Mary Wennerstrom, Robert Ottman, and others, Faulconer and Lanning were able to secure a permanent endowment from students, friends, and Gail's husband of forty-five years, Louis de Stwolinski. Gail continued to be involved, from a respectful distance, and lived to see this publication recognized as the only national journal entirely devoted to the pedagogy of music theory.

Two years after Dr. de Stwolinski's retirement Michael Rogers was invited to the University of Oklahoma. Having recently published his seminal *Teaching Approaches in Music Theory* (Southern Illinois University Press), Rogers was recruited, in part, to assist in preparation of the forthcoming journal (1987). In anticipation, Bruce Benward organized an analysis competition for graduate students, offering publication to its winners. In a technological first-of-its-kind, *JMTP* was prepared in desktop applications, with Ellen Rogers, Michael's wife, providing invaluable assistance. Rogers, Faulconer, and Lanning collaborated editorially for the Journal's first three years, with Rogers continuing as sole editor for the next three.

For twenty years Jim Faulconer has served as the Director of the Center, and Alice Lanning as the Journal's tireless Managing Editor. In 1993 Mike Rogers passed the editorial baton to Mary Wennerstrom (Indiana University) who served in that capacity for six years. Under each administration *JMTP* has profited from the expertise of its Editorial Review Board, dedicated always to promoting the best practices in music theory pedagogy. To these individuals, too numerous to name, we are extremely grateful.

When the final history of the *Journal of Music Theory Pedagogy* is written, due praise must be accorded to my predecessor, Kent Williams of the University of North Carolina, Greensboro. Under his able leadership (1999-2005) *JMTP* reestablished a legacy of timely publication that I accept as a personal responsibility to perpetuate. This goal would be impossible without the dedication of our current Editorial Review Board, the distinguished colleagues listed at the front of this issue. I am especially thankful to Mary Arlin (Ithaca College) who has graciously agreed to chair the board. I value her experience and insight into the particulars of our profession, and rely upon her advice often.

Collectively we have devoted this administration to quick turnaround of submissions, as well as the promotion of a substantial increase in the quantity and quality thereof. Knowing that this creates additional work for us, I close with an expression of profound gratitude to my editorial colleagues for their devotion to this enterprise. They continue to serve in the distinguished tradition of so many, unsung in this editorial but well remembered, whose invaluable contributions have made possible these first twenty years.

Timothy A. Smith
Editor





Teaching Phrase Rhythm through Minuets from Haydn's String Quartets

Ryan McClelland

Recent theoretical research places considerable emphasis on aspects of musical temporality. Theorists have reflected on topics such as the definition of rhythm, the factors that create meter, the relationship between rhythm and meter, the operation of meter at levels above the notated measure (hypermeter), phrase expansion, and rhythmic dissonance. Elements of this research have infiltrated some undergraduate theory textbooks, but many limit discussion of rhythm and meter to an introductory chapter on the fundamentals of notation. Phrase rhythm—the interaction of hypermeter with phrase structure—is of undeniable importance to performers and should be incorporated in the core theory curriculum. The nuances of phrase rhythm can be revealed effectively through a diverse group of excerpts, but I have achieved good learning outcomes from pursuing these ideas in a short unit devoted to several minuets by Haydn. After commenting on relevant theoretical and pedagogical literature, I will sketch a presentation of the key aspects of phrase rhythm—hypermeter, hypermetric reinterpretation, and phrase expansion—with examples drawn from the minuets of Haydn's string quartets. The article will conclude with analyses of three complete minuets to suggest the depth and range of musical understanding that a thorough study of phrase rhythm brings to the theory classroom.

THEORETICAL APPROACHES

Within the theoretical community there are significant differences of opinion on principles as fundamental as the relationship between rhythm and meter, the extent to which hypermeter is operative, and the nature of musical accents—in addition to considerable variation in terminology. The responsibility rests with the individual instructor to filter these multiple perspectives through one's musical intuitions to create a coherent viewpoint that communicates to students and enriches their engagement with music. My viewpoint leans heavily on the work of Fred Lerdahl and Ray Jackendoff, Carl Schachter, and

William Rothstein.¹ Although the presentation of my pedagogical approach and analytic examples will reveal my debts to these theorists, I will make a few explicit comments on my theoretical positions. Following Lerdahl and Jackendoff, I maintain a conceptual separation of hypermeter from phrase structure (grouping), a clear delineation of metric accents from structural (tonal) accents as well as phenomenal accents, and an explicit approach to understanding metric entrainment. I endorse their notion of a hierarchical metric grid, but I emphasize the more nuanced concept of hypermeter offered by Schachter and Rothstein. Particularly important for me is Rothstein's thorough study of phrase expansion and its interaction with hypermeter. William Caplin also contributes significantly to the study of phrase expansion through his detailed exposition of thematic construction in the music of the late-eighteenth century.² My focus on the higher-level constructs of hypermeter and phrase structure privileges those elements towards which I gravitate in listening or in preparing a work for performance.³

PEDAGOGICAL APPROACHES

Many popular undergraduate theory textbooks do not aim for comprehensiveness and focus almost exclusively on harmony. *Harmony & Voice Leading* by Carl Schachter and Edward Aldwell, for example, offers thorough coverage of pitch structure and relies

¹ Fred Lerdahl and Ray Jackendoff, *A Generative Theory of Tonal Music* (Cambridge: MIT Press, 1983); Carl Schachter, "Aspects of Meter," *Music Forum* 6 (1987): 1-59, and reprinted in *Unfoldings: Essays in Schenkerian Theory and Analysis*, ed. Joseph N. Straus (New York: Oxford University Press, 1999), 79-120; William Rothstein, *Phrase Rhythm in Tonal Music* (New York: Schirmer Books, 1989).

² William Caplin, *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart, and Beethoven* (Oxford: Oxford University Press, 1998).

³ Both Rothstein and Schachter have written on performance. See Rothstein, "Analysis and the Act of Performance," in *The Practice of Performance: Studies in Musical Interpretation*, ed. John Rink (Cambridge: Cambridge University Press, 1995), 217-40; Schachter, "Chopin's Prelude in D major, Op. 28, No. 5: Analysis and Performance," *Journal of Music Theory Pedagogy* 8 (1994): 27-46; idem, "Playing What the Composer Didn't Write: Analysis and Rhythmic Aspects of Performance," in *Pianist, Scholar, Connoisseur: Essays in honor of Jacob Lateiner*, ed. Bruce Brubaker and Jane Gottlieb (Stuyvesant, NY: Pendragon, 2000), 47-68. For an application of Rothstein's theoretical ideas to performance, see Marie Rolf and Elizabeth West Marvin, "Analytical Issues and Interpretive Decisions in Two Songs by Richard Strauss," *Intégral* 4 (1990): 67-103.

on the instructor to pursue other topics.⁴ Aldwell and Schachter do define the term hypermeasure in chapter 3 (Rhythm and Meter) as “a group of measures that is regulated by meter, so that the whole group sounds like a large measure.” (42) They explain that “the normal organization of measure groups is duple, with strong and weak measures alternating” but do include an exceptional example of three-measure hypermeasures. After this foray into large-scale metric structure, hypermeasure is never again mentioned. In *Tonal Harmony* Stefan Kostka and Dorothy Payne give cursory surveys of phrase structure and form without broaching topics like hypermeter and phrase expansion.⁵ In his chapter on phrase structure (chapter 12), Robert Gauldin introduces phrase “extension” and “contraction” and these concepts do return in several of the extended analyses of complete pieces.⁶ In the same chapter, he briefly mentions “hypermetric level” as an alternate approach to periodic phrase lengths, but he does not pursue the topic at any length.⁷ In a subsequent chapter on rhythm and meter (chapter 18), Gauldin presents the term hypermeasure, but he restricts it to pieces “in very fast tempos” usually notated in 3/4 or 3/8 (meters that he refers to as compound single meters). This is the sole appearance of the term hypermeasure in the text.⁸

The trend among the newest theory texts—those by Steven Laitz, Jane Clendinning and Elizabeth West Marvin, and Miguel Roig-Francolí—is towards greater inclusion of topics other than harmony and voice leading.⁹ Hypermeter and phrase expansion are surprisingly absent from Laitz’s generally excellent approach.

⁴ Carl Schachter and Edward Aldwell, *Harmony & Voice Leading*, 3d edition (Belmont, CA: Thomson, 2003).

⁵ Stefan Kostka and Dorothy Payne, *Tonal Harmony with an Introduction to Twentieth-Century Music*, 5th edition (New York: McGraw-Hill, 2004).

⁶ Robert Gauldin, *Harmonic Practice in Tonal Music*, 2d edition (New York: Norton, 2004).

⁷ Gauldin’s mention of “hypermetric level” in the chapter on phrase structure is a new feature of the second edition.

⁸ In the original edition of his text, Gauldin (like Aldwell and Schachter) presented hypermeasure at the end of the chapter on the fundamentals of rhythm and meter.

⁹ Jane Piper Clendinning and Elizabeth West Marvin, *The Musician’s Guide to Theory and Analysis* (New York: Norton, 2005); Steven G. Laitz, *The Complete Musician: An Integrated Approach to Tonal Theory, Analysis, and Listening* (New York: Oxford University Press, 2003); Miguel A. Roig-Francolí, *Harmony in Context* (New York: McGraw-Hill, 2003).

Hypermeter receives its only mention at the outset of a chapter on symmetrical harmony in the nineteenth century (chapter 32); Laitz sets up a dichotomy between the symmetry of melody, meter, and phrase structure and the asymmetry of harmonic and scalar structures in eighteenth-century music. About “music from the Classical period (c. 1750-1820)” Laitz writes:

Metrically, the music of this era moves in predictably proportioned patterns that allows a deeper level of measured periodicity to arise in a phenomenon called hypermeter. And formally, we usually think of Classical musical units at all levels as structures featuring regularly recurring measure lengths such as four-measure phrases and eight-measure periods. (641)

This rhetorical flourish belatedly reveals Laitz’s contention that the temporal dimensions of the repertoire he emphasizes—Haydn, Mozart, Beethoven, and Schubert—are so thoroughly periodic and symmetrical that departures from these normative structures need not be addressed even in a comprehensive text. Laitz’s treatment of phrase and period structures contains only a single example of a phrase with a length other than four or eight measures (example 14.15 on page 253). Not considering the aesthetic effects and structural bases of phrases of other lengths misrepresents the richness of phrase rhythm in his core repertoire (except possibly in the case of Schubert). This oversimplification makes students less able to come to terms with music that they are performing. Laitz pays considerable attention to the thought processes of performers and links theoretical concepts with listening and with performance concerns. Yet, his sanitized approach to phrase structure risks students’ perceiving the very disjuncture between theory and performance that most aspects of his text effectively combat.

The treatments of phrase rhythm in the texts by Clendinning and West Marvin and by Roig-Francolí are the most extensive among texts designed for the core theory curriculum. Clendinning and West Marvin devote twelve pages to phrase rhythm in a chapter that comes only three chapters after phrase and period designs were explained and that appears before discussion of applied chords and modulations (other than tonicizations of the dominant). Clearly, Clendinning and West Marvin do not consider phrase rhythm peripheral. Clendinning and West Marvin share

Rothstein's perspectives, even adopting terminology that is not particularly common outside of his work (e.g., prefix and suffix for expansions before the beginning and after the end of a phrase). Clendinning and West Marvin define and demonstrate all of the key elements: hypermeter, elision, metric reinterpretation, and phrase expansion (prefix/suffix and internal expansion). The treatment of each concept is brief, and they choose to emphasize the more easily grasped concepts. There are, for instance, three musical examples of prefixes (two of which are short piano introductions at the start of lieder) and only a single example of an internal phrase expansion.

Roig-Francolí provides a more detailed presentation of phrase expansion and hypermeter. He introduces "phrase extension" already in chapter 7, having introduced phrase and period structures in the previous chapter. Roig-Francolí presents "initial extensions" and "cadential extensions" but appropriately devotes more space to "internal extensions." His treatment of internal expansions focuses on phrases that are immediately repeated with inserted material, or parallel periods in which the consequent phrase is longer than the antecedent phrase. Particularly noteworthy is his study of an expanded consequent phrase in the last movement of Mozart's Piano Concerto in D minor, K. 466 (examples 7.14 and 7.15 on page 275). Roig-Francolí provides two recompositions of Mozart's nine-measure consequent phrase, one that shows a four-measure prototype and a second version that gives an intermediate six-measure version. Four chapters later, Roig-Francolí explains hypermeter and embarks on an elaborate exploration of the interaction between hypermetric accents and the emphases that result from tonal motion and formal initiation/completion (what he terms tonal, harmonic, and structural accents). An important omission from Roig-Francolí's text, however, is hypermetric reinterpretation (as frequently occurs at phrase elisions).

Roig-Francolí's handling of hypermeter merits additional comment. Unlike Clendinning and West Marvin (and Rothstein, and my pedagogical approach), Roig-Francolí does not use Arabic numerals to indicate hypermeter. Instead, he employs the accent and unaccent symbols from prosodic analysis seemingly to show that

patterns of weak and strong beats are reproduced at multiple levels of the metric hierarchy.¹⁰ Students, however, should be accustomed to feeling accentual differences when counting or conducting “1-2-3-4” within a measure, and they can transfer this experience directly to hypermeter. I always introduce students to hypermeter by asking them to conduct (or count) along with a recording and subsequently showing them the score, which reveals that they were experiencing notated measures as beats. I would find it more difficult to maintain that direct experience of hypermeter through a network of accent and unaccent symbols. Besides, many teachers of performance intone measure numbers as students play to guide them towards effective overall shaping of phrases, and hypermeter is not unrelated to that technique.

The real motivation for Roig-Francolí’s hypermetric notation only becomes apparent several pages later in his discussion of the first eight measures of the third movement of Beethoven’s Fifth Symphony; Roig-Francolí’s analysis (example 11.9 on page 358) is reproduced in Example 1. The arrows above mm. 1 and 8 indicate “structural accents” which correspond to moments of initiation and arrival (cadence). The accent and unaccent symbols represent the hypermeter, and the brackets indicate the hypermeasures. Roig-Francolí writes, “We notice immediately that metric accents fall on measures 2, 4, 6, and 8, while the odd-numbered measures, in this case, are clearly unaccented.” Roig-Francolí permits a hypermeasure to have an accentual profile different from a measure; he explains that the normative organization of a four-measure hypermeasure is “strong-weak-strong-weak” whereas this Beethoven hypermeasure has a “weak-strong-weak-strong” accentual profile.¹¹ This is a conceptualization of hypermeter that differs from Lerdahl and

¹⁰ Roig-Francolí’s examples are visually reminiscent of those in Grosvenor Cooper and Leonard B. Meyer, *The Rhythmic Structure of Music* (Chicago: University of Chicago Press, 1960). Cooper and Meyer’s strong and weak accents, though, are not hypermetric accents; within the measure, their accents generally correspond closely to metric accents but as they approach the level of the phrase the accents reflect structural events like cadences.

¹¹ Roig-Francolí consistently uses the same accent symbol for the two strong beats within a four-measure hypermeasure, even though one doesn’t experience these moments as equally strong (just as one doesn’t experience the first and third beats within 4/4 meter as equally strong). In his initial presentation of meter, though, Roig-Francolí does note that in quadruple meters beat 3 is weaker than beat 1, despite the fact that his diagrams in that chapter also use the same accent symbol for both beats.



Example 1 - Roig-Francolí's analysis of Beethoven, Symphony No. 5, III, mm. 1-8

Jackendoff, Rothstein, Schachter, and my idea of hypermeter. If one holds as axiomatic that a four-measure hypermeasure begins with a strong beat, then this excerpt is understood as a conflict between grouping and hypermeter. Measures 1-4 and 5-8 (the brackets in Roig-Francolí's example) represent groups (subphrases), while the first hypermeasure begins only at m. 2.¹² In the specific case of the opening of the third movement from Beethoven's Fifth Symphony, though, the location of hypermetric accents may not be quite as unambiguous as Roig-Francolí asserts (despite the fact that Schenker and Tovey agree on the hypermetric strength of the second measure). The ascending quarter-note upbeat from scale degree 5 to scale degree 1 is a standard minuet/scherzo beginning, and hearing an extended upbeat requires one to adduce sufficient elements in this opening to reject this stylistically common schema.

The scrutiny of this example from Roig-Francolí's text offers tangible proof of the divergent conceptions of hypermeter among theorists. It also highlights one of the challenges that authors of introductory textbooks grapple with. A more sophisticated treatment of any subject inherently leads to a less neutral presentation, which may not adapt as easily to the approaches of a broad spectrum of instructors. For this instructor, none of the textbooks designed for the core curriculum has a completely satisfactory approach to phrase rhythm. I will now outline one that I find effective.

¹² This is also the interpretation advanced by Lerdahl and Jackendoff (see page 34 of *A Generative Theory of Tonal Music*). This view is implicit in the readings of this passage by Tovey and Schenker. Both Tovey and Schenker use Arabic numerals, and place a "1" in the second measure. Tovey places a "4" in the first measure while Schenker labels it as an upbeat. See Donald Francis Tovey, *Essays in Musical Analysis*, vol. 1 (London: Oxford University Press, 1935), 42; Heinrich Schenker, *Free Composition*, trans. and ed. Ernst Oster (New York: Longman, 1979), figure 146, no. 5.

Despite the importance of hypermeter, I do not believe that it should be introduced at the start of theory instruction with the fundamental principles of metric organization and rhythmic notation. Students need to internalize meter first and later transfer that understanding to a higher level of musical structure. I also delay teaching hypermeter until after phrase and period organization so that students focus on tonal and melodic structures in locating and describing phrases and periods. Introducing hypermeter before students have some security in finding cadences and phrase boundaries might have the unintended consequence of encouraging a measure-counting approach to phrase identification. I prefer to introduce hypermeter around the same time as applied chords and diatonic modulation, as students begin to consider longer stretches of music. On the other hand, I mention phrase expansion soon after developing the concepts of phrases and periods and outlining typical configurations of melodic subphrases within phrases and periods. I explore phrases with irregular lengths and suggest how they may relate to a more common phrase length, but this is accomplished without mention of hypermeter.

At some later point in the curriculum—my preference is when students begin to study form—it is crucial to revisit phrase structure and hypermeter to consider their interactions, which, following Rothstein, I collectively refer to as phrase rhythm. The balance of this article offers an approach to teaching phrase rhythm through minuets by Haydn. Why minuets from Haydn string quartets? The music of Haydn, Mozart, and Beethoven offers an excellent starting point for examining the interaction of phrase design and metric structure. I have singled out Haydn string quartet minuets for several reasons. First, Haydn minuets are short enough that it is possible to work with complete pieces rather than excerpts.¹³ Second, for the majority of these minuets, students can understand the tonal structure once applied chords and modulation to closely related keys have been presented; among the fifty-seven minuet movements in Haydn's mature string quartets (Op. 9 to Op. 77),

¹³ Frequently, I do examine only the minuet section or only the trio section of a movement. In Haydn's practice, the minuet and trio components rarely share similar structural features. A movement with significant shared material such as the minuet-trio from Op. 50, No. 5 represents the exception rather than the norm.

fewer than half include advanced harmonic materials (augmented sixths, Neapolitan sixth, mixture, modulation to distantly related keys). Whether this is an important consideration depends on curricular design. I prefer to start the study of form before completing chromatic harmony to demonstrate the breadth of analysis earlier in the curriculum. Even in a curriculum that begins with an exclusive concentration on four-part writing and harmonic analysis and culminates in a study of form, though, minuet-trio form is typically one of the first forms encountered. A third motivation for using minuets from string quartets is to develop score-reading skill. Finally, Haydn's minuets possess a wide array of phrase designs and hypermetric organizations. The minuet and the similar *passepied* were the only eighteenth-century dances whose steps spanned two measures of the notated meter. Thus, in minuets composed for dancing, of which Haydn penned many, the music consistently projects two-measure hypermeter. In his art minuets, Haydn sometimes remains close to functional minuets, but often wittily engages convention by exploring more varied phrase design and hypermetric organization.¹⁴ This is especially the case in the minuets he wrote for string quartet. Focusing on a unified group of pieces allows students to assimilate thoroughly the conventions of style and genre and thereby become more sensitive to the rich dialogue with convention that animates the works of Viennese classicism.

¹⁴ Gretchen Wheelock has written on Haydn's play with conventions, including a study of several minuets from his symphonies. Although Wheelock focuses on Haydn's incorporation of elements from other genres (like canon or country dance), she does note a couple of instances of unexpected delays and expansions. See Gretchen A. Wheelock, *Haydn's Ingenious Jestings with Art: Contexts of Musical Wit and Humor* (New York: Schirmer Books, 1992), esp. 55-89.

PHRASE RHYTHM

Minuets that have periodic hypermeter and symmetrical phrase structure provide an appropriate starting point. Examples 2 and 3 give the scores to the first part of two such pieces.¹⁵ Although both have four-measure hypermeter, they have different relationships between these hypermeasures and phrase lengths. Throughout Op. 20, No. 6 the phrases are four measures in length while throughout

Example 2 - Op. 20, No. 6 (minuet), mm. 1-8

Example 3 - Op. 33, No. 4 (scherzo), mm. 1-8

¹⁵ Other movements that adhere strictly to four-measure hypermeter and have phrases that are congruent with that hypermeter are: Op. 9, No. 5 (minuet and trio), Op. 20, No. 4 (minuet and trio, though much syncopation in the minuet), Op. 20, No. 6 (minuet), Op. 33, No. 3 (trio), Op. 33, no. 4 (scherzo), Op. 33, No. 5 (trio), Op. 33, No. 6 (trio), Op. 42 (trio), Op. 50, No. 1 (minuet), Op. 50, No. 3 (trio), Op. 54, No. 1 (trio), Op. 64, No. 2 (trio), Op. 64, No. 6 (trio), Op. 71, No. 2 (trio), Op. 76, No. 3 (trio), and Op. 76, No. 6 (trio). (Note that in the Op. 33 quartets, Haydn uses the designation scherzo rather than minuet, but these scherzos do not present a significant change in style.)

Op. 33, No. 4 the phrases are eight measures long (and each is in sentence design!).¹⁶ Since these two movements proceed at almost identical tempos, they provide a vivid reminder that phrase length really does affect the sound of a piece. In both pieces, the pacing of tonal events within hypermeasures is quite unremarkable. The purpose of examples like Op. 20, No. 6 and Op. 33, No. 4 is to provide students with a baseline for comparison with subsequent pieces.

Assuming that students were exposed to phrase expansion soon after phrase and period structures were introduced, they are ready to consider how hypermeter interacts with phrase expansion. Consider the minuet from Op. 20, No. 1 (shown in Example 4). In this minuet, four-measure hypermeter persists throughout. Two moments are of interest. First, as frequently occurs, a stasis on dominant harmony precedes the thematic rounding. The thematic rounding could have begun as early as the anacrusis to m. 21; mm. 21-24 expand the previous tonal arrival on the dominant (mm. 21-24 are a post-cadential expansion, or suffix). Adopting Rothstein's terminology, I make a distinction between surface hypermeter and underlying hypermeter. Measures 21-24 are part of the surface hypermeter but are not part of the underlying hypermeter; the quality of musical time within these measures is different—less directed—than that of the surrounding measures. The hypermetric expansion in mm. 21-24 does not disrupt the periodicity of the surface hypermeter, since it introduces exactly four additional measures; I will give instances below of hypermetric expansions that do disturb the periodicity of the surface hypermeter. A second significant moment in this minuet occurs after m. 36. Measures 25 to 32 recapitulate the music of mm. 1-8, and m. 33 begins a further repetition of this material. At m. 36, the expected $A\flat$ in the melody and V_5^6 harmony are dramatically displaced by $A^{\sharp}$ and an applied vii_5^{o6} chord. This surprising harmony is prolonged throughout the following two measures until

¹⁶ I reserve the term phrase for a segment of music that makes a complete tonal motion and ends with a cadence. Caplin, idiosyncratically, employs the term differently and calls a sentence's first four measures a phrase. In his usage, a phrase is a "functionally neutral term of grouping structure and refers, in general, to a discrete group approximately four measures in length." (260, n5) Caplin's usage goes against the sense of completion that musicians intuitively associate with the concept of phrase.

Allegretto

Hypermeter: 1 2 3 4 1 2 3 4

9

16

23

Rounding

cresc.

f

p

1 2 3 4 1 2 3

4 1 2 3 4 (1) 2

3 4) 1 2 3 4 1 2

Example 4 - Op. 20, No. 1 (minuet)

31

3 4 1 2 3 4 NB 1

38

2 3 4 1 2 3 4

Example 4 - Op. 20, No. 1 (minuet) *Continued*

it resolves to dominant harmony. This three-measure prolongation of a single—and chromatic—harmony, however, does not correlate with a phrase or hypermetric expansion. Like mm. 1-8 and 25-32, mm. 33-40 consist of a single eight-measure phrase that contains two four-measure hypermeasures. The expressive effect of mm. 33-40 changes not only because of the unexpected harmony in m. 36 but also because of the lack of harmonic and rhythmic motion at the start of m. 37. Measures 33-40 are no longer articulated into two four-measure subphrases, but their hypermetric structure remains the same. An unusually long harmony or a thematic repetition does not always signify expansion; as always in musical analysis, context must be evaluated.

The minuet movements from Haydn's string quartets provide many other instances of hypermetric expansions that maintain the periodicity of the surface hypermeter. Other examples of an expanded fourth hyperbeat¹⁷ at the dominant arrival before the

¹⁷ A hyperbeat is a beat in a hypermeasure; hyperbeats correspond to notated downbeats. "Fourth hyperbeat" thus refers to the downbeat of the fourth measure within a hypermeasure. In some contexts, I prefer the term "hyperdownbeat" over "first hyperbeat" but these terms are synonymous.

thematic rounding include the minuets of Op. 55, No. 3 (mm. 21-24), Op. 64, No. 2 (mm. 23-26), and Op. 76, No. 4 (mm. 25-28). Occasionally, this fourth hyperbeat is expanded by more than four additional measures; an eight-measure expansion occurs in the minuet of Op. 64, No. 4 (mm. 17-24), and a twelve-measure expansion in the trio of Op. 50, No. 6 (mm. 45-56). Expansions of other hyperbeats occasionally, but rarely, leave the surface hypermeter strictly periodic. An example of a second hyperbeat that is expanded by four additional measures occurs in the last phrase of the trio from Op. 50, No. 4 (mm. 62-66). In the minuet from Op. 77, No. 2, a first hyperbeat is similarly expanded (mm. 5-9). Sometimes an expansion that preserves the periodicity of the surface hypermeter results from an expansion of more than one hyperbeat. The final eight measures of the trio of Op. 50, No. 6 (mm. 79-86) are an expansion of a four-measure unit stated earlier (mm. 69-72). By comparing the expanded version with the earlier passage, one observes that the second hyperbeat is expanded by three measures and the third hyperbeat is expanded by one measure.

Before considering more complex interactions of phrase structure and hypermeter, I introduce the crucial concept of hypermetric reinterpretation.¹⁸ The most frequent type of reinterpretation is a fourth hyperbeat that also acts as the downbeat of the next hypermeasure. Hypermetric reinterpretation results from overlap in the phrase structure, either at the level of the phrase itself or between constituent subphrases. In the minuet genre, overlap and reinterpretation are much more common between subphrases than between phrases. The minuet from Op. 42 (shown in Example 5) illustrates. The first eight measures establish four-measure hypermeter. In the second part, the thematic rounding begins at m. 16, and it is preceded by a seven-measure prolongation of the dominant. Measures 9-12 take up the thematic material of mm. 1-4, but the eighth notes in m. 12 become the basis for a new two-measure idea. In other words, at the subphrase level m. 12 groups both with the preceding and following measures. The seven-measure span that precedes the thematic rounding consists of two

¹⁸ Rothstein uses the term "metrical reinterpretation" but I prefer hypermetric reinterpretation since it is more accurate: the reinterpretation occurs at a hypermetric level, not a metric one. In any case, I find "reinterpretation" much more connected to musical experience—and thus more pedagogically valuable—than Lerdahl and Jackendoff's "metrical deletion."

overlapped hypermeasures. Following Rothstein's notation, I have shown the hypermetric reinterpretation with $4=1$ in m. 12. Despite the considerable length of the dominant prolongation, there is no phrase expansion here. Haydn could have written a four-measure prolongation of dominant harmony, but not with the melodic idea that he selected. To propose a four-measure prototype for this

Allegretto

Hypermeter: 1 2 3 4 1

2 3 4 1 2 3

4=1 2 3 4 1

Rounding

Example 5 - Op. 42 (minuet), mm. 1-16

passage would necessarily remove essential components of the tonal structure of this passage. As soon as the first violin transposes the A-G $\sharp$ -A-B figure up by step, the outcome of the melodic motion in the first hypermeasure becomes D, which is a dissonant fourth above the bass. Since the essential melodic motion in mm. 9-11 is one pitch per measure (A, B, then C $\sharp$), a quick resolution of D to C $\sharp$ within m. 12 would not be convincing at such an important moment in the form. The dominant prolongation must continue past its fourth measure. An exquisite detail of Haydn's version

29 Rounding

Hypermeter: 1 2 3 4 1 2 3 4 1 2

39

49

Example 6 - Op. 50, No. 3 (minuet), mm. 29-57

TEACHING PHRASE RHYTHM THROUGH MINUETS

Allegro

Hypermeter: 1 2 3 4 parenthesis

7 1 2 3 4 1 2

13 3 4 (OR 1 parenthesis 2 3 4 5 -----

20 Rounding (=mm.1-10) Eb! parenthesis 1 2

Example 7 - Op. 33, No. 2 (scherzo), mm. 1-26

is the maintenance of equal pacing of structural melodic pitches, though at a slower speed; D is the essential melodic tone in mm. 12-13 and it resolves to C $\sharp$ in mm. 14-15.

The hypermetric reinterpretation in the Op. 42 minuet occurs in a passage that does not involve a phrase expansion, but frequently a reinterpretation coincides with the onset of a hypermetric expansion. Example 6 provides the last phrases of the minuet from Op. 50, No. 3. The thematic rounding starts at m. 37 and follows the course of the first part of the minuet until m. 48. At m. 48, the expected perfect authentic cadence is replaced by a deceptive progression. Measure 48 is a fourth hyperbeat, and marks the conclusion of the phrase's underlying hypermeter. Measures 48 to 51 clearly possess a 2 + 2 construction; in other words, m. 48 is also a new beginning, but it is different in kind from the other beginnings of phrase units in the minuet. Measures 48 to 51 are most sensitively viewed as an expansion of the deceptive motion in m. 48. There is a 4=1 hypermetric reinterpretation in m. 48, but the new hyperdownbeat is only part of the surface hypermeter, not part of the underlying hypermeter.

In the phrase expansions discussed thus far, the surface hypermeter has remained strictly periodic or has been periodic except for one hypermetric reinterpretation. With many phrase expansions, the surface hypermeter does not remain periodic; only the underlying hypermeter does. Echo effects provide a pedagogically expedient demonstration of this principle. The second movement from the "Joke" quartet, reproduced in Example 7, is a good choice. The echo measures are sharply delineated by softer dynamics and by changes in instrumentation; they are obviously parenthetical to the primary musical discourse.¹⁹ Particularly wonderful is the effect at m. 24 where a parenthetical passage ends with an E $\flat$ major triad. The structural return to E $\flat$ major harmony clearly occurs only at the following measure due to the obvious

¹⁹ Some may object to my inference of a one-measure echo in mm. 15-16 on the basis that hearing this music as an echo precludes hearing mm. 15-16 and 17-18 as balanced pairs of measures. Whether mm. 15-20 represent an expanded four-measure unit or a true six-measure unit is not entirely clear. I prefer the former interpretation not because it strictly preserves the periodicity of the underlying hypermeter, but because that hearing responds to the phrase's echo effect, which continues this prominent feature of this movement.

differentiation of parenthetical elements, but Haydn plays with the listener's expectation for tonal return at this moment in the form.²⁰

Echo effects are a convincing illustration of our ability to suspend and resume hypermetric counting in response to musical cues. Other techniques for expanding phrases such as harmonic deceleration, repetition of a subphrase, and tonal digression can also break the periodicity of the surface meter but allow an underlying hypermeter to remain accessible. In Op. 33, No. 2, a harmonic deceleration marks the arrival on dominant harmony at m. 19, resulting in a one-measure expansion of a fourth hyperbeat. The last phrase of the minuet from Op. 50, No. 3 (refer back to Example 6) shows repetition of a subphrase expanding the phrase from four to six measures. The hypermetric analysis hears through the expansion to the underlying four-measure hypermeter. Even though the expansion does not establish its own periodic surface hypermeter, I show Arabic numerals beneath the expansion in mm. 54-55 of Example 6 to signify a rehearing of the first and second hyperbeats. With a parenthesis, the musical cues are sufficient to suspend hypermetric counting until after the parenthesis; with an expansion resulting from repetition, the cognitive response is more like redundant counting than the absence of hypermetric counting. It bears reiterating that the hypermetric role of repetition is entirely dependent on context. In an eight-measure sentence, a two-measure subphrase is immediately repeated, and that repetition is essential to the phrase and to the underlying hypermeter. In the example from Op. 50, No. 3, however, the two-measure repetition produces a six-measure phrase in a minuet built entirely from four-measure hypermeasures.

The passages above have demonstrated interactions between phrase structure and hypermeter, and I have emphasized the impact that phrase expansion has on hypermeter. All of the minuets presented thus far strongly privilege four-measure units. Many of Haydn's minuets explore other constructions, although the four-measure phrase and four-measure hypermeter should be seen as normative for the late-eighteenth-century minuet (and a great deal

²⁰ Another minuet that employs echo effects is Op. 71, No. 1. Unlike Op. 33, No. 2, in the minuet of Op. 71, No. 1 the thematic rounding is recomposed without echo effects. In an especially wonderful way, Haydn, integrates most of the pitch content of one of the parentheses into the newly composed final four-measure phrase (compare mm. 11-12 with mm. 37-38 in Op. 71, No. 1).

of other music). Four-measure structures are normative not only because of the statistical frequency with which the minuet repertoire follows these conventions but also because many of the minuets that depart from them seem to do so in a deliberately willful manner. I will now explore three minuets in greater detail to demonstrate musical insights that can emerge from a thorough study of phrase rhythm. The minuet from Op. 74, No. 1 privileges four-measure units, although its use of hypermetric reinterpretation and phrase expansion is pervasive and complex. The minuets from Op. 74, No. 2 and Op. 64, No. 6 play off the conventions of four-measure phrases and hypermeasures, and an understanding of these minuets profits greatly from the awareness of stylistic norms absorbed from the previous examples.

THREE ANALYSES

The minuet from Op. 74, No. 1 (score in Example 8) reinforces the concept of hypermetric reinterpretation, and it also features phrase expansions that do not sustain a periodic surface hypermeter. The music immediately establishes four-measure hypermeter through the abrupt changes in melodic material, rhythm, and texture at m. 5. After this clear separation between the first two hypermeasures, the first part of the minuet connects its remaining hypermeasures through reinterpretation. Students looking at the score are tempted to opt for a superficially simpler understanding: viewing mm. 5-7 and 8-10 as three-measure hypermeasures. Not only are three-measure hypermeasures atypical of the genre, but they parse the harmonic progressions inappropriately. The chords in mm. 7 and 10 are both dominant sevenths, and one cannot properly feel their tonal resolutions without continuing the hypermeasure into the following measure. Playing this passage at the keyboard with slight pauses at the ends of mm. 7 and 10 convinces students of the need for

TEACHING PHRASE RHYTHM THROUGH MINUETS

Allegretto

Hypermeter: 1 2 3 4 1 2 3 4=1 2

10

3 4 (=1) 2 3 4) 1 2 3

18

4 1 2 3 4 1 2 3 4

27

Rounding

cresc.

1 2 3 4 ----- 1 2 3

Example 8 - Op. 74, No. 1 (minuet)

35

4 1 2 3 4=1 2 (3 4=1 2) 3

45

cre - scen - do *f*

cre - scen - do *f*

cre - scen - do *f*

cre - scen - do *f*

4 ----- 1 2 3 4

(=1 2 3 4)

53

fz *fz* *fz* *fz* *fz* *fz* *fz* *fz*

1 2 3 parenthetical insertion 4 -----

Example 8 - Op. 74, No. 1 (minuet) *Continued*

continuity and thus the presence of hypermetric reinterpretations in mm. 8 and 11. The analysis in Example 8 takes mm. 11-14 as a four-measure suffix to the phrase, which means that the fourth hyperbeat in the underlying hypermeter occurs at m. 11 and is expanded. One might consider mm. 11-14 as integral to the phrase since they do perform the essential function of giving G (rather than B) prominent placement in the upper line. Measures 11-14 cannot stand as an independent phrase, but I prefer hearing these measures as a suffix rather than as a continuation of the previous phrase because of their lack of harmonic motion and their rhetoric.

Instead of growing smoothly out of the preceding material, they draw on a conventionalized closing gesture, undercutting—even mocking—the cantilena of the previous six measures.

The second part begins with a sequence whose units coincide with four-measure hypermeasures. Dominant harmony returns at m. 27 and also forms the basis of a hypermeasure. The fourth hyperbeat is expanded by a single measure through the repetitive oscillations of the first violin; the last four eighth notes of m. 30 could have been F[#]—G—F[#]—D (or there could have been two beats of silence at the end of m. 30). The thematic rounding follows the course of the minuet's opening until m. 40 where Haydn enharmonically reinterprets C[#] as D^b. This spawns a tonal digression towards $\flat$ VI (which was the structural underpinning of mm. 15-26), and this extra tonal content expands the predominant portion of the phrase until the dominant arrival at m. 45. The remoteness of the harmony is not the only indication of an expansion; mm. 39-45 are based on the harmonic progression and voice leading of mm. 8-11. Example 9 clarifies the connection between these two locations. Playing these harmonic reductions at the keyboard convinces students that the distinction between surface and underlying hypermeters is a valid, albeit sometimes subtle, distinction. After this chromatic digression, Haydn brings back the opening thematic idea with its tonal and rhythmic solidity. This time there is no motivic, rhythmic, or textural change at the end of the four-measure hypermeasure. The continuity between mm. 52-53 suggests that the opening four-measure unit will finally generate a cohesive eight-measure phrase and carry the minuet to a rousing close. Instead, at the moment when the perfect authentic cadence is expected, Haydn interjects three measures based on the material from the suffix at the end of the first part of the minuet. These three measures are a parenthetical

(a) Measures 8-11 (b) Model for measures 39-45 (c) Measures 39-45

I 6 IV 5 #5 6 V 6 / V (ii 6) I 6 iv 5 #6 vii 07 / V (b II 6) I 6 iv 5 #6 V 7 / $\flat$ VI $\flat$ III vii 07 / IV vii 07 / V

Example 9 - Harmonic reductions of mm. 8-11 and 39-45

Allegro

Hypermeter: 1 2 3 4 1 2 3 4

9

1 2 3 4 (4) 1

15 Rounding

2 3 4 1 2 3 4

22

Surface hypermeter: 3 4

5 6 1 2 3 4

Example 10 - Op. 74, No. 2 (minuet)

29

35

1 2 3 4 1 cresc. 2

3 4 1 2 3 4

Example 10 - Op. 74, No. 2 (minuet) *Continued*

insertion, and a particularly jarring one with the strongly projected hemiola in mm. 56-57.²¹ Balance is restored in the final two measures with a gesture that not only recalls the final two measures of the first part but is a stock closing gesture in the Classical style.

A minuet that plays off the convention of the four-measure phrase is Op. 74, No. 2 (score in Example 10). The first part establishes four-measure hypermeter quite strongly through the parallelism of mm. 1 and 2 with mm. 5 and 6. The phrase structure, though, consists of a single phrase rather than two balanced four-measure phrases. An eight-measure phrase is not inherently unusual, but this one arises unexpectedly. The chromatic chord in m. 4 displaces an impending half cadence at the last instant; comparison of the score with the recomposition given in Example 11 shows how close the music comes to achieving a half cadence in m. 4.

The thematic rounding follows up on the first violin's C[#] and the

²¹ Rothstein gives these three measures as an example of parenthetical insertion in *Phrase Rhythm in Tonal Music*, 89. His interpretation of hypermeter in mm. 49-60 is the same as mine.



Example 11 - Recomposition of mm. 1-8 from Op. 74, No. 2

missing half cadence. The $C^\sharp$ arrives at m. 21, which is the fourth measure of the rounding, but the harmonic support is altered. The $C^\sharp$ is no longer given consonant support; it is dissonant against a supertonic harmony. This harmony, in turn, leads to the dominant, providing the half cadence that was previously denied. The thematic rounding does consist of antecedent and consequent phrases, but neither is four measures long: the antecedent phrase comprises mm. 18 to 24, and the consequent phrase mm. 25 to 37.

I have indicated my hypermetric reading on the score, although other interpretations are possible and would form the basis for class discussion. I will discuss a couple of aspects of my analysis. First, the dominant arrival in mm. 23-24 acts as a single hyperbeat. These two notated measures are heard as parallel to m. 21; the extended notated durations and the fermatas represent a composed-out *ritardando* and are not perceived as metric. Second, a weak hyperbeat in the underlying hypermeter coincides with a strong hyperbeat in the surface hypermeter at the cadence that ends the consequent phrase (m. 37). Given the obvious duple patterning in the previous six measures, m. 37 is a strong beat in the surface hypermeter. Yet, in the underlying prototype, the cadence would have occurred at m. 28, a fourth hyperbeat. I understand the hypermetric strength of m. 37 as a surface feature that adds emphasis to an arrival that is essentially hypermetrically weak. Although it is not impossible to have consecutive hyperdownbeats, hearing the different structural levels at play makes the initiation of a codetta in mm. 38-41 less metrically disjunct and subtly shapes how performers nuance the cadence at m. 37.

TEACHING PHRASE RHYTHM THROUGH MINUETS

Allegretto

Hypermeter: 1 2 3 4 5 6

7 1 2 3 4 5 6 1 2

15 3 4 1 2 3 4 1

22 2 3 4 1 2 3 4

∞ Rounding

Example 12 - Op. 64, No. 6 (minuet)

Example 12 - Op. 64, No. 6 (minuet) *Continued*

The minuet from Op. 64, No. 6 is in some ways simpler than either of the previous two minuets, but it is a minuet where four-measure units are initially less privileged (score in Example 12). The first part consists of two parallel phrases, each six measures long. In principle, these twelve measures admit several possible hypermetric interpretations. It would be possible to posit four-measure hypermeter, but that hypermeter would cut across the phrase structure. In this repertoire, phrase structure has a decisive impact on large-scale meter; m. 7 is hypermetrically comparable to m. 1. This suggests two alternatives: a pair of six-measure hypermeasures or a pair of expanded four-measure hypermeasures. The surface hypermeter is certainly in six-measure units with pairs of measures grouped triply at the level of the phrase. The question is whether these six-measure units are basic structures or whether they represent expansions of underlying four-measure spans. In this composition, there is no definitive answer. Through elimination of the repetition in m. 2 (and m. 8) and the embellishing chord in m. 3 (and m. 9), a syntactically correct four-measure prototype emerges, a possibility shown in Example 13. Determining whether this prototype is the basis for Haydn's version or represents, in effect, a different piece of music is an aesthetic judgment. Perhaps the most productive conceptualization is to recognize both of these perspectives with the understanding that in a single performance or mental rehearsing only one of these interpretations is fully available. It is less stimulating to maintain that meter above the two-measure level is not operative. There is enough periodicity to promote some type of higher-level metric hearing. Not directing any attention to these longer spans misses the interplay between duration and tonal function at the fourth measure in each phrase; mm. 4 and 10 have the rhythmic slowing associated with cadence

Allegretto

Hypermeter: 1 2 3 4 1 2 3 4

Example 13 - Hypothetical recomposition of first part (mm. 1-12)

(which one expects in this style in a fourth measure) but they have harmonies that are inappropriate as tonal goals. Experiencing the potential of hearing an expansion within the first four measures highlights the accelerations in the harmonic rhythm in the rhythm of the first violin's melody in mm. 5-6.

The minuet's second part begins with a single eight-measure phrase that coordinates with four-measure hypermeter. When the first part of a Haydn minuet departs considerably from norms of phrase design and hypermeter, the start of the second part often brings a restoration of conventional structures.²² Haydn recomposes the thematic rounding; it consists of sixteen measures, clearly divided into twelve measures plus a four-measure codetta. The twelve-measure span no longer suggests a 6 + 6 division. Instead, the surface hypermeter is 4 + 4 + 4 and the phrase design weakly articulates 8 + 4 within a single twelve-measure phrase. (A deceptive cadence can—rarely—end a phrase, but the submediant in m. 28 does not provide a phrase-ending cadence.) Particularly beautiful is the stepwise line from the C in m. 26 to the F in m. 30 that bridge the phrase's 8 + 4 division. The clear four-measure hypermeter and the expansion of the phrase length react to the stylistically marked structures of the opening and create large-scale metric process—even resolution—in the minuet.

²² For other demonstrations of this principle, see Op. 20, No. 3 (minuet), Op. 54, No. 1 (minuet), Op. 64, No. 4 (trio), and Op. 76, No. 5 (trio).

CONCLUSION

This article has argued for the necessity of intensive study of phrase rhythm in the undergraduate theory curriculum and has outlined one pedagogical approach. I have not probed all of the interesting possibilities within Haydn's minuets; a particularly ambitious instructor might explore at least three additional categories of minuets. First, several of the minuets from Haydn's string quartets begin with an unaccompanied melodic gesture significantly longer than the relatively common quarter-note upbeat. When these unaccompanied gestures span more than a measure, it can be unclear whether the first hyperdownbeat falls at the start of the first or the second notated measure. In some minuets this becomes a significant compositional feature that is skillfully prepared or rewritten at subsequent thematic returns. Minuets that incorporate extended upbeats include Op. 50, No. 5, Op. 71, No. 2, Op. 71, No. 3, and Op. 76, No. 3.²³ Second, a few movements explore unusual phrase lengths to a greater extent than seen above in Op. 64, No. 6. Five-measure phrases are a key element in the minuets of Op. 20, No. 3 and Op. 54, No. 1 and in the trio of Op. 64, No. 4. Study of these movements will stimulate discussion of the limits of hypermeter, although this topic will of course come up as one broadens out from the minuet repertoire. Third, there are a few minuets that are particularly willful in their use of hypermetric expansion and/or the rhythmic dissonance of duple grouping of beats. Perhaps the most metrically sophisticated of all of Haydn's minuets are those from Op. 33, No. 5, Op. 50, No. 4, Op. 77, No. 1, and Op. 77, No. 2.

²³ I explore these and other minuets in "Extended Upbeats in the Classical Minuet: Interactions with Hypermeter and Phrase Structure," *Music Theory Spectrum* 28, no. 1 (2006): 23-56.

Authors of composition manuals in the eighteenth century often used minuets to introduce composition. In our twenty-first century classrooms, minuets can still serve as pedagogical tools.²⁴ Haydn's minuets provide a corpus of music that allows one to demonstrate phrase rhythm as a meaningful aspect of a composition and to go beyond mere definitions of concepts like hypermeter and phrase expansion to reveal their musical effects.

²⁴ This is an opinion also expressed recently by Stefan Eckert in "'So, you want to write a Minuet?' Historical Perspectives in Teaching Theory," *Music Theory Online* 11, no. 2 (2005). Eckert draws on Mozart's earliest minuets and a treatise by Riepel to introduce students to composing minuets. As Eckert is designing introductory compositional exercises, his students write minuets that adhere strictly to four-measure hypermeasures. Such a compositional introduction to the basics of minuet writing would make excellent preparation for the more advanced analytic unit outlined in the present article.



Studying Perle's Motivic Processes through Contour Transformation

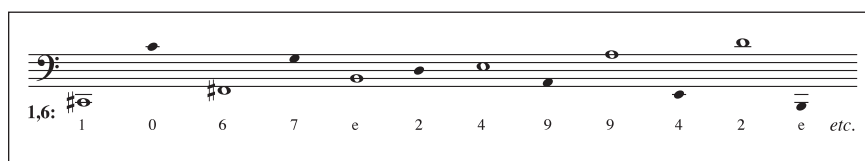
Gretchen C. Foley

Teachers of 20th century analytical techniques often bypass George Perle's music in their curricula, since the majority of Perle's compositions emanate from his theory of "twelve-tone tonality." Few college theory teachers are sufficiently conversant with Perle's twelve-tone tonality to lead students in analyses of this body of music. Perle's theory is a compositional method based on the intersection of interval cycles and symmetrical pitch class collections. Yet his method is analogous to tonal theory in its utilization of scales, chords, and hierarchical relationships. Moreover, in most of his compositions Perle reveals a penchant for traditional forms and developmental techniques. This article contends that Perle's predilection offers the college teacher an ideal means of access into this music. Nowhere is this more evident than in his *Woodwind Quintet No. 4*, which captured the Pulitzer Prize for Music in 1986. Perle's *Quintet* contains four movements: Invention, Scherzo, Pastorale, and Finale. Each of these movements adheres to a traditional formal design: the Invention is based on the Baroque contrapuntal model, the Scherzo comprises alternating scherzo and trio sections, the Pastorale follows a ternary form, and the Finale reprises the main motives of the preceding movements, but in new contexts.

This article aims to demonstrate how a college theory teacher may present Perle's music from a perspective that integrates aspects of his innovative compositional method with familiar formal structures and developmental processes. We will begin by introducing the essential components of twelve-tone tonality and observing how these components comprise the fundamental pitch material in the first movement of the *Quintet*, the Invention. We then will reveal how Perle's invention conforms to the traditional procedures of the Baroque model, focusing specifically on the processes Perle employs for motivic development.

INTRODUCTION TO TWELVE-TONE TONALITY

The interval cycle provides the foundation for the system of twelve-tone tonality. Perle uses two inversionally related interval cycles in alternation to form a “cyclic set,” as seen in the ascending and descending interval 5 (perfect 4th) cycles in Example 1.¹ The ascending cycle is shown in whole notes; the descending cycle is shown in stemless black noteheads. Integers 0 to 11 represent the 12 pitch classes, with C = 0, C $\sharp$ / D $\flat$ = 1, D = 2, and so on. B $\flat$ and B are represented by integers 10 and 11, replaced by the single-digit entities ‘t’ and ‘e’ respectively.² In this formation any given pitch class forms a pair of sums with its neighbor notes. These sums repeat throughout the cyclic set and are called “tonic sums.” The tonic sums provide the cyclic set with its name; the cyclic set in Example 1 is 1,6.³



Example 1: Inversionally related P4 cycles combine to form cyclic set 1,6

Any two vertically aligned cyclic sets form an “array,” and give the array its name. In Example 2a, two cyclic sets built from interval 5 cycles combine to form the array 4,9/1,6. Cyclic sets of different intervals may also combine to form arrays, as shown in Example 2b, in which the array 9,e/1,6 comprises cyclic sets built with interval 2 and interval 5 cycles. To create melodic and harmonic

¹ Readers seeking further information on Perle’s theory of twelve-tone tonality may consult any of the following sources: Thomas Patrick Carrabr , “Twelve-Tone Tonality and the Music of George Perle” (Ph.D. diss., City University of New York, 1993); Gretchen C. Foley, “Pitch and Interval Structures in George Perle’s Theory of Twelve-Tone Tonality” (Ph.D., University of Western Ontario, 1999); Gretchen C. Foley, “Arrays and K-Nets: Transformational Relationships within Perle’s Twelve-Tone Tonality” (*Indiana Theory Review* 23, 2002: 69-97); Dave Headlam, “Tonality and Twelve-Tone Tonality: The Recent Music of George Perle” (*International Journal of Musicology* 4, 1995 : 301-33); George Perle, *Twelve-Tone Tonality* (Berkeley, CA: University of California Press, 1977, 1996); George Perle, *The Listening Composer* (Berkeley, CA: University of California Press, 1990), and Stephen L. Rosenhaus, “Harmonic Motion in George Perle’s ‘Wind Quintet No. 4’” (Ph.D. diss., New York University, 1995).

² The pitch classes are shown here as specific pitches for purposes of illustration. In practice they may be notated in any register.

³ The cyclic set 1,6 may begin with any pitch class, as may any other cyclic set. Moreover, all cyclic sets eventually wrap around to their beginning pitch classes.

material Perle takes segments from the cyclic sets of arrays and combines them into units of varying size. Example 2b illustrates two possible segmentations in array 9,e/1,6: a tetrachord {2, 7, 6, 7} and a pentachord {3, 8, 1, 9, 4}.

(a) Array 4,9/1,6 constructed from two cyclic sets of the same interval (P4), and (b) Cyclic sets of different intervals (M2 and P4) combine to form array 9,e/1,6, with tetrachordal and pentachordal segmentations

Example 2: (a) Array 4,9/1,6 constructed from two cyclic sets of the same interval (P4), and (b) Cyclic sets of different intervals (M2 and P4) combine to form array 9,e/1,6, with tetrachordal and pentachordal segmentations

The position of the cyclic sets is not fixed within an array. Rather, the cyclic sets may shift horizontally in relation to one another in the manner of a slide rule, thereby creating different vertical alignments between the cyclic sets. This flexibility allows the array to function as a rich resource for generating compositional material. For instance, the lower cyclic set 1,6 shifts in Example 3a, creating new possibilities for segmentation, such as the tetrachord {8, 1, 7, e}. Furthermore, either the same or different partitions of an interval cycle may be used within the context of the same cyclic set. In Examples 2b, 3a, and 3b the cyclic set 9,e utilizes both cycles [0-2-4-6-8-t] and [1-3-5-7-9-e] in inversive relationships, rather than just one cycle or the other.

Example 3 consists of two musical examples, (a) and (b), each showing a two-voice texture with a treble and bass staff. Below the staves are numerical sequences and letters representing pitch classes.

(a) Tetrachord [8-1-7-e] created from two dyadic segments. The treble staff has notes corresponding to pitch classes 0, 9, 2, 7, 4, 5, 6, 3, 8, 1, t, e, etc. The bass staff has notes corresponding to pitch classes 3, 3, t, 8, 5, 1, 0, 6, 7, e, 2, 4. A box highlights the segment [8 1] in the treble and [7 e] in the bass.

(b) Hexachord [e-t-1-7-6-0] from two trichordal segments of cyclic sets. The treble staff has notes corresponding to pitch classes 9, 0, e, t, 1, 8, 3, 6, 5, 4, 7, 2, etc. The bass staff has notes corresponding to pitch classes 2, e, 7, 6, 0, 1, 5, 8, t, 3, 3, t. A box highlights the segment [e t 1] in the treble and [7 6 0] in the bass.

Example 3: Segments of cyclic sets, in two different alignments, of array 9,e/1,6. (a) Tetrachord [8-1-7-e] created from two dyadic segments, and (b) Hexachord [e-t-1-7-6-0] from two trichordal segments of cyclic sets

The segments from the array typically appear at the musical surface as unordered collections of pitches. We can observe Perle's compositional disposition of array segments in the first two measures of the *Invention*. Example 4 shows tetrachordal, pentachordal, and hexachordal units extracted from the array 9,e/1,6. The careful reader will note that these segments do not occupy adjacent positions in the array itself. In fact, the units segmented in Example 3a and b appear as the second and fifth segments in m.2 of the *Invention*. Thus, the composer may move freely within and among the cyclic sets in the array. In addition, there is no obligation to use the entire array, and the music may modulate to any other array at any time. Hence, the array serves as a pre-compositional resource; the analyst may discover segments of the array in individual melodic lines, interweaving among different lines, and as vertical sonorities such as chords. That is, the two-voice texture suggested by an array may be realized in an infinite number of surface musical settings, as determined by the composer.

Flute

Oboe

Clarinet in Bb

Horn in F

Bassoon

$\text{♩} = 132-120$

9.e: et
1.6: 1.0

- 4 7
5 8 t

et l
4 9 -

et 8 l 2 9 et
7 6 7 e 8 t t 3

et l
7 6 0

Example 4: Segmentation of mm.1-2 (Perle's "Invention" from *Wind Quintet No. 4*) Copyright ©1987 by Galaxy Music Corporation All Rights Reserved International Copyright Secured

THE COMPONENTS OF THE INVENTION

We could analyze the entire piece in this way to deepen our understanding of how the theory of twelve-tone tonality is utilized in composition; however, this type of analysis does not lend itself readily to aural comprehension. Surprisingly, a more conventional analytical approach will garner more easily accessible observations. Despite the uniqueness of the theory, most of Perle's works are formally structured according to traditional compositional designs. This movement is named "Invention" precisely because it follows the conventional plan of the Baroque invention.

An invention is a short contrapuntal piece for two voices based on the development of motivic material. There is no standard model of the invention as a form *per se*; it is better understood as a procedure, as evidenced by the wide variety of structures and formats of inventions in the musical canon. Nonetheless, certain features emerge as common to most inventions: motives, counter-motives, and episodic passages.

Perle's invention opens with the first statement of the primary motive, divided into two parts. The clarinet presents the head of the motive; the last note of the head dovetails with the first note of the tail, played by the oboe. The counter-motive appears more or less consistently with the tail of the motive throughout the invention, and is heard first in the bassoon. Virtually all statements of the counter-motive feature homophonic accompaniment, as shown in the dotted segmentation of the other instruments in m. 2 of Example 5.⁴

⁴ It should be noted that homophonic accompaniment is a distinct departure from more traditional invention textures.

Wind Quintet No. 4
Invention George Perle

5a

5b

Example 5: Main elements in Perle's Invention, mm. 1-17 (a) mm. 1-4 and (b) mm. 5-8. Copyright ©1987 by Galaxy Music Corporation All Rights Reserved International Copyright Secured

5c

FL.

Ob.

B-CL.

Hn.

Bsn.

CADENTIAL

MOTIVE

COUNTER-MOTIVE

EPISODE

5d

FL.

Ob.

B-CL.

Hn.

Bsn.

EPISODE-PART 1

EPISODE-PART 2

Example 5: Main elements in Perle's *Invention*, mm. 1-17 (c) mm. 9-12 and (d) mm. 13-16. Copyright ©1987 by Galaxy Music Corporation All Rights Reserved International Copyright Secured

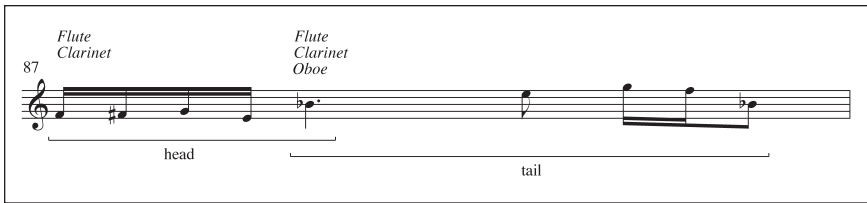
Perle follows the first statement of the counter-motive with a secondary motive. Like the primary motive, the secondary motive is divided into a head (played by the horn) and a tail (played by the bassoon), which overlap each other by one note. The remaining instruments again provide chordal accompaniment. This secondary motive is not as prevalent as the primary motive, but it does appear at significant formal junctures in the invention.

As with all inventions, this piece proceeds by alternating motive entries with episodic passages. Episodes are intended to provide relief from continuous statements of the motive. In Perle's invention even the episodes constitute two parts, with a contrapuntal first part followed by a homophonic second part. This textural contrast is analogous to that of the primary motive and chordally accompanied counter-motive. Throughout the piece one may encounter passages that are too short to be episodic. Such passages are often more readily understood as transitional or cadential in function. Example 5 highlights a cadential passage in mm. 5-6.

In addition to the homophonic passages mentioned above, Perle's invention departs tradition from another standpoint: Most inventions are composed for two voices, but Perle's is scored for five. Nonetheless, through careful combinations of the five instruments of the wind quintet, Perle conveys an impression of two independent parts.

TRANSFORMATIONS OF THE PRIMARY MOTIVE

Perle's approach to this invention is based *not* on the traditional tonic-dominant relationships of diatonic tonality, but on the underlying symmetrical relationships of twelve-tone tonality. Yet we clearly hear the piece as an invention because of Perle's adherence to the standard procedure of alternating the principal components of motive, counter-motive, and episode. The primary motive appears in fourteen statements over the course of this invention. Each statement has been transformed by some contrapuntal process. Example 6 shows the simplest of these transformations in the final entry in m. 87, a straightforward transposition of the primary motive by T6.



Example 6: Transposition of primary motive by T6, m. 87

Perle incorporates many of the conventional means of motivic development throughout this invention. In addition to transposition, Perle utilizes inversion, sequence, intervallic change, fragmentation, extension, contraction, and augmentation. He applies these techniques to both of the distinct components of the primary motive—the head and the tail. In many cases, the tail itself further divides into two subsets for separate transformations. For the most part the characteristic rhythms of the head and tail remain intact in each appearance, thereby facilitating recognition of the primary motive underlying the various transformations.⁵ In addition, the listener will recognize the primary motive because of its distinctive contour. We may describe this contour in general terms as a small arch plus leap for the head, and a larger arch for the tail.

Joseph N. Straus has discussed contour recognition in his textbook on post-tonal theory:

As listeners, we may sometimes find it easier to attend to the general shapes of music, its motions up and down, higher and lower. These are aspects of musical *contour*. To make sense of musical contour, we do not need to know the exact notes and intervals; we only need to know which notes are higher and which are lower.⁶

This is particularly helpful in listening to Perle's invention, where we hear motivic statements as clearly being related by transposition or inversion, although the relationship is not exact in terms of interval sizes. Straus asserts that "approaching contour

⁵ Due to the relative stability of the rhythm in the primary motive, issues of rhythm will not be pursued further in this article, except in cases where rhythmic change is a specific means of motivic transformation.

⁶ Joseph N. Straus, *Introduction to Post-Tonal Theory*, 3rd ed. (Upper Saddle River: Prentice Hall, 2005), 99.

in this way permits us to discuss musical shapes and gestures with clarity.”⁷

As a result, we will approach our study of the motivic transformations in Perle’s invention from the perspective of contour analysis. We will employ Robert Morris’s method for representing the contour of a fragment, in which each pitch is assigned an integer based on its position in relation to the other pitches within the contour.⁸ The lowest pitch is designated as 0, the highest pitch is designated the integer that is one less than the cardinality of the fragment. Thus, the pitches comprising the primary motive in m.1 [B³-C⁴-C^{#4}-Bb³-E⁴-Bb⁴-C^{#5}-B⁴-E⁴] are represented by the contour segment <123045764>. Since Perle frequently treats the head and tail to separate transformations in the invention, Example 7 displays individual contour segments for each component, with the head as <12304>, and the tail as <01320>.

The image shows a musical staff with two staves. The top staff is labeled 'Clarinet' and the bottom staff is labeled 'Oboe'. The Clarinet staff contains a sequence of five notes: B3, C4, C#4, Bb3, and E4. The Oboe staff contains a sequence of four notes: Bb4, C#5, B4, and E4. Below the Clarinet staff, the contour segment <1 2 3 0 4> is written. Below the Oboe staff, the contour segment <0 1 3 2 0> is written. A bracket connects the end of the Clarinet sequence to the start of the Oboe sequence, indicating they are part of a single melodic line.

Example 7: Contour segments of primary motive’s head and tail, m. 1

The contour designations for the motive’s head and tail also apply to the modified primary motive in m.7. Example 8a shows that one pitch differs in each of the head (clarinet) and the tail (oboe). Nonetheless, the listener will recognize the gesture to be the primary motive, due to its identical melodic contour, rhythm, and instrumentation. The changes in pitch presumably occur to ensure conformity with the underlying array of twelve-tone tonality. As illustrated earlier in Example 4, the primary motive in m. 1 belongs to array 9,e/6,1, whereas in m. 7 Perle has modulated to array t,e/6,1.

⁷ Straus, 100.

⁸ Robert Morris, *Composition with Pitch-Classes: A Theory of Compositional Design* (New Haven: Yale University Press, 1987), 26-33.

Example 8 consists of three musical staves labeled (a), (b), and (c), each showing a transformation of a primary motive.

- (a) Measures 7-8:** Shows the primary motive in measures 7 and 8. Measure 7 is for Clarinet and measure 8 is for Oboe. The contour is labeled as $\langle 1\ 2\ 3\ 0\ 4 \rangle$ for the first part and $\langle 0\ 1\ 3\ 2\ 0 \rangle$ for the second part.
- (b) Measures 18-19:** Shows the primary motive in measures 18 and 19. Measure 18 is for Oboe and measure 19 is for Bassoon. The contour is labeled as $\langle 3\ 2\ 1\ 4\ 0 \rangle$ for the first part and $\langle 3\ 2\ 0\ 1\ 3 \rangle$ for the second part. The word "inversion" is written above the staff.
- (c) Measures 48-49:** Shows the primary motive in measures 48 and 49. Measure 48 is for Oboe and measure 49 is for Bassoon. The contour is labeled as $\langle 1\ 2\ 3\ 0\ 4 \rangle$ for the first part and $\langle 0\ 1\ 3\ 2\ 0 \rangle$ for the second part. The word "augmentation" is written above the staff.

Example 8: Developmental processes applied to statements of the primary motive: (a) Intervallic change in m.7, (b) inversion in mm. 18-19, and (c) augmentation in mm. 48-49

Measures 18-19 contain the first primary motive to be transformed by inversion in this invention, as demonstrated in Example 8b. In a contour inversion the highest pitch of the contour shifts to become the lowest, the lowest pitch moves to become the highest, and so on for each pitch of the gesture. Thus, while the original contours of the head and tail are $\langle 12304 \rangle$ and $\langle 01320 \rangle$ respectively, the contour of the inverted head in m. 18 is $\langle 32140 \rangle$, and the inverted tail in m. 19 is $\langle 32013 \rangle$. The primary motive has been displaced metrically by two beats in this statement, although its rhythmic values remain intact, thereby assisting the listener in recognizing the gesture as the primary motive, despite its inversion.

The primary motive undergoes several transformations in mm. 48-49. As illustrated in Example 8c, the second and third notes of the motive have moved by T3, while the remaining notes of the motive have shifted by T2. This seemingly inconsistent transpositional process does not disrupt the overall contour, but permits the pitch class material to conform to the current array of 1,3/t,5. Additionally, the motive contains some changes in rhythm as well as pitch: the head appears in augmentation, while the tail retains its original durational values.

Perle also applies several different transpositional operations to the motivic statement in m. 11. Example 9a shows how the pitches of the head have shifted upward, not by a single consistent value, but by T4 for the first, fourth, and fifth notes, and by T5 for the second and third. Nonetheless, since this fragment retains the same rhythm, instrumentation, and <12304> contour, it is clearly recognizable as the head. The tail in m.12 has been expanded by the addition of two pitches. This addition results in a considerably different contour representation: <0143520>. Upon closer inspection, however, we see that Perle has simply repeated the first two notes of the tail in sequence, retaining their original durational values. If we exclude this sequential expansion from consideration for the moment, the tail maintains its <01320> contour. Sequential expansion of the tail occurs in several motive statements throughout the invention, and is systematically applied to either the first two pitches or the last three. As a result, we shall hereinafter refer to these segments as the tail's first and second subsets, represented by contour segments <01> and <210>, respectively.

Example 9 consists of two musical excerpts, (a) and (b), illustrating transformations of a primary motive.

(a) mm. 11-12: This excerpt shows the primary motive in m. 11 and its sequential expansion in m. 12. The primary motive in m. 11 is played by the Clarinet and Oboe, with a contour of <1 2 3 0 4>. The expansion in m. 12 is played by the Flute and Oboe, with a contour of <0 1 4 3 5 2 0>. The expansion is labeled 'seq.' and includes a dashed line indicating the sequence of notes.

(b) mm. 58-60: This excerpt shows the primary motive in m. 59 and its transformation in m. 58. The primary motive in m. 59 is played by the Clarinet and Oboe, with a contour of <1 2 3 0 4>. The transformation in m. 58 is played by the Flute and Oboe, with a contour of <13 2 0 1>. The transformation is labeled 'anticipation' and 'false entry' and includes a dashed line indicating the sequence of notes.

Example 9: Transformation of primary motive through (a) sequential expansion in mm. 11-12, and (b) anticipation, false entry, and sequential expansion in mm. 58-60

False entry is another device utilized by Perle in this invention, as evidenced in Example 9b. In m.58, the flute enters with an anticipatory sustained pitch, followed by four sixteenth notes. Although this rhythmic gesture suggests the onset of the primary motive, its contour proves it to be a false entry: <13201>. Dovetailing the last note of the flute's false entry, the clarinet enters in m. 59 with the head of the true motive (with its pitches transposed by

T7 and T8), followed by tail stated in the oboe. The tail again is expanded in length; the oboe presents the tail's first subset and a sequenced repeat, then the flute joins the oboe to conclude this motivic statement with the second subset.

CONTOUR ADJACENCY SERIES OF MOTIVIC TRANSFORMATIONS

In the remaining statements of the motive, Perle uses other contours that are similar but not identical to those of the primary motive's head and tail. We may recognize the similarity through an array of symbols introduced by Michael Friedmann.⁹ This theorist represents the ordered intervals of a contour in what he calls the "Contour Adjacency Series," or CAS. Friedmann uses the + sign for an ascending interval, the - sign for a descending interval, and the integer 0 to signify a repeated note. Example 10a illustrates how, in the first statement of the primary motive in m.1, the CAS of the head is < + + - + >, and the CAS of the tail is < + + - - >.

The CAS enables us to recognize the motive despite the various transformations of its contour. In m.67, the oboe sustains a pitch that then launches into another entry of the motive, as shown in Example 10b. In this statement, however, the contour of the head has been altered, due to the application of different transpositional values (T9, Tt, and Te). Consequently, it appears that the first and fourth notes exchange their contour position, indicated by the contour label <02314>, versus the <12304> of the original motive's head. Nonetheless, the more general CAS remains unchanged between the two heads, as < + + - + >, allowing the listener to recognize this segment as the motive's head. Likewise, the pitches of the tail have undergone different transpositional operations (Tt and Te), although the contour positions and the CAS remain unchanged.

The opposite situation obtains in the ensuing motive entry of m. 73, as demonstrated in Example 10c. In this statement the contour of the head is unchanged, but the tail's contour, as <12430>, is modified from the original contour of <01320>. Nonetheless, Perle establishes an audible connection to the original tail by retaining the contours of the individual subsets, <01> and <210>. As a result, the CAS of the tail stays constant, as < + + - - >.

⁹ Michael Friedmann, "A Methodology for the Discussion of Contour: Its Application to Schoenberg's Music," *Journal of Music Theory* 29 (1985): 223-248.

Example 10 consists of four staves, each showing a musical motif and its corresponding Contour Adjacency Series (CAS) and intervallic successions.

- (a) Initial motivic statement in m. 1, Oboe. CAS: $\langle 1\ 2\ 3\ 0\ 4 \rangle$, $\langle +\ +\ -\ + \rangle$. Intervallic successions: $\langle 0\ 1 \rangle$, $\langle 2\ 1\ 0 \rangle$.
- (b) Statement with head in modified contour, mm. 66-67, Oboe and Flute. CAS: $\langle 0\ 2\ 3\ 1\ 4 \rangle$, $\langle +\ +\ -\ + \rangle$. Intervallic successions: $\langle 0\ 1\ 3\ 2\ 0 \rangle$, $\langle +\ +\ -\ - \rangle$.
- (c) Statement with tail in modified contour, m. 73, Clarinet and Oboe. CAS: $\langle 1\ 2\ 3\ 0\ 4 \rangle$, $\langle +\ +\ -\ + \rangle$. Intervallic successions: $\langle 0\ 1 \rangle$, $\langle 2\ 1\ 0 \rangle$.
- (d) Statement with inverted head and tail in modified contour, mm. 31-32, Oboe. CAS: $\langle 3\ 2\ 1\ 4\ 0 \rangle$, $\langle -\ -\ +\ - \rangle$. Intervallic successions: $\langle 0\ 1 \rangle$, $\langle 2\ 1\ 0 \rangle$, $\langle 1\ 2\ 4\ 3\ 0 \rangle$, $\langle +\ +\ -\ - \rangle$.

Example 10: Contour Adjacency Series (CAS) of (a) initial motivic statement in m. 1, (b) statement with head in modified contour, mm. 66-67, (c) statement with tail in modified contour, m. 73, and (d) statement with inverted head and tail in modified contour, mm. 31-32

Example 10d demonstrates how Perle subjects the motive to contraction in mm. 31-32. The motive is played in its entirety by a single instrument, the oboe. Perle shortens the note joining the head and tail from a dotted quarter to an eighth note, thereby reducing the motive's length. Yet Perle maintains the separate identities of the head and tail by differing their contour transformations. The head of the motive appears in inversion; the tail's two subsets retain their individual contours although their intervallic successions have been altered. These alterations result in a modified contour for the tail, as $\langle 12430 \rangle$, although the CAS is still $\langle +\ +\ -\ - \rangle$.

The developmental processes applied to the remaining motivic entries prove rather more complex. In Example 11, the clarinet states a transformed primary motive in m. 55, with both the head and the tail comprise different contours, as $\langle 01312 \rangle$ and $\langle 03421 \rangle$. In both cases, however, their CAS are the same as those of the original head

55 *Clarinet*

<0 1 3 1 2>
<+ + - +>

<01>

<210>

seq.

<0 3 4 2 1>
<+ + - ->

Example 11: CAS of motive with modified contours of head and tail, m. 55

and tail. A modified sequential repeat of the second subset extends the length of the tail.

In m. 43 an inverted false entry in the oboe precedes the clarinet's statement of the motive head, given in Example 12. While the head's contour is the same, the time span between the tail's first and second note has been extended by one beat. In addition, the tail is extended by a sequential repetition of its second subset, followed by another statement of the tail. The first subset in this repeat is inverted while the second is not, resulting in an entirely new, descending contour, <43210>, and new CAS <---->.

43 *Oboe* *Clarinet*

false entry

<1 2 3 0 4>
<+ + + +>

<01>

<210>

seq.

inversion
<10>

<210>

<4 3 2 1 0>
< - - - ->

Example 12: CAS of false entry preceding statement of motive, then CAS of with modified tail, expanded by sequenced second subset, followed by repeated tail with inverted first subset

Example 13 presents the motive entry in mm.22-24, which comprises an inverted head with modified contour, resulting from switching the highest and second-highest pitches (the first and fourth notes in the head). Nonetheless, the CAS of the head remains an intact inversion. In the tail, the second subset is repeated in

22 *Flute* *Horn* *Clarinet*

anticipation

<4 2 1 3 0>
<- - - +>

inversion

<0 2 4 3 1>
<+ + - ->

<01>

<210>

seq.

inversion
<10>

inversion
<012>

<2 0 1 2 3>
<- - + + +>

Example 13: CAS of motive with inverted head and modified tail, followed by repeat of tail with inverted subsets

sequence, and then the entire tail is repeated, with both subsets separately inverted. This treatment in the repeated tail forms another new contour, <20123> and corresponding CAS of <-++>.

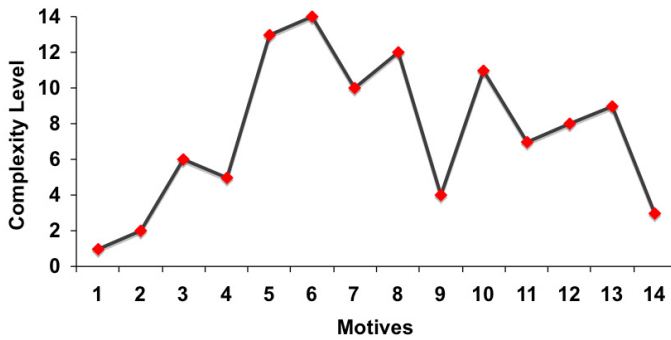
Example 14 is a musical score snippet starting at measure 26. It features three staves: Oboe, Flute, and Bassoon. The Oboe part begins with a measure of augmentation, annotated with the contour <0 1 2 0 3> and the corresponding CAS <+ + - +>. The Flute and Bassoon parts follow with a sequence of notes, annotated with the contour <4 1 3 2 0> and the corresponding CAS <- + - ->. The Flute part then repeats the sequence, annotated with the contour <2 1 0 1 3> and the corresponding CAS <- - + +>. The Bassoon part also repeats the sequence, annotated with the contour <2 1 0 1 3> and the corresponding CAS <- - + +>.

Example 14: CAS of motive with augmented, modified head and tail with inverted first subset, followed by repeated inverted tail with modified contour

The most complex transformation of the motive occurs in mm. 26-29, as shown in Example 14. In this statement the oboe presents the head in a modified augmentation, with a different contour, <01203>, although the general CAS <+ + - +> is preserved from the original head. The tail contains a sequenced repeat of its second subset, followed by both subsets in inversion. In addition, the careful observer may note an interesting transpositional relationship between the tails of the successive statements in m. 24 and 29. In the latter, the first iteration of the tail is an interval 1 transposition, while the sequence is transposed by interval 7. In the repeated tail, the first subset is higher by an interval 7, while the second subset is an interval 1 higher.

We have examined the motives in this invention not in order of occurrence, but in order of the increasing complexity of their transformations. If we instead study the motives chronologically, we will discover that Perle places the most intense transformations midway through the movement and near the end, similar to the design of most other inventions. The graph in Example 15 is a subjective rendering of the complexity of the motives in this invention. The accompanying table below the graph summarizes the developmental processes applied to each motivic statement. We may observe how the most complicated transformations begin to occur just before the midpoint of the invention, with a second surge in complexity about two-thirds of the way, with a decrease in intensity as the invention draws to a close.

Progression of Motivic Complexity



Motivic Statement	Measure numbers	Motivic Process
1 st	m. 1	initial statement of the motive
2 nd	m. 7	one note different in the head and tail
3 rd	mm. 11-12	sequential expansion
4 th	mm. 18-19	inversion
5 th	mm. 22-24	anticipated, inverted, modified head and repeated tail
6 th	mm. 26-29	augmented and modified head, inverted and repeated tail
7 th	m. 31	contraction, inverted head, modified tail
8 th	mm. 43-45	false entry, inverted and repeated tail, sequential expansion
9 th	mm. 48-49	augmentation
10 th	m. 55	modified head and tail, sequential expansion
11 th	mm. 58-60	anticipation, false entry, sequential expansion
12 th	mm. 66-67	modified contour
13 th	m. 73	modified contour
14 th	m. 87	transposition

Example 15: Chronological progression of motivic complexity

SUMMARY

Although this is a non-tonal piece based on Perle's unique compositional theory of twelve-tone tonality, the techniques and processes of the Baroque invention are readily accessible. The basic tonal relationships of the invention are absent (such as key relationships and harmonic cadences), yet the main components of the invention are easily detected through continuity of texture, rhythm, and instrumentation, and most notably through Perle's use of traditional motivic processes, resulting in a variety of contour transformations. Efforts to integrate the more conventional, standardized art forms and newer compositional methods will empower teachers of 20th century analytical techniques to include Perle's compositions in their curricula. Indeed, this article contends that such integration will present new vistas for the next generation of students by introducing them to a body of music that is innovative and exciting.

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Developing Aural Skills: It's Not Just A Game

Deborah Rifkin and Diane Urista

Recent developments in aural skills training have led to alternative approaches that depart from traditional sight-singing and dictation exercises.¹ In this spirit, we developed game playing as an effective strategy for use in our classrooms at Oberlin College Conservatory. We find that game playing fosters good musicianship, while cultivating a positive interactive classroom that is conducive to learning.

We turned to game playing because of our dissatisfaction with traditional dictation exercises. Although dictation can be helpful in promoting some skills, it has disadvantages. More than other activities, dictations can create a debilitating anxiety that impedes learning, especially for the weaker students in the class. Failure to make progress at the beginning of a dictation exercise can overwhelm any possibility of further constructive listening. In addition, if your classroom contains a mix of students with and without perfect pitch, dictation can polarize the class. The students with pitch become bored, while the other students become anxious, even resentful.

We find dictation effective only if the student possesses certain skills—skills that don't necessarily develop by simply taking more dictation. In his seminal book, *Aural Skills Acquisition*, Gary Karpinski identifies four conceptual stages of melodic dictation: hearing, remembering, understanding, and notation.² In traditional

¹ Kate Covington, "An Alternative Approach to Aural Skills Pedagogy," *Journal of Music Theory Pedagogy* 6 (1992): 5-18; Kate Covington and Charles Lord, "Epistemology and Procedure in Aural Training: In Search of a Unification of Music Cognitive Theory with Its Applications," *Music Theory Spectrum* 16, no. 2 (1994): 159-170; Steven Laitz, "Paths to Musicianship," in *Musicianship in the 21st Century: Issues, Trends and Possibilities*, ed. Sam Leong (Sydney: Australian Music Centre, 2003), 130-150. Steve Larson, "'Integrated Music Learning' and Improvisation: Teaching Musicianship and Theory through 'Menus, Maps, and Models'," *College Music Symposium* 35 (1995): 76-90; Peter Silberman, "Post-Tonal Improvisation in the Aural Skills Classroom," *Music Theory Online* 9, no. 2 (2003); and Diane Urista, "Beyond Words: The Moving Body as a Tool for Musical Understanding," *Music Theory Online* 9, no. 3 (2003).

² Gary Karpinski, *Aural Skills Acquisition* (Oxford: Oxford University Press, 2000), 64-92; see also Karpinski, "A Model for Music Perception and its Implications in Melodic Dictation," *Journal of Music Theory Pedagogy* 4 (1990): 191-230.

dictation practice, skills are usually assessed solely in terms of the final stage—notation. Errors in a student's finished exercise will indicate the existence of a problem, but won't necessarily reveal the source of the problem or its solution.

Our gaming strategy addresses some of these problems by developing and assessing skills from the middle stages of Karpinski's model, namely remembering and understanding. This allows instructors to identify where problems occur, and to prescribe appropriate remedies. Furthermore, game playing provides a stimulating and cooperative environment that integrates the class through social interaction and active learning.³ Rather than working in isolation—the usual dictation setting—students work together on a specific skill, group improvisation, or compositional task. Instead of regarding mistakes merely as wrong answers, the mistakes themselves become integral to the learning process. In short, game playing allows students to contribute according to their abilities and to progress at their own pace.

Researchers in other disciplines use game playing to model the essential structures of their subjects. In music, game playing provides insights into human perception and how the mind processes musical stimuli, topics that are among the most complex and elusive problems for aural skills teachers. In this article we present six games with far-reaching ramifications for the development of musicianship skills, including:

- building short- and long-term memory capabilities
- recognizing and becoming fluent with scale-degree functions, modulating techniques, phrase structures and conventions of notation
- improving tonic retention, relative pitch, concentration, and improvisation skills

We organize our discussion into three general sections, according to games that focus on I) scale degree function, II) modulation, and III) phrase structure.

³ Please see Appendix A

SECTION I: GAMES THAT FOCUS ON SCALE-DEGREE FUNCTION

1. Name That Scale Degree

Our first game, “Name That Scale Degree,” develops relative pitch and sensitivity to scale-degree function. In particular, it teaches students to recognize the function of pitches by their positions in the tonal hierarchy.⁴ Students begin the game by standing or sitting in a semi-circle, so as to see and hear each another. They learn by rote the characteristic resolution patterns for each scale degree, which are shown in Example 1a.

Example 1: Resolution patterns for “Name That Scale Degree,” major and minor modes

Notice that each degree of the scale is elaborated by a melodic figure that returns to tonic. After a few hearings, students sing the entire collection of seven patterns on scale-degree numbers.⁵ These patterns become an internalized framework used throughout the aural-skills curriculum.⁶

Students are now ready to identify and sing individual scale degrees. First, they sing the seven-bar resolution pattern, after which the teacher recites a scale degree number. The students must sing back the specified scale degree with its associated melodic figure.

⁴ “Name that Scale Degree” is based on a compilation of ideas derived from different sources. In particular, see Bruce Arnold, *Complete One Note Method* (New York, NY: Muse-Eek Publishing Co., 1995); Bruce Benward and Timothy J. Kolosick, *Instructor’s edition to Ear Training: A Technique for Listening*, 5th ed. (Dubuque: Brown and Benchmark, 1995). We are also indebted to Klaus Sinfelt and Stephan Eckart for sharing their ideas with us.

⁵ The instructor is free to use other systems, such as moveable do. Although we use scale degree numbers, solmization syllables can also be used in all of the games presented here.

⁶ Our discussion focuses on the major-mode pattern shown in Example 1a. The minor mode shown in Example 1b can be introduced at a later stage.

For example, if the teacher says $\hat{2}$, then the student sings back the pattern shown in m. 2 of Example 1a. If the teacher calls out $\hat{5}$, then the student sings back the pattern in m. 5, and so forth. Example 2 illustrates two beginning rounds of “Name that Scale Degree.”

Teacher says “2”	Student(s) sing:	
Teacher says “5”	Student(s) sing:	

Example 2: Beginning Rounds of “Name That Scale Degree”

Singing scale degrees with their resolution patterns teaches students to gauge not only the distance, but, more importantly, to feel the sensation of each tone’s relationship to tonic.⁷ We encourage students to inflect each resolution pattern with subtle differences in timing and dynamics to express these unique relationships. We also recommend that they gesture the expressive character of these patterns with their hands to engage the kinesthetic response. Students practice (often over several classes) until they are fluent at finding and singing any scale degree with its associated melodic figure. As they progress, they are asked to identify scale degrees at an increased rate.

When students have become fluent with this stage of the game, they can be challenged further. In a slightly more difficult version, students sing back scale degrees without their accompanying resolution patterns. For example, if the teacher requests $\hat{3}$, then students sing only that scale degree and not the melodic figure of a descending third. This strategy accelerates the pace and develops an instant recognition of a tone’s position in the tonal hierarchy. Students soon realize that some scale degrees are harder to identify

⁷ For an excellent explanation on the importance of training students to understand tonal function see Michael Rogers, *Teaching Approaches in Music Theory* (Carbondale: Southern Illinois University Press, 2004), and “Review of ‘To Doh or Not to Doh,’” *Journal of Music Theory Pedagogy* 14 (2000): 15-25.

than others. For example, $\hat{6}$ and $\hat{4}$ are more difficult to recognize than the tonic or the leading tone. Similarly, students might have trouble moving from $\hat{7}$ to $\hat{3}$. From this experience, they discover varying degrees of stability and instability and inherent harmonic implications among the tones of the tonal hierarchy. The goal is to reproduce rapidly any scale degree at random, accurately and in a steady tempo.

Thus far, students have identified pitches without notation. To incorporate notation, the teacher may now indicate the scale degree by pointing to it on the board (instead of reciting it). When the game is played in this manner, students begin to associate tonal functions with both aural and visual cues. This association is crucial, because reading music is not only about recognizing letter names on a page, but also comprehending tonal function and responding musically to that function while performing.⁸

In another variation of the game, the teacher asks students to identify scale degrees. The teacher plays a key-defining progression to establish tonic, followed by a single pitch. The student responds with the scale degree number or syllable. For example, the teacher plays the progression to define the key of C major, followed by the pitch G3; the students respond by singing "5" to indicate the fifth scale degree. Eventually, the teacher can increase the number of pitches identified in the exercise.

⁸ Michael Rogers so eloquently puts it, "The crux of sightsinging is not labeling systems per se (how to name the notes when singing), ... but rather hearing systems (The mental processing and organization of one's thinking to accurately "find" and, more importantly, "to feel" pitches while singing)." (Rogers 2000, 15). We have noticed students who practice this game perform with much greater awareness to scale degree function.

To this point we have focused on pitches near middle C; eventually we venture to more extreme registers. This often becomes a moment of revelation for students who marvel at their newly found ability to identify any scale degree within the span of several octaves. Focusing on scale degrees in extreme registers helps students to hear pitches outside the more limited range of their own instrument. This skill is particularly useful for those who are studying conducting, which requires the ability to recognize scale degrees quickly in any register.⁹ The goal is for students to identify scale degrees within any register without having the key-defining progression replayed.

"Name that Scale Degree" enables students to experience the full "personality" of tones in a more active, visceral manner compared to traditional dictation exercises. Students discover on their own the characteristics of tones as described by Zuckerkandl and other theorists.¹⁰ Students with perfect pitch initially may have difficulty perceiving the innate character of a tone because they are accustomed to identifying pitches only by name. This game compels students to learn the function of pitches. By function we mean the resolution tendencies of scale degrees, akin to what Zuckerkandl refers to as their "dynamic qualities."¹¹

"Name that Scale Degree" also fosters a student's ability to retain tonic. Inexperienced students require the repetition of the resolution pattern or key-defining progression to maintain a sense of tonic. As they gain experience, students identify a series of scale degrees without depending upon repetitions, because the point of reference (the tonic) is now internalized. Eventually, they learn to recognize scale degrees for extended periods of time. This game imprints a mental point of reference, a compass that positions them spatially within the tonal hierarchy.

⁹ The teacher also can play the key-defining progression followed by melodic and harmonic intervals, and ask students to sing the interval with scale-degrees followed by the name of the interval. For example, the teacher plays the progression, followed by melodic figure d-f. The students sing "2-4" or "re-fa" followed by the words "minor third." Intervals can be taught within and apart from tonal contexts. Our gaming approach is consistent with established pedagogical techniques insofar as it recognizes that identical intervals in different tonal contexts are perceived differently. After interval recognition, the focus shifts to the recognition of trichords. In the second semester we introduce all twelve pitches, a strategy that serves as an introduction to chromaticism.

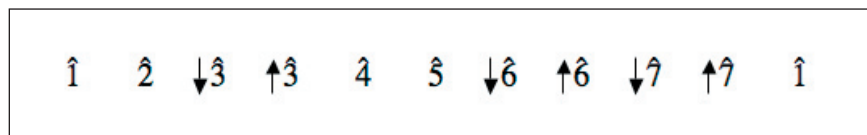
¹⁰ Victor Zuckerkandl, *Sound and Symbol*, trans. Willard R Trask (Princeton: Princeton University Press, 1973); Wallace Berry, *Structural Functions in Music* (Englewood Cliffs: Prentice-Hall, 1976); Arnold Schoenberg, *Harmonielehre* (Wien: Universal Edition, 2001, c1922).

¹¹ Zuckerkandl, *Sound and Symbol*, 11-31.

In summary, this game promotes two vital aspects of musicianship: 1) the ability to retain one's tonal bearings; and 2) the recognition of long-range melodic associations.¹² Playing the game facilitates an effective experience of tonic retention. In our gaming philosophy, we emphasize experience and instant reactions as key components because they promote skills through active learning.

2. Growing Melody

Our second game, "Growing Melody," develops the ability to remember pitches as scale-degrees more broadly within melodies and to transfer pitches from short- to long-term memory.¹³ The teacher begins by providing a list of scale degrees; Example 3 shows a possible collection. The arrows indicate raised and lowered inflections of scale degrees in the major and minor modes.¹⁴ A teacher can also choose a collection that emphasizes a new harmony or technique. For example, the collection in Example 3 features modal mixture. Similarly, a collection may emphasize $\sharp 4$ when students are first learning about modulation to the dominant.



Example 3: Collection of Scale Degrees for "Growing Melody"

¹² According to cognition studies, untrained listeners in particular are unaware of large-scale key relationships and have limited abilities to retain tonic. See Nicholas Cook, "The Perception of Large-Scale tonal Closure," *Music Perception* 5, 197-205; and Elizabeth Marvin and Alexander Brinkman, "The Effect of Modulation and Formal Manipulation on Perception of tonic Closure by Expert Listeners," *Music Perception* 16, 389-407. One of the benefits of this game is that it stretches students' perceptual capabilities and trains them to retain tonic over extended periods of time.

¹³ In contrast to "Name that Scale Degree," an exercise in which the location of scale degrees within the tonal hierarchy are illuminated through isolation, in our subsequent games students integrate their newly acquired scale degree knowledge into larger melodic contexts. We recommend that students begin this process immediately, so that they experience the way in which scale degrees react with one another in actual musical settings.

¹⁴ Showing chromatic inflections with arrows works better than using accidentals because arrows are generalized for any key.

The teacher establishes tonic and provides an opening incipit (usually 3-5 notes long), which all students sing on scale degrees. Each student then takes a turn singing the previous melodic incipit on a neutral syllable while adding an additional pitch.¹⁵ For example, the first player recites the opening incipit and adds a pitch. The next student recites the first player's melody plus an additional pitch. Play continues until everyone has added a pitch or until the majority of students can no longer remember the melody.

In the spirit of game playing, students contribute to the melody according to their own abilities. Students who struggle tend to repeat pitches, or provide stepwise connections, which can create boring, repetitive melodies. Following the students' responses, the teacher might invite constructive criticism of less musical melodies, encouraging discussion as to how they could be improved. On the other hand, more confident students may challenge their peers and show off by introducing difficult leaps, motivic repetitions, registral shifts, or deceptive resolutions of tendency tones.

A primary challenge of this game is the ability to retain a series of melodic pitches for an extended period of time. Students are encouraged to conceptualize each pitch as a scale degree, and to trace the course of the melody through the scale-degree diagram provided on the board (see Example 3). This sound-to-symbol conversion is one method of transferring pitches from short- to long-term memory. The teacher can help the memorization process by using the hand to outline the melodic contour with each repetition. For students who are not adept at quick conversion of pitches to scale degrees, contour can be an intermediary memory aid. Inevitably some students have trouble remembering the tune as it increases in length. When this happens, they may request a review of the melody from others in the class. At this point, it is useful to discuss the characteristics that make the melody hard to remember. Is there an awkward interval? Are there too many repeated notes? Is the melody uninteresting and without direction?

Not infrequently, students will sing a pitch that is not part of the game's collection. Instead of regarding these extraneous pitches as mistakes (as one would in a conventional dictation exercise), the instructor uses them as an opportunity for group identification and

¹⁵ The student sings on a neutral syllable so that the rest of the class remains engaged by determining scale degrees as tones are sung. We use this method in some of the other games described later in the article.

discussion. This process is one of the advantages of gaming versus dictation. In a dictation exercise, students work alone under pressure to arrive at the correct answer. In gaming, students work together while developing individual skills. Doing so creates a classroom atmosphere in which all responses, those expected and unexpected, are seen as an integral part of the learning process. One student's "mistake" provides an opportunity for everyone to benefit.

This game increases a student's ability to remember longer melodies. According to George Miller's seminal article, an average person can retain five to nine discrete items in short-term memory.¹⁶ To remember longer melodies, students must learn to group patterns of pitches. Conceptualization of a melody in terms of scale degrees encourages students to group pitches according to tonal functions.¹⁷ After each student has sung in turn, or memory has failed him or her, the class sings the melody with scale degrees and then notates it.

At this point it can be helpful to analyze the finished tune, which provides an opportunity to remark on ways in which the melody follows or challenges tonal conventions. For example, are there melodic continuations that are contrary to normative resolution patterns? (Is there an interval of an augmented-second between $\hat{7}$ and $\hat{6}$, or a lowered $\hat{7}$ moving up to $\hat{1}$?) Are there multiple highpoints? Are there motivic relationships?¹⁸ This activity allows students to gain valuable insights about processing melodic events. For instance, students recognize that stepwise motion is easy to sing and can promote direction, whereas leaps produce melodic tension, harmonic implications, and registral shifts. In addition, they learn to perceive melodies not merely as a consecutive string of individual pitches, but as building blocks of melodic figures—arpeggiations, neighboring figures, and decorative chromatics. As

¹⁶ George Miller, "The Magical Number Seven, Plus or Minus 2: Some Limits on Our Capacity for Processing Information," *Psychological Review* 63 (1956): 81-97.

¹⁷ See Karpinski's discussion on the benefits of chunking, which he explains not only develops melodic memory, but teaches listeners to think "analytically, functionally, and structurally." Gary S. Karpinski, *Aural Skills Acquisition: The Development of Listening, Reading, and Performing Skills in College-Level Musicians* (New York: Oxford University Press, 2000), 73-77. Potter also discovered that successful dictation takers used chunking as a strategy to remember melodies. Gary Potter, "Identifying Successful Dictation Strategies," *Journal of Music Theory Pedagogy* 4 (1990): 63-71.

¹⁸ For comparison purposes, the nonconventional resolutions could be substituted with more conventional ones. We also recommend adding expressive marks to the melody. Students could also add an accompanying bass line or harmonic progression.

students gain experience, the teacher can set more parameters for the melody, such as requiring scale degrees that invoke a particular chromatic harmony, or motivic parallelisms between antecedent and consequent phrases. With guidance, students can become more adept at improvising musically well-crafted melodies involving motivic relationships, harmonic structure, and overall shape and balance.¹⁹

SECTION II: GAMES THAT FOCUS ON MODULATION

Modulation is one of the more elusive concepts for students to grasp aurally. Students usually understand the written concept for modulation long before they can produce a melody that modulates. In our classes, we focus on two main strategies for hearing modulations. The first involves the comparison of beginning and ending tonics. The skills involved include: 1) the retention of tonic during key change interference, and 2) the determination of the interval between old and new tonics. In general, this method emphasizes a fixed-do, or an absolute pitch system.

The second strategy focuses on how absolute pitches change function in the process of modulating from one key to another. For example, the leading tone in the home key becomes stable $\hat{3}$ in the dominant key; this process of functional transformation explains pivot events and applies also to chromatic alterations. In contrast to the first strategy, this technique emphasizes a moveable-do or relative pitch system. Whereas the first strategy facilitates nonadjacent, long-term memory associations, the second develops moment-to-moment processing of events. We present two games that promote both strategies of hearing and interpreting modulations.

3. One-Note Wonder

The game “One-Note Wonder” focuses on modulation through a pivot pitch. The teacher provides a “wondrous” pitch that, over the course of the game, will be interpreted randomly as one of the seven possible scale-degrees ($\hat{1}$, $\hat{2}$, $\hat{3}$, $\hat{4}$, $\hat{5}$, $\hat{6}$, $\hat{7}$). The first student randomly assigns any scale degree to the “wondrous” pitch, thus establishing its function in the tonal hierarchy. Then, the student sings the pitch in the resolution pattern (See Example 1) for that scale degree and

¹⁹ This game can also be useful for teaching atonal melodies.

concludes with a short melodic figure that confirms the new tonic. For instance, if the wondrous pitch is G⁴, the student may choose to hear and sing it as $\hat{5}$ (Example 4a), meaning that G now functions as the dominant of C major; the melodic continuation (which is improvised) confirms the new tonic.

Example 4: "One-Note Wonder"

The next student may choose $\hat{7}$ (Example 4b), in which G now functions as the leading tone of A-flat major. As students sing and interpret the "wondrous pitch" in turn, they hear the diverse keys within which a single pitch can function. Example 5 indicates the keys and some of the possible responses for any given pitch (Example 5 assumes G as the starting tone).

A Major-mode keys that use the given pitch

G major F major Eb Major D major

C major Bb major Ab major

B Minor-mode keys that use the given pitch

G minor F minor E minor D minor

C minor B minor A minor

C Some chromatic pivots

Db Major F# minor

Example 5: Possible Keys for a Given Pitch (G as the starting tone)

When first playing the game, it is useful to have students interpret the wondrous pitch as one of the possible scale degrees in a major scale (Example 5a). Then the same process is repeated with the wondrous pitch functioning as a scale degree in a minor scale (Example 5b). The next step allows students to interpret the “wondrous pitch” in either the major or minor scale. More advanced students can interpret the given pitch not as a diatonic tone, but as a chromatic inflection (Example 5c). This game teaches modulation through a pivot pitch, as students learn to adjust quickly to the change of scale-degree function involved in moving from one key to another. This exercise also heightens an awareness of the half step and whole step relationships within the major and minor scales.

4. Tonal Gateways

Compared to “One-Note Wonder,” which focuses on identifying pivot tones, “Tonal Gateways” models (in three steps) the entire process of moving from one key to another. We make the allusion to a “gateway” because a pivot tone can suggest various tonal goals or paths. Through a process of cooperative learning students learn to compose and recognize modulating melodies.

Composing Modulating Melodies

The object is to compose a melody that modulates to a new key using the three steps underlying most modulations:

- 1) Establish the home key.
- 2) Determine a “tonal gateway” that leads to the new key.
- 3) Establish the new key.

The teacher asks a student to choose a clef, meter, starting key and a final key. The instructor then labels three broad areas on the board that correspond to the modulatory process outlined above. The teacher directs individual students to improvise a short melodic pattern (on a neutral syllable) to establish the home key, the new key, and the modulatory “tonal gateway.”²⁰ Each step usually comprises two or three measures. The entire class then sings back the improvised pattern for each step using scale-degrees, after which the teacher or student writes the improvised pattern in the appropriate area indicated on the board.

Students soon realize that some patterns work better than others as modulatory idioms: an arpeggiation of the tonic triad often works best to establish the home key; the introduction of the new leading tone serves as part of the gateway that leads from the tonic; a concluding melodic pattern (3-2-1-2-1) establishes the new key through a cadential idiom. Through trial and error students discover, for example, which scale degrees are necessary for modulation and the considerations of pacing and rhythm that provide a smooth and logical modulation.

²⁰ The student uses a neutral syllable so that the rest of the class remains active by determining the scale degrees of the melody as they hear it.

Identifying Modulating Melodies

After understanding the process of modulation through group composition, students are ready to identify aurally modulating melodies. This activity reverses the process so that, instead of composing modulating melodies, students must hear and recognize them.

The teacher begins by playing a modulating melody and asks students to remember the original tonic. When the melody is finished, students sing the new tonic followed by the old tonic, which enables them to determine whether the new key is either closely- or distantly-related to the home key. Using short melodies facilitates this comparison because the two tonics are temporally proximate. More advanced students can be challenged with longer melodies.²¹

Next, students explain the modulation in terms of its three phases by answering the following questions. Which part establishes the first tonic? Which confirms the new tonic? Where does the pivot occur and what pitches have been altered to establish the new key? To answer these questions, students must rely on both aural and theoretical knowledge.

After students determine the three phases, the teacher presents a new melody that begins like the first, but modulates to a different key. In other words, the home key region remains the same, but the tonal gateway and new key differ. Hearing tonal gateways to different keys teaches students to differentiate between close and distant relationships. In short, comparing brief modulating melodies helps students determine different stages of a modulation and the structural relationships between keys.

SECTION III: GAMES THAT FOCUS ON PHRASE STRUCTURE

Whereas the previous two sections describe games that focus on scale degree function, tonic retention, and aspects of melody and modulation, we now present games that address the formal issue of phrase structure.²²

²¹ Klonoski also offers some excellent distraction exercises to help students retain tonic in the midst of a key change. See Edward Klonoski, "Teaching Pitch Internalization Processes," *Journal of Music Theory Pedagogy* 12 (1998): 81-96.

²² We use William Caplin's terminology to describe phrase structure. See *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart, and Beethoven* (New York: Oxford University Press, 1998), 9-12, 35-70.

5. Measure-by-Measure

In “Measure-By-Measure” each student improvises a melodic fragment that can function logically within a given phrase structure such as a period or a sentence. The goal is to teach students about phrase structures by improvising them. The teacher begins with a diagram of a phrase that serves as the basis of the exercise, such as the compound period shown in Example 6a.²³ The teacher then provides the class with the basic idea (bi) of the antecedent phrase (Example 6b). Students are asked to improvise a melodic fragment that is part of the given model. Each student takes a turn

A

B beginning incipit provided by teacher

C transcription of a game

Example 6: “Measure by Measure”

²³ A compound period is a formation in which both the antecedent and the consequent phrases are themselves sentences. See Caplin, *Classical Form*, 65-68.

improvising two measures on a neutral syllable until the form (in this case, a compound period) is completed.

In "Measure-by-Measure," students do not repeat the melody from the beginning (as in "Growing Melody"), but instead improvise a melodic pattern continuing from the one improvised by the previous student. Example 6c shows a transcription of a game performed by students who had never played "Measure-By-Measure." In this case they were able to create an antecedent phrase ending with a half cadence, followed by a parallel consequent phrase concluding with a perfect authentic cadence. Improvisation, therefore, leads them to consider not only the scale-degree functions of their melody, but also the harmonic implications of their choices. A student, for instance, must choose $\hat{5}$, $\hat{7}$, or $\hat{2}$ as the ending pitch of the first phrase, tones that imply dominant harmony. In addition, students must keep track of how their pattern functions in the overall phrase structure. The fourth student, therefore, had to reiterate the opening basic idea in m. 9 to create the beginning of a parallel consequent in a 16-bar parallel period (Example 6c).

When the entire phrase structure is completed, the class sings the resultant melody with scale degrees. In order to sing the entire period, students need to memorize the phrases as they are improvised. After playing the game several times, students notice that certain parts of the formal structure are easier to remember than others. For instance, beginnings and endings of phrases are easier to recall than the middle measures.²⁴ The continuations in mm. 5 and 13, for instance, are more difficult to remember than phrase beginnings. This realization results in a discussion about how memory works. At first, students may assume that memory is linear—an assumption reinforced by traditional dictation methods, which involve notating a series of successive events. In playing this game students not only learn to recognize and develop nonlinear memory skills, they also become sensitive to the ways in which they memorize. Armed with this knowledge, students can focus attention on the parts of the phrase that are hardest to remember—in this case, the middle.

²⁴ Psychological literature refers to this phenomenon as the "primacy" and "recency" effects. For the effects of this phenomenon in music, see Linda A. Roberts, "Modality and Suffix Effects in Memory for Melodic and Harmonic Musical Materials," *Cognitive Psychology* 18 (1986): 123-57.

After singing the phrase on scale degrees, most students internalize the information required for notation. In other words, they determine the scale degrees, commit the melody to long-term memory, and conceptualize the melody in terms of its phrase structure. The teacher can vary the game by asking students to notate the melody in another key or clef. In traditional dictation, students tend to rush to the notation phase, assuming that they have to fill a blank sheet of paper. Unfortunately, such focus on notation eliminates several cognitive processes.²⁵ When students begin with the notation phase, omitting these intermediate steps, they often conceptualize melodies as successions of intervals, leading to the familiar “off-by-one” mistake. “Measure-By Measure” encourages a mental processing of a melody based on tonal functions and phrase structure, not on interval successions.²⁶

²⁵ Karpinski, *Aural Skills Acquisition*, 62-64.

²⁶ One could use some of these suggested strategies, with traditional dictation exercises as well, to avoid the “just-get-the-notes-down” approach. See Karpinski, *Aural Skills Acquisition*, 82-88, and Rogers, *Teaching Approaches*, 100-119. Both of the foregoing authors voice deep concerns about a merely perceptual, versus analytical, approach to dictation.

6. The Terminator

Our final game, “The Terminator,” teaches phrase structure through group improvisation. Students are asked to “terminate” a period form by improvising a consequent phrase to a provided antecedent. To set the stage for the game, the teacher plays the antecedent phrase of a parallel period. Example 7 shows the beginning of Haydn’s, Piano Sonata No. 44.²⁷

A Antecedent provided by teacher
Haydn, Sonata No. 44 in G minor, Hob. XVI, mvt. 1, mm. 1-2

B Structural pitches and cadence of the antecedent phrase

G minor: HC

C An improvised consequent phrase

G minor: PAC

D Another improvised consequent phrase

Bb Major: PAC

E Haydn's consequent (Sonata No. 44, mvt. 1, mm. 3-4)

G minor: PAC

Example 7: “The Terminator”

²⁷ This game works best if the students are unfamiliar with the given antecedent.

First, students memorize the phrase, and sing it on a neutral syllable. Next, students analyze the phrase in small groups, identifying structural pitches and the cadence. To confirm the group analysis, the class is asked to sing only the structural pitches of the phrase on scale degrees, as shown in 7b. Ideally, all of these tasks can be done aurally; if necessary, however, they can consult a notated version provided by the instructor.

The real fun begins when the teacher calls on a student to finish the parallel period. The class sings the opening measures of the antecedent, with or without variation; then a student improvises a consequent phrase ending with a perfect authentic cadence. Two improvised consequents are shown in Examples 7c and 7d. For each round of the game, the entire class sings the antecedent, and then a student improvises a consequent. After several turns, the teacher plays the composer's consequent (Example 7e) and facilitates a discussion comparing the different versions. For instance, a teacher may point out Haydn's use of the higher register, asking students to comment upon its effects on the shape of the phrase.

As shown in the transcriptions of student responses, one participant improvised a consequent that modulated (Example 7d). This could lead to a discussion on the comparative effects of modulating versus non-modulating periods. Interestingly, students sometimes prefer their own improvisations to that of the composer, and are keen to explain why their version is best! Although we've used a simple example to introduce the game, it is also effective to choose a more complicated period featuring cadential expansion, phrase overlap, or truncation. Through the process of comparison, these compositional processes inspire interesting discussions about normative phrase structure, expectations that are thwarted, transformed, or deferred, as well as symmetry. It is also advantageous to identify aspects of a phrase that are typical of a particular style, time, or composer.

In summary, "The Terminator" promotes an awareness of phrase structure by engaging students in the creative process itself. Students contribute at their own levels and develop an enriched analytical understanding based on the creative input of their peers.

CONCLUSION

At the beginning of this article we maintained that traditional dictation had disadvantages that presented problems in the aural skills classroom. Our experience reveals to us that game playing offers solutions to these problems and addresses far-reaching aspects of cognitive and aural learning in the aural skills classroom. The methods of these games are versatile, making them applicable to various teaching styles and situations. Game playing encourages an interactive classroom—students work at their own pace, learning from each others' ideas and mistakes in a stimulating, cooperative atmosphere that builds confidence. While the approach is intended to be fun, in some cases even funny, we have observed that students learn from this approach that aural skills are essential to good musicianship, and not just a game.

APPENDIX A: ACTIVE LEARNING LITERATURE

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APPENDIX B: SUMMARY OF THE GAMES

The Game	Aural Skills That the Game Promotes
Name That Scale Degree	Relative pitch, sensitivity to scale-degree function, tonic retention
Growing Melody	Scale-degree function in a melodic context, transfer of pitches from short- to long-term memory, concentration, notation
One-Note Wonder	Modulation through a pivot event, awareness of the numerous keys to which a pitch belongs
Tonal Gateways	Modulation in three phases, retention of tonic during key change interference, non-adjacent memory associations, awareness of the structural relationships between different keys
Measure by Measure	Structural understanding of phrase structure, sensitivity to scale-degree and harmonic function, long-term memory notation
The Terminator	Structural and stylistic understanding of phrase structure, sensitivity to scale-degree and harmonic function, long-term memory notation





Sound Experiments: The Use of Four-Voice Writing in the Study of Twentieth-Century Music

Mark Sallmen

“One who cannot control four parts with a certain ability either has not worked seriously or is entirely untalented and should give up music at once.”

—Arnold Schoenberg¹

Four-voice writing exercises saturate music theory textbooks devoted to the common practice but play only a minor role in recent texts on the twentieth century.² Intrigued by this dichotomy, I have gradually been incorporating more four-voice exercises into the twentieth-century portion of the core music theory course that I teach. I have found that the use of homophonic musical models *throughout* the undergraduate curriculum promotes continuity, thereby helping to connect the twentieth-century repertoire to its stylistic antecedents. The exercises also provide material

¹ Arnold Schoenberg, *Structural Functions of Harmony*, ed. Leonard Stein (New York: Norton, 1969): xvi. Although the book focuses primarily on harmony in common-practice tonal music, it concludes with a few comments concerning quartal and whole-tone harmony.

² Using two popular texts as representative examples, Edward Aldwell and Carl Schachter's *Harmony and Voice Leading* (New York: Harcourt, 2003) contains several hundred part-writing exercises, while Stefan Kostka's *Materials and Techniques of Twentieth-Century Music*, 2nd ed. (Upper Saddle River: Prentice-Hall, 1999) contains less than ten. I hasten to add that Kostka's text contains many other useful assignments, such as composition exercises that require students to continue a given opening, to imitate an existing excerpt, and to illustrate various theoretical constructs. For various types of exercises that address twentieth-century harmonic materials see John Rahn, *Basic Atonal Theory* (New York: Longman, 1980); Joel Lester, *Analytic Approaches to Twentieth-Century Music* (New York: Norton, 1989); J. Kent Williams, *Theories and Analyses of Twentieth-Century Music* (New York: Harcourt Brace College Publishers, 1997); Joseph N. Straus, *Introduction to Post-Tonal Music* (Upper Saddle River: Prentice Hall, 2005); and portions of Roger Sessions, *Harmonic Practice* (New York: Harcourt, 1951) and Evan Copley, *Harmony: Baroque to Contemporary* (Champaign: Stipes, 1991). Two older compositionally-oriented texts provide a plentiful supply of composition exercises, some of which suggest homophonic texture: Vincent Persichetti, *Twentieth-Century Harmony: Creative Aspects and Practice* (New York: Norton, 1961) and Ludmila Ulehla, *Contemporary Harmony: Romanticism through the Twelve-Tone Row* (New York: The Free Press, 1966). These books remain wonderful resources because they discuss harmony in considerable depth.

for classroom singing, which helps students to connect aural experience to music-theoretic concepts. Further, students gain skill in the manipulation of the materials of extended tonal and atonal harmony, which improves analytic ability and prepares for composition.

In addition to engaging the harmonic phenomena associated with the extended tonal and atonal repertoires, these experiments also encourage consideration of motivic repetition. The assignments limit student's choices by providing one or more of the voices, by requesting particular chord/collection types, and/or by requiring certain root motions or other features. In addition to limitations imposed by the instructor, students must invent their own, ever striving for a self-inspired maximum. My goal is to give them more freedom—not the freedom to have *no* rules—but rather to choose at least some of *their own*.

I call these four-voice exercises “sound experiments.” The term “sound” has a double meaning, implying not only the connection to live musical experience but also the historical foundation on which the exercises are based. The term “experiment” encourages creativity and exploration. Since sound experiments mix harmonic phenomena suggested by the musical repertory with teacher-imposed notions and ideas from the student, they are neither style-emulation exercises nor free compositions, but rather abstract exercises that inhabit the middle ground between these two extremes. However, as shown later in the paper, sound experiments can lead to the emulation of existing styles and to the creation of original compositions.

The list in Ex. 1 augments the familiar four-voice issues of the common practice with techniques introduced in the twentieth century. Since there are so many ways to address and combine various musical concepts, even this small set of topics promotes great variety in student responses to a given assignment. Although the list is largely self-explanatory, it will be helpful to review labeling procedures for intervals, chords, collections, and motives as a preparation for the main body of the paper, which discusses sample sound experiments.

1. Intervals: specific, generic, step vs. leap, contour, pitch-class interval, interval class, etc.
2. Chords: (a) tertian: triads (major, minor, diminished, augmented, Italian), seventh chords (major, minor, dominant, half diminished, diminished, dominant with raised fifth, French, German, diminished-major, minor-major, augmented-major), extensions (b9, 9, #9, 11, #11, b13, 13) (b) quintal harmony, (c) set types ([014], etc.)
3. Scales: major, minor (natural, harmonic, melodic), pentatonic, octatonic, whole tone, acoustic, etc.
4. Modes: of diatonic collection (Ionian, Dorian, etc.), of pentatonic and other collections
5. Spatial layout: spacing (close, neutral, open), distance between adjacent notes, total span, chord inversion, chord member in soprano, one chord member above another, etc.
6. Chord progression: plagal, authentic, passing, neighbor, interval between roots, sequential, etc.
7. Common tones between chords/collections
8. Non-harmonic tones: neighbor, passing, pedal, etc.
9. Closure: cadence, statement-departure-return, aggregate completion, etc.
10. Motivic transformation: augmentation, diminution, transposition, inversion, retrograde, rotation, tonal vs. real imitation, fragmentation, ornamentation
11. Motivic repetition: within one voice, between/ among voices, stretto, canon, sequence, ostinato, etc.
12. Relationship of voices: contrary/ similar/ parallel/ oblique motion, voice overlap, voice crossing, voice exchange, voice pairing
13. Melodic shape: arch, inverted arch, zigzag, straight, meandering downwards, etc.
14. Meter/ Rhythm: measure, beat, strong/ weak beats, onbeat/ offbeat, syncopation, hemiola, duration, harmonic rhythm, etc.
15. Miscellaneous concepts: cross relation, modulation, pivot chord, modal mixture, resolution of dissonant chord members, change melodic direction after a large leap, consonance vs. dissonance, subset/ superset, set-type similarity, etc.
16. Treatment of issues: number to be balanced simultaneously, issue priority in case of conflict, strict vs. flexible application of rules

Example 1: Some Four-Voice Writing Issues

TERMINOLOGY

In tonal and extended tonal contexts, musicians identify pitch intervals either specifically (e.g. “major third”), generically (e.g. “third”), or in terms of a step/leap dichotomy. Interval descriptions may also specify direction, as in “descending major third,” “ascending third,” or “descending leap.” Contour intervals

(a) Interval types

Specific:	major third (M3)	minor seventh (m7)
Generic:	third	seventh
Step/leap:	leap	leap
Contour:	descending (↓)	ascending (↑)
Pitch-class:	8	10
Interval class:	4	2

(b) Tertian

Chord: CM F#m7 E7(#11) FM(add9)

Root motion: tritone ↓m3 ↑M2

(c) Quintal

D quintal C# quintal

↓m2

(d) Collections

D acoustic F acoustic

↑m3

(e) Atonal set types

[014]↑_{F#} T2 [014]↑_{G#} [016]↓_{Gb} T9 [016]↓_{Eb}

Example 2: Some analytic terminology.

indicate direction but not size (“ascending” or “descending”). In atonal contexts it is vital to consider other interval types as well. Given the pitch-class clock (C at 12 o’clock, C $\sharp$ /D $\flat$ at 1, D at 2, etc.), a *pitch-class interval* measures the numerical distance in a clockwise direction from one pitch class to another. For example, from A (9 o’clock) to F (5 o’clock) is pitch-class interval 8. An *interval class* counts the shortest distance between two pitch classes; for instance, A and F are interval class 4 apart. Ex. 2(a) summarizes these various interval types.

The remainder of Ex. 2 introduces notational conventions for chords and collections, and shows ways to indicate root motion and transposition. Tertian harmony is familiar. When a tonal center is present, roman numerals and figured bass describe the harmony, otherwise chord labels list root, quality, and extensions, as shown in Ex. 2(b). With quintal harmony, I choose the “bottom” note in a stack of fifths to be referential, even if it isn’t literally in the bass; as with the four-note quintal chords on D (D–A–E–B) and C $\sharp$ (C $\sharp$ –G $\sharp$ –D $\sharp$ –A $\sharp$) in Ex. 2(c).³ Taken as a pair, the D and C $\sharp$ quintal collections articulate transposition by descending minor second. Larger collections may be treated in a similar fashion, as with the minor-third related acoustic collections in Ex. 2(d).

In atonal harmony, students determine pitch-class set labels by plotting a set’s pitch classes on the clock and then determining the prime form as follows:

Find the widest gap between the pitch classes. Assign zero to the note at the end of the gap and read off a possible prime form clockwise. Then assign zero to the note at the beginning of the gap and read off another possible prime form counterclockwise. (If there are two gaps of the same size, choose the one that has another relatively big gap right next to it.) Whichever of these potential prime forms has fewer big integers is the true prime form.⁴

³ The referential pitch class facilitates the study of transposition among quintal harmonies but it is not strictly speaking a “root.” In *The Craft of Musical Composition, Book I, Theoretical Part*, trans. Arthur Mendel (New York: Associated Music Publishers, Inc., 1942, rev. 2/1948), Paul Hindemith writes: “the chord composed of two superimposed fourths...[has] no root, but only a root representative” because “the interpretation depends on the context.” (101)

⁴ Straus, *Introduction*: 58. Straus also lays out a method for determining prime forms that does not use a pitch-class clockface.

The complete *pcset label* is this *prime form*, along with the *direction* traveled to determine the prime form ($\uparrow$ for clockwise, $\downarrow$ for counterclockwise) and the *starting pitch class*. For example, the label for $\{F\sharp GB\flat\}$ is $[014]\uparrow_{F\sharp}$ because counting clockwise from $F\sharp$ yields prime form $[014]$ —that is, $F\sharp-G-A-B\flat$ yields zero-one-two-three-four, as in Ex. 2(e).⁵ Similarly, $\{G\sharp AC\} = [014]\uparrow_{G\sharp}$. In the same manner, $[016]\downarrow_{G\flat}$ describes $\{G\flat FC\}$ because counting counterclockwise from $G\flat$ yields prime form $[016]$ —that is, $G\flat-F-E-E\flat-D-D\flat-C$ yields zero-one-two-three-four-five-six. Likewise, $\{E\flat DA\} = [016]\downarrow_{E\flat}$.⁶ Example 2(e) also identifies transpositional relationships between these sets; the $[014]\uparrow$ articulate T2, transposition by pitch-class interval 2, and the $[016]\downarrow$ articulate T9.⁷

As with unordered sets, labels for *ordered sets* (also called rows, segments or motives) include type, orientation, and referential pitch class. An upper case letter such as X denotes a set of ordered sets related by transposition, inversion, and/or retrograde; P, I, RP, and RI specify orientation (prime, inversion, retrograde-prime, retrograde-inversion); and a subscript indicates the initial pc for P and I forms and the final pc for RP and RI forms. For example,

⁵ This notational system was laid out in an earlier article of mine, "No Simple Pieces: Curricular Coherence, Classroom Vocalization, Row Combination, and the 'Trio' from Schoenberg's *Suite for Piano*, Opus 25," *Journal of Music Theory Pedagogy* 15 (2001): 1–49. Although prime forms saturate the pedagogical sources, many texts do not specify orientation and/or referential pc, although some, using different notational conventions, indicate a pcset's relationship to the set-class prime form. For example, this article's $[014]\uparrow_{F\sharp}$ corresponds in some ways to $T_6\{0,1,4\}$ in Rahn, *Basic Atonal Theory*. I use $\uparrow$ and $\downarrow$ for pcset orientation, thereby keeping the symbols T_n and T_nI out of pcset labels, so that students clearly understand the difference between a pcset label and a transformation. I use letter names for pcs in the core curriculum course because they facilitate a quick and smooth transition from tonal to atonal theory, thereby increasing the amount of time left to study *the music*. Many other texts use integer representation of pcs, which has its own advantages, especially in more advanced situations. In "Recommendations for Atonal Music Pedagogy in General; Recognizing and Hearing Set-Classes in Particular," *Journal of Music Theory Pedagogy* 8 (1994): 75–134, Robert Morris argues for pc integers instead of letter names and provides an illuminating discussion of this and other pertinent issues. Of course, the four-voice exercises outlined below may be adapted to suit any notational system.

⁶ When symmetry is involved, there are multiple starting points and/or directions, as for example with $\{CD\flat F\sharp G\}$, which can be labeled $[0167]\uparrow_C$, $[0167]\uparrow_{F\sharp}$, $[0167]\downarrow_{D\flat}$, $[0167]\downarrow_{G\flat}$, or even $[0167]\uparrow_C\uparrow_{F\sharp}\downarrow_{D\flat}\downarrow_{G\flat}$. The idea of multiple possible labels for a single set of pitch classes is familiar to students acquainted with the enharmonic respelling of a diminished seventh chord (e.g. $C^\flat7$, $D^\flat7$, $F^\flat7$ and $A^\flat7$).

⁷ When pcsets have the same prime form but different orientations, they are related by T_nI , where n is the sum of the clock positions of the referential pcs. E.g. $[016]\uparrow_F$ and $[016]\downarrow_{D\flat}$ are related by T_6I because $5(F) + 1(D^\flat) = 6$.

⁸ Once again the pedagogical literature includes various notational conventions; for example $RI(X)_C$ might also be labeled RT_0IP (after Morris, "Recommendations"), $RI-0$ (Kostka, *Materials and Techniques*), or RI_0 (Straus, *Introduction* and Williams, *Theories and*

if $P(X)_C = \underline{C}-D-E\flat-B-G$, then $RP(X)_C = G-B-E\flat-D-\underline{C}$, $P(X)_F = \underline{F}-G-A\flat-E-C$, $I(X)_C = \underline{C}-B\flat-A-D\flat-F$, and $RI(X)_C = F-D\flat-A-B\flat-\underline{C}$.⁸ r_n indicates rotation-by- n order positions as with $r_1P(X)_F = C-\underline{F}-G-A\flat-E$, $r_2I(X)_C = D\flat-F-\underline{C}-B\flat-A$, and $r_4RI(X)_C = D\flat-A-B\flat-\underline{C}-F$. Order position numbers specify motivic fragments, as in $P(X)_{C(1-4)} = C-D-E\flat-B$ or $P(X)_{C(1-2,4-5)} = C-D-B-G$. When only one ordered set type is of interest in a particular context, as is often the case in the analysis of a twelve-tone piece, the label omits the capital letter, as with P_C , RP_C , P_F , I_C , RI_C , and r_1P_F . Or, if a situation involves R and T_n , but not I , then the P and I indications are unnecessary, yielding X_C , RX_C , X_F , and so forth.

In tonal and extended tonal contexts, motives are often subjected to “tonal” alteration, either to fit within a single scalar environment or to accommodate varying ones. For example, given $P_C = C-D-E\flat-B-G$ and a prevailing C harmonic minor scale, transformed versions such as $P_D = D-E\flat-F-C-A\flat$, $I_B = B-A\flat-G-C-E\flat$, and $RP_B = F-A\flat-D-C-B$ change at least some of the intervallic qualities of the original (e.g. from a major second to a minor second or augmented second). Concerning motivic repetition in multiple scalar settings, possible altered versions of $P_C = C-D-E\flat-B-G$ include $C-D-E-B\flat-G\sharp$ (whole-tone), $C-D-E\flat-B-G\sharp$ (octatonic), $C-D-E-B-G$ (C major), or even $C-D-E-A-G$ (pentatonic).

Overall, in addition to facilitating the study of harmony, motive, root progression, and transpositional relations in a variety of musical situations, this labeling system promotes curricular continuity. For example, a single motivic labeling method applies equally well, with only minimal alterations, to the music of Bach, Britten, and Babbitt. Also, the use of a letter name (instead of an integer) to indicate a pcset’s referential pitch class helps to relate atonal to tonal practice.⁹ Finally, the presence of referential pitch classes in harmonic *and* motivic labels, in both tonal *and* atonal contexts, promotes a coherent overall view of these analytic resources.

⁹ The referential pitch classes in pcset labels provide a useful analogy to chordal roots in tonal music, but not all associated concepts transfer in a meaningful way. For example, a discussion of voice-leading tendencies in tonal music may usefully identify root motion by ascending second in both $vii^{07}-i$ and iv^7-V , despite the *varying* chord types, but in atonal contexts T_n/T_n relations may only be asserted between pcsets of the same type. Furthermore, chordal roots usually connote acoustic primacy, whereas set label’s referential pcs do not. Nonetheless, referential pitch classes are powerful aids to the study of T_n/T_n relations.

(a)

(b) Transformations of Melody 1

PC = C-D-E♭-B-G-B♭-A-A♭	IC = C-B♭-A-D♭-F-D-D♭-E
PC♯ = C♯-D♯-E-C-G♯-B-B♭-A	IC♯ = C♯-B-A♯-D-F♯-D♯-E-F
PD = D-E-F-C♯-A-C-B-B♭	ID = D-C-B-E♭-G-E-F-G♭
PE♭ = E♭-F-G♭-D-B♭-D♭-C-B	IE♭ = E♭-D♭-C-E-A♭-F-F♯-G
PE = E-F♯-G-D♯-B-D-C♯-C	IE = E-D-C♯-F-A-F♯-G-G♯
PF = F-G-A♭-E-C-E♭-D-C♯	IF = F-E♭-D-F♯-B♭-G-A♭-A
PF♯ = F♯-G♯-A-F-C♯-E-D♯-D	IF♯ = F♯-E-D♯-G-B-G♯-A-B♭
PG = G-A-B♭-F♯-D-F-E-E♭	IG = G-F-E-G♯-C-A-B♭-B
PA♭ = A♭-B♭-C♭-G-E♭-G♭-F-E	IA♭ = A♭-G♭-F-A-D♭-B♭-B-C
PA = A-B-C-G♯-E-G-F♯-F	IA = A-G-F♯-B♭-D-B-C-C♯
PB♭ = B♭-C-D♭-A-F-A♭-G-G♭	IB♭ = B♭-A♭-G-B-E♭-C-C♯-D
PB = B-C♯-D-B♭-F♯-A-G♯-G	IB = B-A-G♯-C-E-C♯-D-E♭

Example 3: Melodies to be harmonized.

SOUND EXPERIMENTS

Like their tonal counterparts, sound experiment exercises come in various types. Students may be required to harmonize a given melody, to continue a given opening, or to create a progression with certain required features *ex nihilo*. This article focuses on melody harmonization, in particular, multiple settings of the melodies shown in Ex. 3(a); Melody 1 is harmonized with poly-triads, minor seventh chords, extended tertian sonorities, pentatonic collections, [016] and [0147], and Melody 2 receives a range of modal and bi-modal treatments. Example 3(b) lists the various P and I versions of Melody 1, from which can also be inferred retrogrades and rotations. Students fill in this chart early in the semester and refer to it later as they incorporate complete and incomplete forms into their various settings of Melody 1. Most of the solutions provided below are actual student responses although I have adapted / created some to illustrate certain points.

Provide a six-voice harmonization of the melody. The top three voices form a MAJOR triad and the bottom three voices form another MAJOR triad. The roots should differ by some consistent interval. For octatonic sounds choose either minor third (e.g. CM/E♭M or CM/AM) or tritone (e.g. CM/F♯M). For diatonic sounds choose a whole tone (e.g. CM/B♭M or CM/DM) or perfect fourth (e.g. CM/FM or CM/GM). Provide analysis and explain your choices.

Upper: A♭ B♭ C♭ G E♭ G♭ F E

Lower: B♭ ∅ ∅ A F A♭ G G♭

Lower: G♭ A♭ A F ∅ E E♭ ∅

I didn't really know where to start so I did parallel 6/4 chords in the upper voices, then I wrote down the possibilities for left-hand chords. To make choices I tried to reuse chords whenever possible, giving a voice exchange at the beginning, the double voice exchange at the end, and the held over chords in the middle.

Example 4: Poly-triadic harmonization of Melody 1.

Ex. 4 provides a sample sound experiment assignment with a typical student solution. The solution adheres to the given directions, contains no technical errors, and includes additional interesting features such as the voice exchanges and held over chords. Further, it provides clear harmonic analysis and gives a reasonable account of compositional process.¹⁰ As graded assignments are returned, I direct classroom vocal performance of several such answers to engrain the poly-triadic diatonic/octatonic sounds into students' aural memories. I also point out additional (positive) features not mentioned by the student description. In this case for example, the lower voices emphasize 6/4 spacing, although not quite as extensively as the upper ones do, and the bass voice moves primarily in descending stepwise motion, which when chromatic at C♯–C–B foreshadows the end of the given soprano line. Further, each six-note chord articulates

¹⁰ The short prose explanations help students learn to explain musical concepts and teachers to better evaluate student work. For an extensive discussion of the role of prose writing in music theory curricula consult Bruce C. Kelley, "Part-Writing, Prose Writing: An Investigation of Writing-to-Learn in the Music Theory Class," *Journal of Music Theory Pedagogy* 13 (1999): 65-88.

an incomplete diatonic collection; for example, major triads on A $\flat$ and B $\flat$ combine to articulate an incomplete E-flat major collection. The resulting series of collections is E $\flat$ -E $\flat$ -E-D-C-B $\flat$ -B-B $\flat$ -B, or if duplications are removed, E $\flat$ -E-D-C-B $\flat$ -B, which is remarkable for its symmetrical layout of ascending minor seconds (beginning and end) and descending major seconds (middle).

Such discussions inspire continued excellence in various ways. Students gain an increased sense of how many four-voice issues can be invoked simultaneously. They learn about pre-compositional planning vs. on-the-fly intuitive decisions, strict vs. flexible application of self-imposed rules, and composer intent vs. post-compositional analytic perspective. Particularly illuminating are moments when extraordinary relations are uncovered that the composer did not realize, facilitating discussions of how various theoretical concepts relate to composer intuition. Finally, nothing fuels students' creative fires more than seeing their professor treat the solutions with the same analytic respect that s/he does the works of Bartok, Debussy, and others.

It is also useful to improvise on such models in order to suggest how students can transform these exercises into music. Example 5 provides realizations of the homophonic model found in Ex. 4. In (a) and (b), consistency in chordal texture and register make the relationship of model and realization straightforward. In (c) chordal arpeggios effect a sweeping registral ascent and in (d) there is a salient change from melody-and-accompaniment to note-against-note texture, as well as some octave transfer, note omission, and triadic misalignment.¹¹

Overall, students create, play and describe their own poly-triadic experiment, sing and ponder several others, and hear improvisations in a variety of musical textures. This experience equips students to understand relevant excerpts from the twentieth-century repertoire in the same way that four-voice writing, keyboard harmony and aural skills exercises dealing with common-practice harmony facilitate the analysis of tonal music. It is therefore natural to

¹¹ Ironically, despite the obvious compositional implications of the sound experiments, I have found it helpful to emphasize, especially at first, that the experiments produce harmonic models, *not actual music*. On a basic, somewhat humorous level this wins over students who are skeptical of dissonant harmonic materials, but more seriously it also helps to alleviate the musical paralysis that grips some students when they are asked to "compose music." Moreover, this attitude towards the exercises discourages shallow and subjective evaluation of the results. It is irrelevant whether or not a student "likes" the sounds or not (although they often do, at least eventually); instead we value accuracy, clarity, clever pre-compositional manipulations, intuitive idiosyncratic touches, the balancing of multiple compositional considerations—in short, effort.

(a) *Leggiero*

(b) *Eclatant*

(c) *Scherzando*

(d) *Andante espressivo*

Example 5: Sample musical realizations of Ex. 4.

pair this sound experiment with analysis of existing poly-triadic passages, a plentiful supply of which is provided by extant texts and anthologies. For example, Burkhart's *Anthology for Musical Analysis* includes the second movement of William Schuman's *Three Score Set* (1943), which has a straightforward chord-against-chord texture, Stravinsky's *Le Sacre du Printemps* (1911-12) (Introduction to Part II), where the chordal strata move at different rates, and Ives's "General William Booth Enters into Heaven;" Kostka's text provides a passage from Persichetti's *Little Piano Book*, as well as two short Stravinsky excerpts (from *Petrushka* and *The Rake's Progress*) that feature triadic arpeggiation; and Persichetti suggests further passages, including several by composers whose works are studied less often in such courses (Peter Racine Fricker, Roy Harris, Arthur Honegger, and Albert Roussel).¹²

(a) Complete the following chart by spelling all twelve minor seventh chords, arranged so that tritone-related ones are vertically aligned:

C E $\flat$ G B $\flat$	C $\sharp$ E G $\sharp$ B	D F A C	E $\flat$ G $\flat$ B $\flat$ D $\flat$	E G B D	F A $\flat$ C $\flat$ E $\flat$
F $\sharp$ A C $\sharp$ E	G B $\flat$ D F	G $\sharp$ B $\sharp$ D $\sharp$ F $\sharp$	A C E G	B $\flat$ D $\flat$ F A $\flat$	B $\sharp$ D $\sharp$ F $\sharp$ A $\sharp$

(b) Tritone-related minor seventh chords combine to form what collection type? octatonic

(c) Harmonize the following melody in four voices with tritone-related minor seventh chords. Consult the chart in (a) for possibilities. For example, start by looking in the chart for a vertically-aligned chord pair with C in one chord and D in the other. Consider voice-leading carefully. Provide analysis and explain your choices.

$P_{C(1-4)}$ $RP_{F(4-1)}$ $RI_{D(4-1)}$ $I_{A(1-4)}$ $P_{C(5-8)}$ $I_{B(5-8)}$

m7: F B F B E B $\flat$ B F

Example 6: Tritone-related minor seventh chords.

¹² See Charles Burkhart, *Anthology for Musical Analysis*, 6th ed. (New York: Schirmer, 2004): 440, 458–60 and 514; Kostka, *Materials and Techniques*: 66–69; and Persichetti, *Twentieth-Century Harmony*: 150. Indeed, these books are useful sources of material for many of the topics mentioned in this paper.

The exercise in Ex. 6 leads the student step-by-step to a harmonization saturated with tritone-related minor seventh chords. The student spells all twelve minor seventh chords organized into tritone-related pairs, notes the resulting octatonicism, and receives directions on how to use the chart to harmonize the melody.¹³ Sometimes the pre-compositional plan is sufficient to “make” a choice; for example, only Fm7–Bm7 can harmonize C–D and E♭–B. (The use of its retrograde, Bm7–Fm7 to harmonize A–A♭ creates clear harmonic closure.) At other times the plan does not completely restrict choice, as with G–B♭, which has two possible harmonizations, Em7–B♭m7 and Am7–E♭m7.

But once again the solution goes beyond the minimum requirements, this time in the motivic realm, as shown by the numerous melodic fragments labeled on the score. Given the strict harmonic framework, it might seem that tremendous pre-compositional planning would be required to create the simultaneously unfolding set of P/RP/RI/I-related fragments at the beginning of the passage, but in this case it is mostly luck. If one sets out humbly attempting to create a bass line that is inversionally symmetrical with the soprano, the alto and tenor’s motivic connections arise automatically by using the smoothest voice leading possible with the remaining chord tones.

The next exercise explores dominant seventh chords with octatonic extensions (♭9, #9, #11, 13).¹⁴ Like the previous example, this one requires students to create a preliminary chart (Ex. 7). But this time students are *not* told how to choose chords from the chart; they are simply urged to “give careful thought to the bass line,” a deliberately vague direction that leaves innumerable possibilities. Although students are asked for only two solutions, the example provides ten, demonstrating various ways to organize the bass line.

¹³ Here and below, examples do not include student’s prose explanations; instead salient points from these explanations are incorporated into the text of the article..

¹⁴ ♭9, #9, #11, and 13 are called octatonic extensions because a dominant seventh chord with all of these extensions forms an octatonic collection. For example, B7 (B–D♯–F♯–A) and its octatonic extensions (C, D, E♯, G♯) combine to form B–C–D–D♯–E♯–F♯–G♯–A. A thorough understanding of the collectional embeddings of various extended tertian chords is essential for analysis, not only of jazz, but also of the music of Debussy, Scriabin and many others.

(a) Complete TWO four-voice harmonizations of the given soprano, in which the lower three voices state dominant seventh chords (omit the fifth), and the soprano voice is one of the "octatonic" extensions ($\flat 9$, $\sharp 9$, $\sharp 11$, or 13). First, complete the chart below to see which chords can harmonize each soprano note. (For example, if the first soprano note C is a $\flat 9$ then the chord is B7, if C is $\sharp 9$ then the chord is A7, etc.).

Soprano:	C	D	E $\flat$	B	G	B $\flat$	A	A $\flat$
$\flat 9$:	B7	C $\sharp$ 7	D7	B $\flat$ 7	F $\sharp$ 7	A7	A $\flat$ 7	G7
$\sharp 9$:	A7	B7	C7	A $\flat$ 7	E7	G7	F $\sharp$ 7	F7
$\sharp 11$:	F $\sharp$ 7	A $\flat$ 7	A7	F7	D $\flat$ 7	E7	E $\flat$ 7	D7
13:	E $\flat$ 7	F7	F $\sharp$ 7	D7	B $\flat$ 7	D $\flat$ 7	C7	B7

(b) Now complete your harmonizations, giving careful thought to the bass line. Provide analysis and explain your choices.

1. Root motion by descending fifth

13 $\flat 9$ $\sharp 11$ $\sharp 9$ $\sharp 11$ $\sharp 9$ $\sharp 9$ $\sharp 9$ 13
Eb7 Ab7 C7 F7 Eb7 Ab7 F $\sharp$ 7 B7

2. Root motion by tritone

$\flat 9$ 13 $\flat 9$ $\sharp 9$ 13 $\sharp 11$ $\flat 9$ $\sharp 11$
B7 F7 D7 Ab7 B $\flat$ 7 E7 A $\flat$ 7 D7

3. Root motion by major second

13 $\flat 9$ $\sharp 9$ 13 $\flat 9$ $\sharp 11$ $\sharp 11$ $\sharp 9$
Eb7 D $\flat$ 7 C7 D7 F $\sharp$ 7 E7 E $\flat$ 7 F7

4. Descending bass, primarily stepwise

$\flat 9$ $\sharp 11$ 13 $\sharp 11$ $\sharp 11$ 13 13 13
B7 A $\flat$ 7 G $\flat$ 7 F7 D $\flat$ 7 C7 B $\flat$ 7 A $\flat$ 7

Example 7: Dominant sevenths with $\flat 9$, $\sharp 9$, $\sharp 11$, 13 extensions.

5. Each measure is octatonic

B7 F7 D7 B $\flat$ 7 E7 A7 E $\flat$ 7 C7 F7 B7

6. Root motion that alternates ascending minor thirds and descending major thirds

B7 D7 B $\flat$ 7 C $\sharp$ 7 A7 C7 A $\flat$ 7 B7

7. Bass moves exclusively in minor seconds

A7 A $\flat$ 7 A7 A $\flat$ 7 F $\sharp$ 7 E7 G7 F $\sharp$ 7 E $\flat$ 7 D7

↓M2

8. Pedal bass

F $\sharp$ 7 A $\flat$ 7 F $\sharp$ 7 A $\flat$ 7 F $\sharp$ 7 A $\flat$ 7 F $\sharp$ 7 A $\flat$ 7 = D7 A7 C $\sharp$ 7 C7 B $\flat$ 7 F $\sharp$ 7

9. Bass articulates $r_4RP_{B\flat}$

A7 C $\sharp$ 7 C7 B $\flat$ 7 F $\sharp$ 7

10. Bass articulates r_2RP_A

G7 A $\flat$ 7 F7 B7 A7 F7 F#7 G7 E7 A $\flat$ 7 C7 B7

Example 7 continued

Solutions 1–4 each focus on a single interval, but vary with respect to interval type. Solution 1 focuses on the “descending perfect fifth,” a directed specific interval, while 3 highlights the “major second,” an *undirected* specific interval. Solution 4 articulates “descending” contour intervals, with particular emphasis on the “descending step,” a directed generic interval. In solutions 1–3, each of four chord-pairs articulates the featured interval, while 4 contains a complete string of “descending” contour intervals. Such solutions are easy to construct using the chart developed in part (a).

But each of these solutions also has other interesting features. In solution 2 all but the fifth and sixth chords belong to a single octatonic collection. Solution 3’s bass line divides into transpositionally related halves, E^b-D^b-C-D and $F^\sharp-E-E^b-F$. In solution 4, although the musical surface does not articulate a particularly clear pattern, the underlying root progression $B-A^b-G^b-F-D^b-C-B$ alternates perfect fourths and minor seconds, travelling an octave overall. In this interpretation the A^b and D^b chords are viewed as “passing,” which is sensible given their weak metric positions.

Solutions 5 and 6 each focus on a *pair* of intervals. In solution 5 each measure is limited to a single octatonic collection and so there is root motion by tritone and minor third perforce. Moreover, the bass in the third measure is motivically parallel to that of the first measure, and the ending $F-B$ creates closure by reversing the opening $B-F$. In solution 6, root motion alternates ascending minor thirds and descending major thirds. The progression begins and ends on B and the harmonic rhythm accelerates then decelerates. While it may seem unlikely that a student would come up with such an answer, it is not far fetched. For example, if one sets out with the modest goal of holding a common root note wherever possible, four possibilities arise directly from the chart in Ex. 7(a): $B7$ harmonizes $C-D$, $D7$ harmonizes E^b-B , B^b7 harmonizes $B-G$, and $C^\sharp7$ harmonizes $G-B^b$. This leads to the harmonization of the first six melodic notes with $B7-D7-B^b7-C^\sharp7$. The recurrence of the ascending minor third at $B-D$ and $B^b-C^\sharp$ is mere coincidence, but if the pattern is noticed, it can be continued to yield the given harmonization. The appearance of $B7$ at both beginning and end, and the accelerating-then-decelerating harmonic rhythm are purely accidental. The solution is elegant because of the intervallic pattern but quirky because the accompanying chords never proceed at the same rate as the soprano melody.

The foregoing solutions use only root position chords, but solutions 7 and 8 include some chordal inversion in order to facilitate consistent bass lines. The bass in solution 7 moves exclusively by half-step and in a constant quarter-note rhythm. Additional traits include the repetition of A7–A $\flat$ 7, the sequential repetition of a four-beat pattern down by step, the exclusive use of *root* motion by minor second and minor third, and only two types of extensions, #9 and #11. In solution 8 a static bass line underpins F#7/A $\flat$ 7 oscillation. Further, except for the tenor voice G, the entire alto, tenor and bass lines belong to a single whole-tone collection. In order to accomplish this the sixth chord places $\flat$ 9 in the *tenor* voice and the final chord #11 in the *alto*, thereby breaking the rule of having the octatonic extensions in the soprano. But this seems a small price to pay for such an extraordinary harmonization—a static bass line and only two different harmonies! Besides, the tenor $\flat$ 9 arises smoothly through a voice exchange and the final chord is enharmonically equivalent to D7(#11), an interpretation that *does* place the #11 extension in the soprano.¹⁵

Instead of creating recurring bass patterns as the first eight solutions do, 9 and 10 place transformed versions of the given soprano in the bass, $r_4RP_{\flat}$ and r_2RP_A respectively. Solutions such as these can be extracted from the chart in part (a) through simple trial and error, although the amount of work required is admittedly more than most students would choose to undertake. Nonetheless, such advanced solutions can be presented to students as a way of inspiring effort in subsequent assignments. Solution 9 is particularly amazing because it uses only two types of extensions, $\flat$ 9 and #9, arranged into a precise palindrome!

¹⁵ Students are encouraged to break rules only when necessary to include some extraordinary relationship.

Provide TWO five-voice pentatonic harmonizations of the given melody. (You will find it helpful to draw a circle of perfect fifths to outline the possibilities because each pentatonic collection is composed of five consecutive notes on the circle.) The harmonizations should contrast with each other in some way. Provide analysis and explain your choices.

(a) Minimum common tones

Pentatonic: A^b (p5ths) G A^b A B^b G^b C G^b (add6,9)

(b) Many common tones within measures

Pentatonic: B^b (add6,9) E^b D G B^b F B (add6,9)

Example 8: Pentatonic settings.

Ex. 8 provides two pentatonic harmonizations that are sensitive to the number of pitch classes shared by adjacent pentatonic chords. In (a), adjacent chords share *no* common pitch classes, except for the sharing of B^b by the B^b and G^b collections. In (b), pentatonic chords within the same measure share *four* common pitch classes, but chords separated by a bar line share *zero* or *two*, which creates clear and strong harmonic change at the beginning of each measure. Solution (a) is also notable because the alto voice is a strict r_4RT6 transformation of the soprano voice. Extraordinarily enough, the alto and soprano voices are invariably either a perfect fourth or a perfect fifth apart. Although chord spacing is not strictly systematic, the first and last chords of each harmonization create harmonic stability by placing their referential pitch class in the bass voice. Solution (a) begins with a stacked-fifth chord on A^b , while the others suggest a tertian interpretation—root position major triad with added sixth and ninth.

SOUND EXPERIMENTS: THE USE OF FOUR-VOICE WRITING

You will be creating harmonizations saturated with [016]. It will be helpful to have a list of all of the possible [016] to use as a reference, so complete the following chart:

[016] [↑] : C C [♯] F [♯]	C [♯] D G	D E [♭] A [♭]	D [♯] E A	E F B [♭]	F F [♯] B
F [♯] G C	G G [♯] C [♯]	G [♯] A D	A B [♭] E	A [♯] B E	B C F
[016] [↓] : C B F [♯]	C [♯] C G	D C [♯] G [♯]	E [♭] D A	E E [♭] B [♭]	F E B
G [♭] F C	G F [♯] C [♭]	A [♭] G D	A G [♯] D [♯]	B [♭] A E	B B [♭] F

- (a) Add an alto and bass line to the given soprano so that each chord is a [016][↑] or [016][↓]. As shown on the chart, there are six possible chords for each soprano note. The bass line should move primarily by descending step. Provide analysis and explain other features of the setting.

complementary hexachords produce the aggregate

[016][↑]: C D E F G A B C
 [016][↓]: F E D C B A G F

palindrome T11 T9 T9 T11 T11

- (b) Provide a six-voice harmonization in which the upper three voices form [016], as do the lower three. The upper and lower [016] share no pitch classes. Provide analysis and explain chord choice, chord spacing, and bass line.

Upper[016][↑]: C D A B F[♯] E A A[♭]
 Lower[016][↓]: B C[♯] A[♭] B[♭] F E[♭] A[♭] G

T2 T7 T2 T7 T10 T5 T11

- (c) Add an alto and bass line to the given soprano so that each chord is a [016][↑] or [016][↓]. Provide analysis and explain other aspects of the setting.

[016][↑]: C D E F G A B C
 [016][↓]: F E D C B A G F

T2 T2 T2 T10 T10 T10 T10 T10

Example 9: [016].

Creating a smooth transition from extended tonal to atonal materials, we move directly to [016] harmonizations of Melody 1. Referential charts such as those found in Ex. 9 are crucial because students are initially less adept at spelling set types and because such charts facilitate the consideration of various possibilities; for example, it is helpful to have at hand all six [016]s that can harmonize a given soprano note.

Solution (a) is particularly elegant because the bass line is *completely* stepwise, beginning and ending with F–E♭–D, $I_{F(1-3)}$. The bass keeps quarter-note motion going throughout, and even includes a pair of eighths that leads smoothly to the return of F–E♭–D. As a bonus, the alto line also emphasizes descending stepwise motion and ends with $RP_{D^b(3-1)}$.

Compelling harmonic relations complement these melodic associations.¹⁶ The passage begins with the palindromic nesting of $[016]_{\downarrow E^b}$ and $[016]_{\uparrow B}$. Taken as a unit, these trichords articulate $[023568]_{\uparrow A'}$ which is followed by its literal pc complement, thereby completing the aggregate just in time for the return of F–E♭–D. (Only the sustained soprano B even slightly obscures the clear hexachordal division of the aggregate.) [023568] is also the only hexachordal set type that is a subset of both the octatonic and acoustic collections, which is of particular interest because the bass line in its entirety articulates an A♭ acoustic collection (A♭–B♭–C–D–E♭–F–G♭)¹⁷ and T9-related [016]s create octatonic subsets near the end of the passage. There is also some uniformity with regard to chord progression: the palindrome T11–T9–T9–T11, an additional T11, and two places where inversionally-related [016]s with the same starting point are contiguous ($\uparrow_G-\downarrow_G$ and $\uparrow_{E^b}-\downarrow_{E^b}$). Extraordinary here is the juxtaposition of disparate interpretation types: simple stepwise motion alongside the erudite notion of pitch-class complementation, and extended tonal interpretations alongside atonal ones.

Solution (b) demonstrates consistency in the use of [016] within each chord, in the progression from one chord to the next, within the bass line, and concerning outer-voice intervals. In each chord the women's voices articulate $[016]_{\uparrow}$ and the men's $[016]_{\downarrow}$. With

¹⁶ For the sake of clarity these solutions use a labeling shorthand in which the prime form—which is the same for each set—appears only at the beginning of the line.

¹⁷ Since each acoustic scale is a “mode” of some ascending melodic minor scale, and since this bass line articulates no clear tonal center, the bass pitch classes could also be characterized as an E♭ ascending melodic minor collection (E♭–F–G♭–A♭–B♭–C–D).

only one exception the $[016]\uparrow$ s span less than an octave and the $[016]\downarrow$ s span more than an octave. The starting point for each $[016]\uparrow$ is consistently one half step higher than that of the accompanying $[016]\downarrow$, as for instance with the opening chord's $[016]\uparrow_c$ and $[016]\downarrow_{B^b}$, so that each six-note chord articulates the same set type, $[012378]$. Given the non-sequential nature of the given soprano line, it is remarkable that the passage includes a recurring pattern of transpositions: alternation between T2 and T7, followed by their complements T10 and T5. The bass line divides neatly in half, with $F-G-A^b-A$ being answered by its inversion $F-E^b-D-D^b$. This bass line also creates a limited set of intervals with the given soprano voice, compound major ninths in m. 2 and compound perfect fifths elsewhere.

In solution (c) a series of $[016]\uparrow$ articulates T2–T2 and a later series of $[016]\downarrow$ articulates the complementary T10–T10.¹⁸ Although the concluding $[012]$ contravenes the directions for the assignment, it makes sense for many interesting reasons. First, the $[012]$'s bass G^b_4 extends the chromatic descent initiated in the soprano voice's $B^b_4-A_4-A^b_4$ and continued by the alto's G_4 . Second, not only does the concluding D^b-G^b create a quasi-cadential dominant-to-tonic bass motion, but it also reinforces salient bass pitch classes—the bass line's opening $F^\sharp$, the T7I-related melodic fragments that end on $F^\sharp$ and D^b respectively, and the D^b major triad arpeggio.

(a) T10/T2 model (b) With rhythm of passage (c) With pitch layout of passage

Example 10: Hearing the T2 and T10 series in Ex. 9(c).

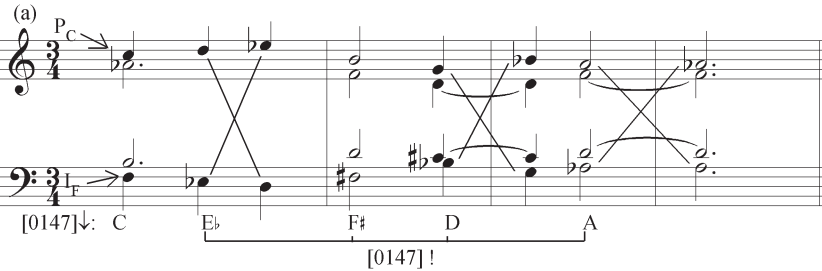
¹⁸ There are other instances of $[016]$ in the passage but they do not significantly disrupt the T2 and T10 series. One occurs at the beginning (before the T2 series) and the others appear in metrically weak positions, the quarter-note triplet in m. 2, and the eighth-note offbeat at the beginning of m. 3.

You will be creating harmonizations saturated with [0147]. It will be helpful to have a list of all of the possible [0147]s to use as a reference, so complete the following chart:

[0147]↑:	C	C♯	E	G	C♯	D	E♯	G♯	D	E♭	F♯	A	E♭	E	G	B♭	E	F	G♯	B	F	F♯	A	C
	F♯	G	A♯	C♯	G	G♯	B	D	A♭	A	C	E♭	A	B♭	C	E	B♭	B	D	F	B	C	D♯	F♯
[0147]↓:	C	B	A♭	F	C♯	C	A	F♯	D	C♯	B♭	G	D♯	D	B	G♯	E	D♯	C	A	F	E	D	B♭
	F♯	F	D	B	G	F	E♭	C	G♯	G	E	C♯	A	G♯	F	D	B♭	A	G♯	E♭	B	B♭	G	E

Complete in four voices. (1) The bass line should articulate an I, RP, or RI form; use a mixture of quarter and half notes so that interval class 2 does not appear between soprano and bass. If ic 2 is a continuing problem, pick a different row form. (2) Complete the inner voices so that each chord is [0147]. This is guaranteed to be possible because [0147] includes every interval class except 2. Complete THREE such harmonizations, limiting yourself to either ↑ OR ↓ forms of [0147] within each harmonization. Provide analysis and explain other aspects of your setting.

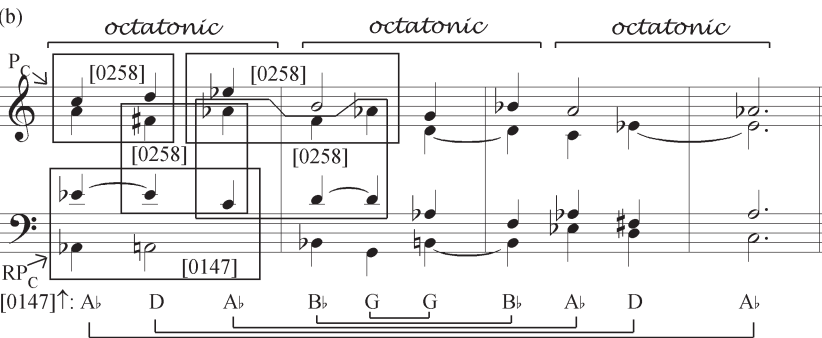
(a)



[0147]↓: C E♭ F♯ D A

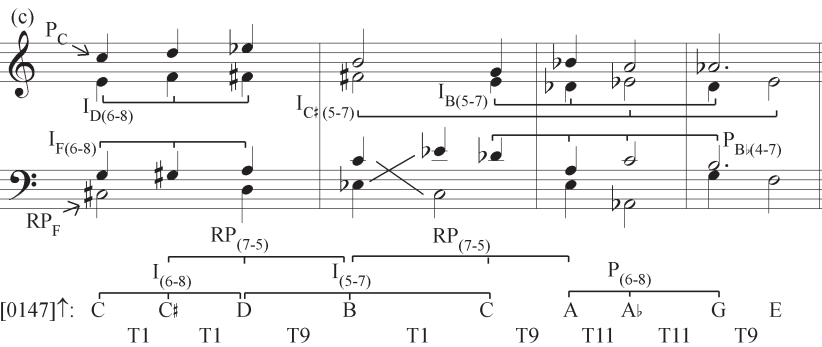
[0147]!

(b)



[0147]↑: A♭ D A♭ B♭ G G B♭ A♭ D A♭

(c)



[0147]↑: C C♯ D B C A A♭ G E

T1 T1 T9 T1 T9 T11 T11 T9

Example 11: [0147].

Further, the final G^b helps to create $[016]\downarrow_{G'}$, which extends the T10 series. In fact the last measure extends both the T2 *and* T10 series, so that each travels T6 overall. There is a sense of completion to each series and a clear relationship between them because each begins and ends with a $[016]$ that includes the $\{C\sharp G\}$ dyad. Ex. 10(a) represents the T2 and T10 series in note-against-note fashion with consistent inversionally-symmetric pitch-space layouts. Parts (b) and (c) alter the rhythm and spatial layout of this model to conform to the actual passage. A performance of this example followed by the passage can help some students to understand, hear, and even embrace the interpretation because it connects the model in 10(a), where T2 and T10 are very easy to hear, to the actual passage, where the transformations are more subtly articulated.

The settings in Ex. 11 require that each note be harmonized with $[0147]$ and that a transformation of the melody be present in the bass. Of further note in solution (a) are three soprano-bass voice exchanges, a set of $[0147]\downarrow$ whose starting points project $[0147]$ and smooth alto and tenor voices. Solution (b) articulates a palindromic set structure that goes hand in hand with the RT0-related pairs of voices (sop/bass, alto/tenor). Further melodic and harmonic coherence is provided by repeated use of $[0147]\uparrow_{A'}$, octatonicism, inner-voice minor thirds, and quartets of pitches that state $[0147]$ or $[0258]$, which, due to the palindrome, also appear in the second half of the passage.

Solution (c) is notable for its motivic saturation. Outer voices state P_C and RP_F and inner ones project motivic fragments. The tenor line's $P_{B^b(4-7)}$ forms a fleeting canon with the soprano line, and the final six alto pitches interlock $I_{C\sharp(5-7)}$ and $I_{B(5-7)'}^b$ one articulated by half notes and the other by quarters. It is also possible to hear $I_{C\sharp(5-7)}$ and $I_{B(5-7)}$ as a unit, a series of $[02]$ dyads, $\{E\sharp\}-\{D^bE^b\}-\{DE\}$, that articulates T9–T1. T9 and T1 also figure prominently in the transformation of one $[0147]\uparrow$ into the next. The chain T1–T9–T1–T9 signals overlapping $RP_{(5-7)}$ and $I_{(5-7)}$ references, and T1–T1 and its complementary T11–T11 allude to order positions 6–8. All told, the main motive pervades each voice independently as well as the four-voice texture as a whole.

Overall, these [016] and [0147] exercises can be linked pedagogically to a study of repertoire excerpts that contain consecutive instances of a single set type. A prime example is the thirteen-chord series of [0146]s in Carter's *First String Quartet*, which the composer himself highlights in his lecture "Shop Talk by an American Composer."¹⁹ Since most atonal passages include more than one set type some sound experiments should too. For example, one could instruct students to create progressions involving *two* trichord types of their choosing (excluding [036], [037] and [048]) and then create an *ad hoc* dictation activity based on exemplary solutions. Play each progression twice, asking the class first to identify the two set types used and then to aurally distinguish between these set types, chord by chord. Another possibility is to study the supersets of [016] by creating four-voice harmonizations in which the lower three notes of each chord cooperate to articulate [016] without duplicating the chord's soprano pitch class. Within these constraints, nine tetrachordal set types are possible. For a more limited tetrachordal repertoire study only set types that also contain [012] ([0126] and [0127]), that contain at least two [016]s ([0127], [0156], and [0167]), or that are also octatonic subsets ([0136], [0137], [0146], [0147], [0167]). In general, the loosening of harmonic restrictions should be coupled with a tightening of melodic ones such as by requiring that melodic motion be limited to one or two intervals.

As malleable as Melody 1 has proven to be, it is unhelpful when a clear tonal/modal center is needed. Ex. 12 and 13 include harmonizations of Melody 2, a G Dorian tune. Ex. 12(a) is triadic, with authentic and plagal embellishments of tonic and a standard IV–v–i cadence. In 12(b) a series of lower-voice perfect fifths articulates loose inversional symmetry with the soprano melody and then an inexact motivic parallelism. When reckoned in conjunction with the melody, these fifths create three types of sonorities: open fifths (on the tonic and dominant scale degrees), incomplete seventh chords, and three-note quintal chords.

While most solutions treat harmony quite systematically, solution (c) is primarily focused on *melodic* concerns. X_D and Y_C from the given

¹⁹ See Elliott Carter, "Shop Talk by an American Composer," in Jonathan W. Bernard, ed., *Elliott Carter: Collected Essays and Lectures, 1937-1995* (Rochester, NY: University of Rochester Press, 1997): 214-224. The excerpt, m. 477 from the third movement, appears on page 220. For other passages that feature a single set type consult Carter's "Dolphins" from *In Sleep, In Thunder*. mm. 32 and 56 feature series of [0147] and mm. 53-55 a series of [01235689], the complement of [0147]. See also the series of [014] at the opening of the third of Webern's *Five Movements for String Quartet*, op. 5.

(a) Primary triads

g dorian: i v i i IV i IV v i

(b) Lower voices in parallel perfect fifths

same

$W_{G/D}$ (loose symmetry with sop) $W_{B\sharp/F}$ (altered to conclude on tonic)

Open fifths: i i v v i
 Inc 7th chords: VII7 7 ii7 IV7 III7 VII7
 Quintal: * * * *

(c) Saturation of all voices with soprano's melodic material

Harmonic Outline: i IV7 v 4-3 i6 VII7 v6 III7 IV i

Example 12: Dorian settings of Melody 2.

soprano appear in other voices, transposed and/or rhythmically transformed. The alto voice is saturated with X_D - X_G - X_E - X_D , while tenor and bass each articulate Y_C . $Z_{B\sharp}$ and $RZ_{G\flat}$ pitch and rhythmic retrogrades of one another, create coherence within the tenor line. Harmonically, an underlying foundation of primary triads (i, IV, and v) is ornamented both by secondary seventh chords (VII7 and III7) and by other diatonic dissonance, which is only sometimes resolved in a conventional manner.

(a) G and F dorian

F dorian: 9 i7 VII7 #11 b13 ii7 i7 13 11 #11 VII7 9 9 i7

(b) G dorian and B mixolydian

B mixolydian: I VII I VII I vi v ii I ii VII I

Root motion by Maj 2nd:

Combined sonority:

AugMaj 7th: * * *

MinMaj 7th: *

Major 7th: * *

M/m triad: *

Triad w/b9: *

Example 13: Bi-modal settings of Melody 2.

Ex. 13 provides bi-modal harmonizations of Melody 2. In solution (a) the lower voices move in parallel seventh chords drawn from F Dorian. Since the G and F Dorian scales share five common tones it is not surprising that the soprano notes often fit into the accompanimental harmonies or form only mild dissonances (e.g. G–B $\flat$ within E $\flat$ M7 and G that forms a ninth above Fm7). In solution (b), the B Mixolydian accompaniment contains several whole-step root progressions: I–VII–I, vi–v, and ii–I–ii. Since the G Dorian and B Mixolydian modes share only two common tones—the minimum for a pair of diatonic collections—the result is predictably dissonant. Moreover, each soprano note is in a half-step relationship with one of the notes in the triad that accompanies it, creating dissonant sonorities such as augmented-major seventh chords (e.g. G–B–D $\sharp$ –F $\sharp$), superimposed major and minor triads (e.g. B–D–D $\sharp$ –F $\sharp$), and triads with added $\flat 9$ (e.g. A–C $\sharp$ –E–B $\flat$).²⁰

²⁰ For a particularly impressive source of modal and poly-modal excerpts, see Persichetti, *Twentieth-Century Harmony*: 41–3, which suggests more than fifty passages from the works of more than thirty different composers.

MORE FREEDOM

By completing such tightly-controlled musical experiments students learn to manipulate harmonic materials, to balance harmonic and melodic/motivic issues simultaneously, to create pre-compositional plans, to make *ad hoc* decisions on the fly, and to explore the implications of their own musical ideas. Equipped with these vital skills, students are ready for assignments that allow them freer reign. Ex. 14 provides one such composition assignment, which I use near the end of the study of extended tonal music after

Provide a four-voice vocal setting of ONE of the following excerpts from *The Little Zen Companion*:

- a. We are more curious about the meaning of dreams than about things we see when awake.—Diogenes
- b. This magnificent butterfly finds a little heap of dirt and sits still on it; but man will never on his heap of mud keep still...—Joseph Conrad
- c. Thus shall ye think of all this fleeting world:
A star at dawn, a bubble in a stream;
A flash of lightning in a summer cloud,
A flickering lamp, a phantom, and a dream.
—The Buddha

Include dynamics, phrasing, rests, tempo indication, etc. You may repeat text, especially if the text is very short. Provide some accompanying prose that explains salient harmonic, melodic, and motivic features of your piece.

You may use Hindemith's "A Swan" as a model—harmony that focuses on quintal chords and other pentatonic subsets, open fifths or major triads at phrase beginnings and endings, adjacent chords that usually belong to the same diatonic collection, primarily homophonic texture (perhaps with an imitative section), and a clever musical mirroring of the text's main idea. But use this song as a model only to the extent that it helps you. You are free to incorporate other harmonic materials and features that we have studied, *as long as the result is a unified and coherent composition*.

Example 14: Composition Assignment.

Example 15: Student response to Assignment 14.

Example 15: Student response to Assignment 14.

ten experiments including the ones in Examples 4, 6, 7, 8 and 12 above. Students are encouraged to use Hindemith's "A Swan" as a model *only* to the extent that it helps them create a good piece of their own—this is a composition assignment, not a style-emulation exercise. Examples 15–17 provide excerpts from student responses. Example 15, a quintal harmonization of an octatonic soprano, is notable for its lack of adjacently repeated pitches. The middle of the excerpt alternates transposition by descending major third and tritone and the end features two trios of chords whose referential pitch classes form quintal sonorities, $F-B^b-E^b$ and $E-A-B$, thereby replicating the construction of each chord. The excerpt concludes with the chord progression $E^b-E-A-B$, an ordered summary of the first half's $E^b-E-C\#-A-E^b-B$.

Although the passage unfolds primarily in a quarter-note harmonic rhythm, there are several longer harmonies: the opening half-note harmony created by side-by-side E^b chords, the mid-phrase dotted quarters that emphasize beat two (also E -flat chords), and the whole-note "dreams" chord, whose arrival *on* the measure downbeat resolves the metric/rhythmic conflict created by the mid-phrase emphasis on beat two. There is also a sense of drive towards the final chord because the attack points of the longer harmonies articulate the series of durations 5–4–3 (measured in

quarters), a large-scale acceleration. The “dreams” chord is also remarkable because its upper note (F#5) marks a registral highpoint and completes the soprano voice’s octatonic collection, and because the chord is the work’s only deviation from *strict* quintal harmony, the “top” fifth being diminished instead of perfect (B–F#–C#–G). Perhaps most compelling, the sonority articulates [0157], the set type also projected by two quartets of chords at the end of the passage (B–F–B♭–E♭ and E♭–E–A–B).

mp

This mag - ni - fi - cent but - ter - fly finds a lit - tle heap of dirt.

mp

G: I(add 9) quintneigh I aug ii7(9) P6/4 ii6/5 V4-

Penta: * * * * *

soprano line repeats pitch classes of m.2 with contour of m. 3

(1)

This mag - ni - fi - cent but - ter - fly sits still on it.

I(add9) quintneigh I(add9) ii6 V 6-(5) I 9-8

* * * * *

Example 16: Student response to Ex. 14.

Ex. 16 owes a considerable debt to conventional tonal practice. The excerpt features a pair of four-measure phrases and a prevailing G major tonality rife with familiar progressions such as I–ii–V–I. Diatonic dissonances ornament this underlying structure, often creating chords that are pentatonic subsets. These dissonances are usually treated freely, as with the soprano B in m. 3, a chordal ninth

quintal

octatonic

p *mf*

mf

Thus shall ye think of all this

Thus shall ye think of all this

Thus shall ye think of all this

Thus shall ye think of all this

Quintal: E F# G E C Eb V7 of... F#m Am o7 F#m D#o7

diatonic

C acoustic (plus Db)

pp *p* *mp* *mf*

flee - ting world: A star, a star at dawn

flee - ting world: A star, star at dawn

flee - ting world: A star at dawn

flee - ting world: star at dawn

Am Em fifths on G Daug Eo7 CM(add6)

Example 17: Student response to Ex. 14.

that is approached and left by leap. In a particularly ingenious touch, the quintal collection G–D–A occurs at the end of each phrase, first as an unresolved 4–3 suspension figure over dominant harmony and later creating a 9–8 appoggiatura figure over open-fifth tonic harmony. The passage’s chromatic tones are treated carefully, invariably resolving by half step to an adjacent diatonic note; consider for example each note of the quintal neighbor chord in m. 1. The augmented triad in m. 2, which is further ornamented by an appoggiatura F $\sharp$, contrasts with the prevailing quintal/pentatonic sonorities, but seems to arise sensibly nonetheless, at least partially because the alto voice’s chromatic D $\sharp$ has already appeared enharmonically as E $\flat$. Perhaps the nicest motivic moment occurs in m. 6, where the soprano line simultaneously refers to mm. 2 and 3.

Ex. 17 divides clearly into four sections: quintal, octatonic, diatonic, and acoustic. With such harmonic multiplicity, clever touches are needed to provide continuity. First, the quintal sonority in m. 3 morphs smoothly into C $\sharp$ 7, which then resolves as a dominant to F $\sharp$ m at the beginning of the octatonic section. Second, the transition from octatonic to diatonic is eased by the side-by-side statements of the progression F $\sharp$ m–Am, first within the octatonic section and then straddling the octatonic-diatonic boundary. (The latter F $\sharp$ m–Am is ornamented by an intervening weak-beat D $\sharp$ ²7 harmony.) Further, the cadence at “world” recalls the chords on the downbeats of mm. 1 and 2, sharing most of the same pitches and all but one pitch class ({EBF $\sharp$ }-{GDAE} in mm. 1-2 vs. {EBG}-{GDAE} in mm. 7-8). At the end of the passage “at dawn” recalls “world” in a similar fashion ({EGB $\flat$ D}-{ACEG} vs. {EGB}-{GDAE}).

Moreover, a recurring motive connects these various sections. In the first two sections all voices but the tenor articulate parallel motivic statements. At first, the bass line’s P_E = E–F $\sharp$ –G–E, the alto’s P_{F $\sharp$} , and the soprano’s P_{B $\flat$} , which is ornamented by an opening C appoggiatura, create parallel quintal harmonies. (This straightforward parallel motion is complicated by the tenor voice, which only briefly moves in parallel motion with the other voices.) In the octatonic passage, RP_{C $\sharp$} , RP_{A $\flat$} , and RP_{F $\sharp$} unfold together, creating a triadic parallelism that is camouflaged by several factors. First, RP_{F $\sharp$} and RP_{A $\flat$} include “tonal” alterations to accommodate the prevailing octatonicism, so that for instance the upper voices unfold

in a mixture of major and augmented thirds. Second, each motivic statement is ornamented with an interpolated note, in the bass an arpeggio, and in the upper voices neighbor notes B $\sharp$ and B $\flat$, which together help to create a striking non-harmonic formation. Finally, the motives are occasionally offset rhythmically, as when the final note of RP $_{C\sharp}$ arrives before the final notes of RP $_A$ and RP $_{F\sharp}$. Once again, the tenor voice is left out of the motivic party; this time it shadows the soprano throughout the phrase, doubling it an octave lower on measure downbeats and diverging elsewhere. The bass's I $_C$, which reuses the pitches of the opening P $_E$, overlaps with the end of RP $_{F\sharp}$ and continues on into the diatonic section. In the acoustic section, the soprano and alto voices once again unfold in a mixture of major and augmented thirds, articulating P $_D$ and P $_{B\flat}$. Of more global interest, the soprano line's statement of P $_{B'}$, RP $_{C\sharp}$ and P $_D$ over the course of the entire passage provides a large-scale articulation of the first three notes of P $_{B'}$ B–C $\sharp$ –D!

STYLE EMULATION

In addition to branching out from the sound experiments in the direction of original choral composition, it is also possible to require strict conformance to the style of a particular composer or repertoire. I have tended to shy away from style emulation assignments in the third-year core curriculum music theory course that I teach because there is not enough time to do them well—only twenty-four classroom hours to “cover” the many and diverse musical styles of the twentieth-century repertoire. Nonetheless, if a teacher is so inclined, many exciting types of four-voice exercises are possible.

For example, the class could undertake a detailed study of multiple movements from Hindemith's *Six Chansons* (including “A Swan” mentioned in Ex. 14) to prepare for four-voice composition in that style.²¹ Ex. 18 provides three Hindemith-like settings of a poetic fragment from Rilke's *Vergers (Orchards)*, which is also the poetic source for the *Six Chansons*.²² Most chords are pentatonic

²¹ Thanks are due to the anonymous reader whose suggestions led to this avenue of investigation. I also appreciate the many other helpful comments made on earlier drafts of this paper, not only by the anonymous readers and editor, but also by my colleagues Ryan McClelland and William Marvin.

²² The text and translation are taken from *The Complete French Poems of Rainer Maria Rilke* (Saint Paul: Graywolf Press, 2002): 170-1, with English translations by A. Poulin, Jr.

(a)

Sou - vent au - de - vant de nous l'â - me - oi - seau s'é - lan - ce;

Translation: The soul-bird often soars ahead of us;

(b)

Sou - vent au - de - vant de nous l'â - me - oi - seau s'é - lan - ce;

(c)

Sou - vent au - de - vant de nous l'â - me - oi - seau s'é - lan - ce;

Example 18: Emulating the style of Hindemith's *Six Chansons*.

subsets (quartal harmonies, minor seventh chords, major triads with added ninth, and so forth) and adjacent chords often belong to the same pentatonic (or at least diatonic) collection. Phrase beginnings and endings feature open fifths and triads, so that phrases are often “less dissonant” at the beginning and end and “more dissonant” in the middle. The text setting is usually syllabic, the melodic motion primarily stepwise, and the rhythm straightforward.

In addition to these general features, the excerpts contain more specific references to *chanson* passages. In setting (a), the opening choral unison recalls “The Doe” and “In Winter” (not shown). The “soaring” melisma suggests the quasi-melismatic setting of “sur notre âme” in “The Swan” and contrary motion between the upper- and lower-voice perfect fifths loosely imitates the climax at m. 11 of “The Doe.” In setting (b) the initial bass pedal B $\flat$ mimics the sustained soprano B at the outset of “A Swan” and the sustained bass A $\flat$ in the first phrase of “Springtime.” The outer voices at “s’élance” move in contrary motion by half-step (B $\flat$ –B and A $\flat$ –G), thereby recalling “la tremblante image” in “A Swan” where soprano F $\sharp$ –G and bass B–B $\flat$ bound the Bm7–E $\flat$ M $_4^6$ progression. Setting (c) features a phrase-long stepwise divergence of the outer voices reminiscent of phrase 2 of “Springtime,” a liberal sprinkling of major seventh chords into the otherwise pentatonic chordal vocabulary as in phrase 1 of “A Swan,” and, like setting (b), a chromatic approach to the cadence at “s’élance.”

In addition to exploring choral works by other composers, one could also branch out into the instrumental repertoire by using homophonic passages as a starting point. For instance, after studying Messiaen’s *L’Ascension* (1933), students could emulate the outer movements, which are primarily homophonic, or the inner movements, where homophony and other textures are mixed. As but one of many other possible examples, one could introduce the harmonic style of Schoenberg’s *Pierrot Lunaire* through homophonic passages in its accompaniment²³ and then require students to complete similar ones. In advanced pedagogical situations this harmonic work could be coupled with assignments concerning melody and motive, all leading to *Pierrot*-like compositions. Overall, whatever exercises are undertaken, it seems vital to encourage

²³ See for instance the piano’s chord progressions in “Valse de Chopin” (mm. 14–19), “Rote Messe” (mm. 23–4), “Die Kreuze” (m. 14), “Heimweh” (mm. 1–6) and “Serenade” (mm. 16–29), the wind/string homophony in “Eine blasse wäscherin,” and the violin/cello double-stop chords that begin “Raub.”

students to emulate, not only the surface harmonic and melodic features that define style, but also the profundity of the musical relationships that generate internal coherence and that make the music worthy of study.

CONCLUSION

The approach set forth in this article may be adapted to suit various pedagogical situations. Teachers can create easier or more difficult sound experiments as needed, and may explore many types of assignments other than melody harmonizations. These exercises can imitate the methods of a particular composer, invoke general compositional practice, or bring into play tonal organization that has yet to be exploited. The approach can deal with the harmonic materials of a wide range of repertoires and has implications for theoretical constructs other than those mentioned above. For instance, instead of harmonic controls based on set type, experiments could investigate aspects of Hindemith's chord classification system, Persichetti's "chords by seconds," or Morris's "twelve-tone figured bass."²⁴ Twelve-tone applications abound. Not only are there many possible homophonic realizations of a single row, but multiple row forms can unfold simultaneously and/or consecutively, creating progressions that illuminate various combinatorial and invariance properties. Moreover, three- and four-voice musical models are ideal vehicles for illuminating the properties of trichordal and tetrachordal partitions of the aggregate.²⁵ Finally, although most exercises in this article treat harmony quite systematically and incorporate additional features on an *ad hoc* basis, other exercises could reverse this bias and consider linear and motivic concerns to be primary.

Through such exercises students gain an intimate and detailed knowledge of twentieth-century harmonic materials and learn to relate these theoretical concepts to aural experience. These exercises constitute an integral part of a balanced set of assignment types (part writing, composition, analysis, keyboard, sight singing, dictation, etc.), which promotes a comprehensive understanding of

²⁴ See Hindemith, *Craft of Musical Composition*: 94-106; Persichetti, *Twentieth-Century Harmony*: 121-134; and Morris, *Recommendations*: 102-5.

²⁵ Properties of these and other aggregate partitions are addressed in Robert D. Morris and Brian Alegant, "The Even Partitions in Twelve-Tone Music," *Music Theory Spectrum* 10 (1988): 74-103.

post-tonal musical practice. Such knowledge is vital for musicians, not only because they may be called upon to lecture intelligently about the music, but also because increased sensitivity to pitch structure leads to more nuanced musical performance. Moreover, as students become familiar and comfortable with these musical materials, they are more likely to listen to, perform, and teach the repertoire. Put more urgently, perhaps it is only when we inside the theory classrooms treat twentieth-century music as seriously as we do common-practice tonal music that our students will respect and understand the repertoire enough to promote it enthusiastically outside the classroom. And it is high time that university-trained musicians be encouraged to acquire considerable technical expertise in this area. Many of the tonal practices under discussion were developed a full hundred years ago—the twentieth century is now over.





Understanding Sonata Form through Model Composition

Sylvia Parker

INTRODUCTION

Composition is an important aid to musical understanding. The NASM handbook states that “musicians benefit significantly from study and experience in the creation of musical works. . . . It also develops the musical mind, hones analytical capacities, and develops sensitivity to the possibilities of musical structure.”¹ This paper describes a plan for guiding intermediate music theory students to hone their understanding of classical sonata structure through composition.

Sonata-allegro is arguably the quintessential form in tonal music, certainly the most elaborate and prescriptive in terms of its component parts. It is deservedly the premiere form addressed in a music theory curriculum. Its study normally emphasizes description of tonal and thematic aspects, paired with analysis of selected works by master composers.

The average undergraduate student comes to an understanding of the contrasting functions of the sonata’s thematic, transitional, and developmental sections only with difficulty. Students who compose such sections themselves acquire a better understanding of the form than they who limit their study to analysis. Given the typical time constraints, composing a sonata may seem too large a project for an undergraduate class in form and analysis where rondo, song forms and chromatic harmony vie for equal billing. Yet such a project was indeed completed, with great success, in an intermediate theory class at the University of Vermont. More than a success, the experiment culminated in three students presenting their projects at a recent conference of the Vermont Academy of Arts and Sciences. In this article I shall recount how the project began as a multi-part homework assignment with drafts and revisions spreading over several weeks, continued in a take-home segment of the midterm exam, and concluded in presentation of compositions by the most successful students in a scholarly venue.

¹ *National Association of Schools of Music, Handbook 2003-2004*, “Notes for Music Faculty and Administrators: Standards for Composition/Improvisation, History/Repertory and Technology in Undergraduate Professional Degrees in Music,” <http://nasm.Arts-accredit.Org/index.jsp?Page=brochures+and+advisory+papers> (accessed January, 2006).

BACKGROUND

An Internet search of “teaching music form through composition” yields thousands of websites including grade school projects, college course listings, bibliographies, journal articles, textbooks, and more. Among the many sources are several offerings with especially thoughtful approaches to the use of composition as a teaching tool that have influenced the project in the present paper.

Arnold Schoenberg observes in *Fundamentals of Musical Composition*, “Without organization music would be an amorphous mass.”² Before proceeding to discuss and provide examples of compositional elements from the smallest (The Phrase and The Motive) to the largest (The Sonata-Allegro), Schoenberg asserts:

No beginner is capable of envisaging a composition in its entirety; hence he must proceed gradually, from the simpler to the more complex. Simplified practice forms, which do not always correspond to art forms, help a student to acquire the sense of form and a knowledge of the essentials of construction. It will be useful to start by building musical blocks and connecting them intelligently.³

Nicholas Cook’s *Analysis through Composition* provides a delightful approach to understanding music writing.⁴ It may be used either as a textbook or an “ideas bank” (Cook’s words) for supplementary materials. He states:

The purpose of [this] book is to create an environment of varied musical activity that will inculcate and nurture basic analytical concepts in a practical context. It is organized round a series of assignments that involve (among other things) writing arrangements, realizing accompaniments, composing variations, and expanding small pieces into larger ones.⁵

2 Arnold Schoenberg, *Fundamentals of Musical Composition* (Great Britain: by the Estate of Gertrude Schoenberg, 1967), 1.

3 Ibid., 2.

4 Nicholas Cook, *Analysis Through Composition: Principles of the Classical Style* (New York: Oxford University Press, 1996).

5 Ibid., vii.

His assignments are often based on actual works by famous composers, bringing composition to life in a most engaging way. Some examples are:

Assignment 25: Here Mozart has written only the first half of a minuet, but he has provided three alternative bass lines of increasing complexity. . . . Add inner parts to each version, basing what you write on Mozart's figures, and complete the minuet.⁶

Assignment 35: . . . Example 77 shows all that exists of [a] piece . . . written in Leopold Mozart's hand. . . . It was presumably intended to have a second half. . . . Construct a second half by using the same materials in the same order as in the first half, transposed as necessary. You need only write two new bars of music: a second-time bar for the first half . . . and the final bar of the second half.⁷

Assignment 47: Example 105 is the first half of a sonata movement by Antonio Soler, a Spanish composer who died in 1783. The original is in a fully-fledged sonata form as described in this chapter. Try to reconstruct it. . . . [T]here is no need to write out all the music that is simply transposed from the first half, but you should say whether it is to be transposed up or down.⁸

Miguel A. Roig-Francolí's textbook, *Harmony in Context*, presents a well-ordered sequence of the essential topics in a comprehensive undergraduate music theory course.⁹ Roig-Francolí provides excellent homework assignments such as:

Chapter 20 (Small Forms: Binary and Ternary): Compose two modulating periods (melody and accompaniment in keyboard style) based on the given motives. The modulating periods by Haydn in the worksheet and workbook for chapter 19 may serve as models. You may compose the melody first and then write the accompaniment, or write both at the same time.¹⁰

6 Ibid., 72.

7 Ibid., 111.

8 Ibid., 174.

9 Miguel A. Roig-Francolí, *Harmony in Context* (Boston: McGraw Hill, 2003).

10 Ibid., 613.

Chapter 22 (Modal Mixture; Variation Forms): Write a brief binary piece for a single instrument . . . using the theme provided below. 1. Begin by composing a modulating period, which will be your first reprise. The modulation should be to the relative major (III). 2. After you are satisfied with your initial period, continue writing the second reprise of the binary piece. First write a short developmental phrase on the given theme, perhaps used sequentially. This section will lead to V, which in turn will lead to a return of the tonic. 3. Then write again the initial phrase (the return), only now it should not modulate, but it should instead remain in the tonic key.¹¹

Earl Henry and Michael Rogers' text, *Tonality and Design in Music Theory*, theorizes "from the listener's perspective," drawing from "the well-established tradition of Comprehensive Musicianship in choosing and organizing topics." Its methodology is "intentionally eclectic."¹² Chapter-end exercises include timed self-tests on facts and techniques, analysis projects and essays, and compositions. The chapter on Sonata Form assigns a sonata exposition, with notated examples by the authors for each step in the assignment:

Compose the exposition of a sonata for piano that is designed for younger performers. Begin by choosing tonic and polar keys, then compose a simple theme in both keys or plan a monothematic work in which one theme serves both tonic and polar roles. An appropriate theme will be a double period in length and might be repeated with an alternate accompaniment pattern. This sample theme is a sectional double period that comprises of parallel and contrasting phrase groups. [Example in B_b]

Our sample second theme is in F major and is another sectional double period. [Example]

Before composing the linking transition, consider accompaniment figures that will be appropriate for the first and second themes. Alberti bass is usually a good

¹¹ Ibid., 662-663.

¹² Earl Henry and Michael Rogers, *Tonality and Design in Music Theory*, vol. 2 (Upper Saddle River, New Jersey: Pearson-Prentice Hall, 2005), xi.

choice; reiterated chord tones and a quasi-contrapuntal texture (as in the next three examples) are additional possibilities. [Examples]

There are many approaches to composing the transition. Because harmonic momentum is so important, you might begin with a chord progression such as the one that follows. [Example]

Compose a simple melodic line for the transition that includes sequence and employs scalar figures. As we have discussed, many different accompanying patterns are appropriate. [Example]

Now, put the three pieces together for a sonata exposition through the statement of the second theme. Observe that only the last four measures of the first theme and first four measures of the second theme are shown. [Example]¹³

SONATA

The model composition project described in this paper, akin to one of Schoenberg's simplified practice forms, resembles the carefully detailed assignments of Cook, Roig-Francolí, and Henry and Rogers. It is conceived as a large project made up of small parts, each within the grasp of intermediate undergraduate theory students who have not yet put their minds to composition. Its precise but simple instructions are designed to focus students' attention on the structural and functional elements of sonata-allegro. The project requires students to review concepts, work out new ideas particular to sonata form, and link the parts together into a cohesive whole. A supplementary goal is to provide a "road map" so that students can engage in composition with a measure of creativity and a high degree of confidence. The author's model form provides an experience that, if nothing else, will help students appreciate the far more sophisticated accomplishments of master composers. Included in this paper are examples of student compositions, student comments, and descriptions of problems and suggestions along the way.

¹³ Ibid., 227-229.

THE PROJECT

The project, compose a single movement for piano in classical sonata-allegro form, comprised intermediary assignments:

1. a) Choose principal and secondary themes from your sight singing text.
b) Optional: Compose a closing theme of your own.
2. Transpose the themes to appropriate keys for both exposition and recapitulation.
3. Provide accompaniments in classical piano style.
4. Compose transitions for exposition and recapitulation.
These should sound the same although they serve different modulatory functions. They may be dependent or independent.
5. Compose a development:
 - a) Label the thematic material in the exposition that you are developing.
 - b) Begin in the key in which the exposition ended.
 - c) Modulate to at least three different keys.
 - d) End the development on a prolonged dominant harmony (i.e., the dominant preparation for the recapitulation).

THEMES

In order to make the project possible within limited time, students were instructed to select themes from their sight-singing text.¹⁴ They chose, but did not compose, two melodies in the same meter, with tempos adjusted to accommodate a unified piece. Everyone understood that this “short-cut” omitted valuable steps in composition, but enabled completion of the sonata movement in the allotted time-frame.¹⁵ For the optional closing theme, some of the more creative students composed their own cadential passages. Those less comfortable with their compositional skills proceeded to the next step of the project.

¹⁴ Robert W. Ottman, *Music for Sight Singing*, 5th ed. (Upper Saddle River, New Jersey: Prentice Hall, 2001).

¹⁵ The author addresses concerns about this efficiency in the “Variations” section later in the article.

Students then were asked to transpose their secondary themes to the dominant or relative major for their expositions, and tonic for their recapitulations. If the sonata was to be in a minor key, the recapitulation's secondary theme also required a change of mode. The exercise of selecting and transposing melodies helped students internalize the form-defining harmonic outline.

Complications arose when a few students, predisposed to think of sonata as a long piece, initially chose the longest melodies they could find. They quickly realized, however, that longer melodies often contain internal modulations that would frustrate the harmonic objectives of their sonata-allegro. This in itself was a valuable lesson.

Next came the task of supplying accompaniments. This provided an excellent review of concepts from prior courses in theory and piano. Repeated-chord or broken-chord patterns were usually appropriate and most students composed Alberti basses or similar left-hand piano parts for their right-hand melodies.¹⁶ The writing of accompaniments reinforced the fundamental concepts of chord progressions supporting melodic pitches, preservation of the tonic-predominant-dominant-tonic phrase model, and awareness of the voice-leading implications of arpeggiations. Up-to-tempo performance (by the teacher or on computer if necessary) helped students hear the importance of placing strong notes, such as root or lowest pitch, on strong beats. Students also came to understand the advantage of maintaining a repeating pattern in their accompaniments. They had earlier analyzed Mozart's repetition of patterns across phrases, and had also practiced accompanying folk melodies with repeated patterns in their piano classes. But now with pencil in hand, some students felt that they were not really composing, not really doing enough, unless they changed patterns frequently. In periodic consultations with their instructor, students learned to focus on the clarity of the classical style that they were attempting to emulate.

Example A shows the principal, secondary and closing themes, with accompaniments, of one student sonata. Vickie explains to a scholarly audience of non-musicians:

¹⁶ One example of providing such accompaniment was cited in Henry and Rogers, *Tonality and Design in Music Theory*, above. Roig-Francolí suggests a plan for composing a left-hand keyboard accompaniment for a melody in *Harmony in Context*, 370. Most intermediate music students will also have learned to accompany folk melodies with broken-chord patterns in their piano classes.

The musical score for Example A is presented in three systems, each with a treble and bass staff joined by a brace. The key signature is E-flat major (three flats) and the time signature is common time (C). The first system, labeled 'Principal Theme', begins with a 'Piano' dynamic marking. The second system continues the Principal Theme. The third system, labeled 'Closing Theme', begins with a measure number of 19. The fourth system continues the Closing Theme, with measure numbers 21 and 23 indicated. The fifth system continues the Closing Theme, with measure numbers 25 and 27 indicated. The 'Secondary Theme' is shown in a separate system at the top right, marked with a 'Piano' dynamic. The 'Closing Theme' is marked with a 'Piano' dynamic.

Example A

Principal Theme: Ottman #137; Handel, *Judas Maccabeus*, bass clef, C meter, key of E $\flat$, Allegro.

Secondary Theme: Ottman #131; Mozart, *Serenade K. 237*, bass clef, C meter, key of C, Allegro.

Composing in sonata form is not as daunting as it sounds. Our first assignment was to find two simple melodies using one of our class text books, *Music for Sight Singing* by Robert W. Ottman. These short melodies, for which we provided piano accompaniment, would be used as the basis for our compositions. . . . In the exposition the first theme is in an original key (I) and the second theme is in the dominant key (V) or the relative major key (III), while in the recapitulation the first theme is still in the original key (I), but the second theme does not change keys and maintains the original key (I). . . . [The melodies] in my sonata are very simple, something easily hum-able. The selected themes are crucial to the entire sonata. They act as a kind of glue for the piece, both by opening and closing the piece, and by representing sections of them [i.e., by supplying motivic material that may reappear] throughout the transitions and the development.¹⁷

TRANSITIONS

After students had completed their themes, they focused on transitions in the exposition and recapitulation. To ensure understanding of the similarities yet differences between the two transitions, students were asked to compose them back-to-back (rather than writing their sonatas beginning to end). Transitions needed to be only a few measures long, but multiple concepts were involved: they needed to modulate, use either freestanding motives or thematic material from the principal theme (but not the secondary), announce the arrival of the secondary theme, and resemble each other in the exposition and recapitulation.

Students who found themselves at an impasse were advised to begin the transition with a partial restatement of the principal theme followed by sequential repetition of fragments (as in repertory already analyzed in class). Other students relished the opportunity to be creative, and they received only the gentlest curbing of their overly elaborate efforts. Their goal was to understand the process

¹⁷ Victoria Drew, University of Vermont, class of 2005: Remarks from Intercollegiate Student Symposium of the Vermont Academy of Arts and Sciences, April 24, 2004.

of transition, not necessarily to compose an expert sonata. Most saw that a small adjustment could facilitate modulation either to the dominant or relative major: for example, a strategically placed accidental might provide the new leading tone or transform a diatonic triad into an applied dominant.

The concept of announcing the secondary theme proved most difficult. While students had practiced composing modulations in their keyboard lab exercises, application of this skill set to their sonatas revealed that they did not yet fully understand the utility of modulation within the sonata structure. Reminding them of repertory analyzed earlier in class, the instructor hinted that they should end the transition on a half cadence, deferring arrival of the new key until the secondary theme.

Another challenge was to create a non-modulating transition for the recapitulation that would resemble its modulating counterpart in the sonata's exposition. To their great delight, students discovered that they could essentially recycle the earlier transition. Minus accidentals, similar materials led instead to a half cadence in the tonic key.

Example B shows Michael's transitions, first in mm. 10-21 between his principal theme in D $\flat$ and secondary theme in A $\flat$, then in mm. 81-94 where both themes are in D $\flat$.¹⁸ He explains:

A sonata has two primary themes within the exposition. The first theme is in the tonic key while the second theme is in the dominant, or a fifth higher than the tonic. To make this *transition* from the first theme to the second you must find a way to modulate to the dominant key. My transition begins at measure 10 and starts in the key of D $\flat$ major and needs to modulate to A $\flat$ major. I include hints of A $\flat$ major within my melody by including G naturals which would be the leading tone or 7th scale degree of A $\flat$. The majority of my transition is focusing on an E $\flat$ 7 chord which would be the dominant or V chord of A $\flat$ major, the key which we are trying to reach. I begin my dominant harmony at measure 15 which starts a feeling of a driving force rhythmically and harmonically toward something new our ears have not heard, and prolong the dominant until the half cadence in measure 21.

¹⁸ Michael Gorgone, University of Vermont, class of 2006: Remarks from Intercollegiate Student Symposium of the Vermont Academy of Arts and Sciences, April 24, 2004.

The musical score is presented in two systems. The first system contains the Principal Theme (measures 1-10) and a Transition (measures 11-16). The second system contains the Secondary Theme (measures 17-26) and a further Transition (measures 27-32). The Principal Theme is in treble clef, 6/8 meter, key of D♭, Lento. The Secondary Theme is in treble clef, 6/8 meter, key of E. The score includes various musical notations such as notes, rests, and dynamic markings like *rit.* and *accl.*.

Principal Theme

Transition

Secondary Theme

Example B

Principal Theme: Ottman #407; Beethoven, Quartet Op. 135, treble clef, 6/8 meter, key of D♭, Lento.

Secondary Theme: Ottman #397; Schubert, Canon for 3 Voices, treble clef, 6/8 meter, key of E.

It is common to have thematic material from the principal theme included within the transition of a sonata. At measure 13 I use the same exact idea I had for measure 6. I then changed it slightly at measure 14 to make it a major B $\flat$ chord instead of a minor B $\flat$ chord. It is also possible to have an independent transition where there is no thematic material taken from the principal theme and all the ideas are new.

The recapitulation includes a transition as well as the exposition but it varies slightly. This time our principal theme is still in the tonic key, but our secondary theme this time is also in the tonic key. The transition during the recapitulation ties the two themes together smoothly seeming as if it is going to modulate once again but truly stays within the tonic key. I use the same rhythmic idea during the dominant chord which in this case is A $\flat$, the dominant of the original tonic key starting at measure 89. I also use thematic material from the principal theme again from measures 85-86. This transition acts the same way as the original transition yet it stays in the tonic key.

DEVELOPMENT

The final task of the project was to compose the development. By composing their developments last, students saw their goal clearly—to connect the exposition and recapitulation. Having selected one or more motives from their expositions, they were cued to apply sequence, fragmentation, inversion, mutation of intervals or modality, variation in the accompaniment, or replacement of fragments with scales or arpeggios. Some students required continual reminders to use preexisting motives, their tendency being to create new material. Others tended to flit from one idea to another rather than follow through in longer spans. Their tentativeness in composing led many to proceed on the note-to-note level. Nudging them to think on a larger scale may have been one of the greatest benefits of the project.

To help students focus the harmonic plan of their development

sections, they were instructed to begin in the same key in which the exposition ended, modulate to at least three keys, and end with a dominant prolongation. Sensing the purpose and direction of the development proved difficult. Some students wandered aimlessly through the requisite modulations without planning a tonal trajectory that would carry them, logically, to the dominant. Others returned to the tonic prematurely rather than saving its arrival, the punch line, for the recapitulation. The instructor offered critiques guiding them to wait until the end of the development to create the important V chord and hear it take on its dominant function: a chosen triad needed to become major if it wasn't already, it needed a seventh to strengthen its tendency toward resolution, it needed prolongation or exaggeration, and it needed to arrive at, but not before, the end of the development. By constructing their own developments, students internalized the creation of instability and tension that resolve when the recapitulation arrives.

The musical score is presented in two systems. The first system contains the Principal Theme (measures 1-10) and the Secondary Theme (measures 11-20). The second system contains the Development (measures 21-30) and the Transition (measures 31-40). The Principal Theme is in 6/8 meter, key of F# minor, and the Secondary Theme is in 6/4 meter, key of A. The Development and Transition sections are in 6/8 meter, key of F# minor.

Principal Theme

Secondary Theme

Development

Transition

Example C

Principal Theme: Ottman #331; Germany (Brahms), treble clef, 6/8 meter, key of F# minor, Andante.

Secondary Theme: Ottman #329; Chile, treble clef, 6/4 meter, key of A, Quietly.

The musical score is presented in two systems. The first system contains the 'Dominant Preparation' section, which consists of two staves of music. The second system contains the 'Principal Theme' section, also consisting of two staves. The third system contains the 'Transition' section, consisting of two staves. The fourth system contains the 'Secondary Theme' section, consisting of two staves. The score is written in treble and bass clefs, with a key signature of one sharp (F#). The music features various rhythmic patterns, including eighth and sixteenth notes, and rests. The sections are labeled with their respective names: 'Dominant Preparation', 'Principal Theme', 'Transition', and 'Secondary Theme'. The score is enclosed in a rectangular box.

Example C Continued

Example C shows Rebecca's entire sonata. She explains her development, mm. 40-65:¹⁹

In the development, the two main themes are fragmented and woven into a texture of harmonic and tonal instability. It is considered unstable because one does not hear the affirmation and prolongation of a tonal center. Compositional techniques allow the presentation of brief sections in a variety of keys, none being firmly established. My sonata touches on many key areas. . . .²⁰ The development section is linked to the rest of the sonata through thematic fragmentation and development. A good composition would incorporate the elements of the two primary themes and the transition into the development section. In my sonata, thematic correspondence occurs between measures 1 and 45. The figure in measure 1 is part of the first main theme. The figure in measure 45 is a quoting of the same melodic material of measure 1, only they each start on different pitches.

A pivotal retransition is necessary in order to merge the harmonically unstable development section with the return of the tonic key in the recapitulation. This retransition utilizes the strong relationship between the dominant and tonic. . . . In Western classical music, the chord built on the fifth scale degree of any given key is always followed directly by the chord built on the first scale degree of that key.²¹ The development section ends on the "cliffhanger" dominant chord relative to the tonic key of the piece. It is a "cliffhanger" chord because the ear naturally wants this dominant chord to proceed to the tonic key, therefore ushering in the original thematic material. Since my sonata is in the key of F# minor, the dominant chord relative to it is a C# major chord. The

¹⁹ Rebecca Kopycinski, University of Vermont, class of 2005: Remarks from Intercollegiate Student Symposium of the Vermont Academy of Arts and Sciences, April 24, 2004.

²⁰ Rebecca's surprising choice of keys reflects, I believe, the fact that the theory course had proceeded, while the project was still in progress, to chromatic modulations and distant keys. She obviously enjoyed incorporating the novel techniques into her sonata. The author offers suggestions regarding keys in the "Variations" section that follows.

²¹ Rebecca's purpose here is to explain the concept of authentic cadence concisely to a non-musical audience. She omits possible cadences that were not relevant to her example.

retransition in my piece begins at measure 61 on the second beat and leads to the recapitulation at measures 65 and 66.

CONCLUSION

By combining the separately-composed sections students produced completed sonata movements, which were then graded as a take-home portion of the midterm exam. The short assignments along the way gave students experience in planning a harmonic and thematic structure, practical application of their piano accompanying skills, review of harmonization and modulation, practice in voice leading, and experience in developing pre-existing ideas. An unforeseen benefit was the boost that students experienced in their confidence and excitement that they—even those “afraid of theory”—really could compose. Several students subsequently enrolled in composition courses including some who, before this experience, had been far too timid to test the waters of creativity.

VARIATIONS

This project successfully achieved the goal of having students internalize sonata-allegro form through composing. Nevertheless, adjustments might engender an even more beneficial experience. Some variations are suggested here, and readers may envision others.

Using preexisting melodies, efficient though it may be, omits crucial steps required of accomplished composers. In actual composition, one would consider the smallest motivic gestures, repeating, expanding and combining them into a coherent whole. While the students attempted to choose melodies that could be motivically related, such relationships were superficial at best. With advance planning, students might compose phrases or periods of their own with attention to motivic detail and interrelationships between two contrasting examples that would then become sonata themes. Alternatively, the instructor could provide starting material.

In a previous semester, with less course time available, the author provided actual principal and secondary themes from an existing but unfamiliar classical sonata. Students then composed only the transitions and development. Their reward was seeing the original

complete sonata (by Mozart, in this instance) for comparison with their own. Experiencing the process of composing the missing links themselves made them acutely aware of the details of Mozart's "answers."

More guidelines for choice of keys in the development would strengthen the project. While the current assignment of three keys concluding with a dominant preparation provided practice in writing modulations, it yielded an unacceptable number of haphazard harmonic paths. A better strategy would be to specify a plan: for example, a tonal trajectory starting in the dominant or relative major key, moving through a series of descending fifths or thirds to arrive on a structural predominant, and then onward to the dominant preparation. (Students should further be advised to avoid reconfirming the tonic as a structural key if encountered along the way.) In another scenario, students might analyze an existing development and use it as the model.

The project did not address temporal issues. This resulted in such weaknesses as long elaborate transitions between simple themes, short developments barely meeting the harmonic requirements of the assignment, awkward phrase lengths, and inappropriate harmonic rhythms. With more time, more attention should be devoted to helping students balance and link phrases to create the flow of a real composition.

Matters of style beyond the general description of "classical" were not addressed. The singable traits of the sight-singing melodies predisposed sonatas to be of medium tempo, pleasant, and tuneful. Themes chosen instead from piano scores would lead toward more pianistic compositions. An enthusiastic class might even focus on emulating the style traits of a particular composer.

Throughout the project the instructor will need to motivate and encourage timid students while moderating the flamboyant tendencies of the overly-motivated, continually reminding everybody that the goal is to understand sonata form, not to compose a masterpiece. The project focuses on the differing functions of the component sections of classical sonata form. Its purpose is not to

produce perfect compositions, but to provide experience in working with basic formal elements, cultivating thereby a thoughtful appreciation for the masterpieces of sonata repertory.

CODA

The completed sonata movement concluded the class assignment. That would have been the end of the story, except that the Vermont Academy of Arts and Sciences soon thereafter announced its annual Intercollegiate Student Symposium. The call for papers included, along with instructions for scholars in scientific and humanities areas, an invitation for musicians to submit scores and recordings of original compositions.

While ours was a music theory class (and not technically composition), I felt that the students' efforts at composition and some of their resulting sonatas were worthy of recognition. I proposed to the class that anyone who had fared well on the assignment might like to consider the possibility of presenting at a scholarly conference. Three students volunteered. We subsequently met in office hours weekly for the next month or so, preparing a conference proposal and abstract, correcting any remaining part-writing or spelling mistakes in their scores, producing either computer-printed or neatly hand-written manuscripts, writing a text for the oral conference presentation explaining the project to a scholarly but non-musical audience, preparing overhead projector transparencies of scores, and recording CD performances of their pieces. They rehearsed their collaborative presentation for our theory class and two guest theory professors, receiving critiques and sample questions they might encounter from the conference audience.

The conference was a grand success. The students' rather unusual presentation (featuring not only scholarly work but also musical entertainment) was scheduled as the leadoff event, in plenary session, immediately following opening remarks by the Provost of the host institution and the President of the Vermont Academy of Arts and Sciences. The students fielded numerous questions after their formal presentation, and audience members continued seeking them out during the day with further questions, compliments and conversation. They clearly captured the attention and admiration of other students and professors alike.



Striking the Right Chord (or applying first aid to the wrong one) in the Day of a Theory Teacher

Dorothy Payne

As a grateful and deeply honored recipient of the third Gail Boyd de Stwolinski Lifetime Teaching award, I am pleased to have been asked to contribute to this issue of the *Journal of Music Theory Pedagogy*. I should also express my gratitude to the Gail Boyd de Stwolinski Center for Music Theory Pedagogy and the School of Music faculty and students for their warm and gracious hospitality during my three-day September residency as a visiting lecturer. It was indeed a rewarding experience in every way and has greatly increased my already considerable admiration for the Center's pioneering work. The above title was suggested by the Director of the Center for my September 20th lecture at the University, and since I rather fancied it, I am revisiting it for this article.

My approach will be informal, very personal, somewhat eclectic, and will draw upon the wisdom of others with whom I have crossed paths. I wish to pay tribute here to two musician / teachers who have been very influential in my life. One is Michael Rogers, a former faculty member at Oklahoma, whose book *Teaching Approaches in Music Theory* (Southern Illinois Press, now in its second edition) is a veritable treasure trove of pedagogical and philosophical truths, meaningful for any teacher of any subject. The other is the late Janet McGaughey who was my esteemed colleague at the University of Texas for several years. Janet, a musical giant if ever there was one, was at one and the same time homespun and sophisticated, brilliant and humble, energetic and contemplative, and possessed of truly amazing aural acuity. It was a joy and a privilege to be her colleague.

I suspect and hope that some of my own homespun observations, references, and suggestions will resonate with those of others whose views are represented by readers of, and contributors to, the *Journal of Music Theory Pedagogy*. My remarks are made within the context of a long-standing and passionately held belief that the so-called "music theory" courses found in the basic music major curriculum (embraced by some, dreaded by others, but inevitably inflicted upon

all) represent the most important training an aspiring musician will ever receive. This assumes, of course, that the teaching consistently relates the material presented to the music itself, which inspired the student to pursue his or her craft in the first place.

Clearly the course designation of “music theory” is a misnomer in terms of what goes on in the lower division classes. The term “musicianship” comes somewhat closer to describing the goal we seek. There is nothing “theoretical” or indeed “creative” about mastering scales, intervals, chords, and key signatures. At the same time, these fundamentals must be firmly ingrained before the creative and exciting process of becoming an enlightened musician can begin. Music literacy requires both skill and knowledge. Whereas skill allows a musician to perform with facility, knowledge makes it possible to perform with insight.

Beginning on a somewhat irreverent pedagogical note, I wish to share with you an excerpt from a speech by one of my all-time heroes, the late, great Robert Shaw. I was fortunate enough to secure a copy of an unpublished speech presented at a 1955 meeting of the Music Teachers National Association in St. Louis. This remarkable and eminently lovable musician was also blessed with an impish sense of humor. In alluding to an earlier speech delivered to the Music Educators National Conference, also in St. Louis, Shaw offers the following observations:

There are differences between the present occasion and that earlier one. The first is the difference of auspices. That one was in conjunction with a conference of music educators, and this one I understand is with a convention of music teachers. On the flight out I was trying to figure the difference between the two, but since arriving, I have noticed the agendas abound in “critical-analytical orientations” and “diagnostic and therapeutic implications,” and it has rather knocked my theories into a mortar board.

I figured that a teacher was one who taught that which he knew, while an educator was a person who was so well qualified that he could teach anything, even that which he didn’t know. Education, in essence, is the science of getting there first – without necessarily anything at all. The reason education is necessary is because some people

just don't want to learn anything. A person who wants to know something can be "taught," but a child who doesn't want to know anything at all has to be "educated."¹

The question of what should be considered essential in an undergraduate theory curriculum continues to be a challenging one, particularly since the arrival of CMP on the scene with its exciting and sometimes daunting breadth. It brings to mind a memorable presentation at an NASM meeting in 1987. Many of you will know the name of Donald Harris, a composer who, immediately before his retirement, was Dean of Fine Arts at Ohio State University. Don's presentation, entitled "Predicting the Future," postulates a fictitious NASM meeting that might have been held in 1787 (200 years earlier). The deans of music schools who were attending the meeting would likely have been in their fifties, and would have not only experienced the improvisation of the great J. S. Bach at the Thomaskirche, but also the premiere of *Don Giovanni* in 1787. As they met to discuss issues relative to their programs and curricula, questions would undoubtedly have been raised about the problem of putting clarinet teachers on tenure tracks, since no one had any assurance that this instrument would stand the test of time; what should we do with students demanding to be taught the piano, when we had so many tenured but under-subscribed harpsichord teachers on the faculty; how might we solve the unending problems of equal temperament; and should we be teaching our students to write fugues and cantatas, or symphonies and sonatas. Harris (a student of Nadia Boulanger), alluding to the clear analogies to be drawn, suggests: *La plus ça change, la plus c'est la même chose* ("The more things change, the more they stay the same."). He then concludes by observing that rather than trying to predict the future (which we of course cannot), "we should rather fulfill our responsibilities as educators to provide a willing, receptive, and comfortable climate for learning, one that is neither prescriptive nor preemptive. Far more important than predictions of what will take place in the future is the simple fact that we need to provide forums for the free investigation of creative thought, the very nature of which is unpredictable."²

¹ Robert Shaw, unpublished lecture presented at the MTNA meeting in St. Louis, February 14, 1955.

² Donald Harris, *Proceedings of the 64th Annual Meeting of NASM*, pp. 30-35

I commend to your attention the thoughtful article by Robert Gauldin, found in volume 17 (2003) of *JMTP*. Not only was Bob my predecessor as recipient of the de Stwolinski Prize, but he also served as departmental chair during my ten years as a member of the Eastman theory faculty. His article, entitled “Some Personal Reflections On Past Methods of Teaching And What They Can Tell Us About Current And Future Initiatives,” traces pedagogical practices in music theory during the last half-century, as well as providing observations and commentary on current directions in the field. As a master teacher himself, Gauldin reinforces my conviction that one should never take the mastery of fundamentals for granted. Freshly-minted teaching assistants are often lulled into thinking that fundamentals are easy to teach—after all, they are so basic—while young students are inclined to take them less seriously because they can be—well, boring. Also, young musicians’ priorities usually center around time spent in the piano practice room or the voice studio, preparing for that future national competition or Met audition. This being the case, I have chosen to share a few favorite teaching techniques as well as some observations.

As an example, I routinely conduct a speed drill on key signatures during the first class meeting of a freshman or sophomore course. I set a tempo in four-four time, give them a key on beat 1, a free beat, and they respond on beats 3 & 4 (with varying degrees of unanimity). For example: “F# – beat – six sharps; B – beat – 5 sharps, etc.” When I switch to minor keys, one hears a low groan throughout the room and a concomitant drop in unanimity of responses. Since this is a group activity, it usually does not traumatize the students, but it does alert them to the fact that they won’t have five minutes to figure out these things when dealing with “real” music. By the way, you are probably aware that there is a dangerous myth out there that as long as you can do everything in C major, you are fine. The same myth suggests that minor scales are much harder than major scales. I urge you to get into the habit (if you are not already doing that) of shunning C major whenever possible, and trying to revel in the idiosyncrasies of the minor mode every chance you get. The same type of speed drill is helpful with isolated triads of various types, especially spelling them from the fifth down, or using inversions to avoid always building from the root. Seventh chords of course create a whole new set of challenges. The philosophy here is to take your students off of “automatic pilot” by adding a level of difficulty to what is otherwise a routine and somewhat mechanical exercise,

thereby forcing the brain (we hope) to get into the act.

Remarkably enough, one common (and vexing) mistake made by students in taking dictation is that of confusing scale degrees 1-2-3 with 1-3-5. I suspect some of you have encountered that phenomenon; I surely don't want to think it is a musical malady confined to South Carolina. I have made use of a little exercise involving "My Country 'Tis of Thee" (or "God Save the Queen"). The students are asked to sing the tune with scale degree numbers (or solfège syllables) but with the following caveat: they are to sing aloud *only* scale degrees 1-3-5 when they occur, while silently audiating the others. The teacher provides appropriate harmony but without playing the melody notes themselves. It can be a challenging exercise, especially when the situation is reversed and students sing only the "other" notes, *omitting* 1-3-5.

I confess to being most interested in the early development of music literacy, and especially ear-training skills. Although I am not an official card-carrying Dalcrozian, I have adopted a number of ideas from Emile Jacques Dalcroze whose work in this area was seminal. The above exercise, for example, reflects some of the principles touted by Dalcroze. At the time he taught at the Geneva Conservatory, the only students admitted were those with perfect pitch and extraordinary performance abilities. The Dalcroze method is in some ways an earlier manifestation of the thrust toward comprehensive musicianship. CMP courses have sought to synthesize and relate experiences in composition, performance, analytical listening, and theory. Dalcroze saw the weakness in separation of musical studies as do we. He planned for the development of a kind of musicianship that included not only accurate performance of the musical score, but a sensitive expression of all the interpretive elements of the music: dynamics, phrasing, nuances, and shading. Improvisation constitutes an important part of the training as well. Eurhythmics, the only entirely new subject in the Dalcroze method, has always been associated with the name of Dalcroze and is frequently considered as the sole area of study in his method.³

Dalcroze stated that "Education does not consist of creating faculties which the pupil does not possess, but rather enabling him to obtain the utmost possible benefit from those he does possess."

³ Beth Landis and Polly Carder, *The Eclectic Curriculum in Music Education: Contributions of Dalcroze, Kodaly, and Orff* (Music Educators National Conference, 1972), 8.

The method is designed to develop the ability (1) to act rapidly, as well as refrain from acting too rapidly; to act slowly, as well as refrain from acting too slowly; to pick up a habit fast, and drop it again with equal rapidity; to make a rapid response to a question; and to concentrate at length.⁴

A simple exercise might involve the following activity. The teacher performs a 4/4 measure of music; in the next measure the students imitate the rhythmic pattern by clapping. A second measure with different rhythm is played, then clapped by students, followed by three or four different patterns. Then the teacher initiates a rhythmic canon, i.e., as the students are clapping a given measure, the teacher is playing the following measure (perhaps the same, perhaps different) so that the student is always clapping a measure and listening simultaneously to the measure that lies ahead. If space permits, having the students “walk” the rhythmic patterns is challenging and usually fun.

Another typical “Dalcrozian” exercise might involve the folk song “Frere Jacques.” After having students sing it through with scale degree numbers or solfège syllables, divide the group in half. Have group #1 sing the odd-numbered measures in C major, while the even-numbered measures will be sung in C minor. Next: have group #1 sing odd-numbered measures in C while group #2 sings even-numbered measures in the key of E-flat major! This provides some interesting challenges (and it is fair to trade off keys between the two groups). Now have both groups sing the piece through together in the keys of C and E-flat simultaneously. You might even live dangerously and divide into three groups, the added group performing in G major (or perhaps a more exotic key). Finally try “passing the tune” around by having each class member sing a quarter note beat; a rest or extended note gets a clap. This challenging exercise helps develop the critical ability to provide a rapid response.

The above exercises involve a kinesthetic awareness of the process, an important component of the Dalcroze method. Edwin Gordon refers to the critical importance of this physical involvement in the learning activity and its effect on rhythmic and musical understanding as he states:

⁴Marie-Laure Bachmann, *Dalcroze Today* (Oxford: Clarendon Press, 1991), 87.

The theory of music is to a practical musician what the theory of electricity is to a competent electrician. Neither the musician nor the electrician necessarily needs to know or use the information that theory provides. Without theoretical understanding, one could still intelligently read, write, and listen to music. It seems odd, therefore, that some music educators stress the theory of music at an early stage of students' musical achievement...theoretical understanding is NOT a readiness for music reading, as some music educators believe. Indeed it is pernicious for a student to engage in the discipline of music theory without first demonstrating aural/oral understanding. Such an activity can only result in the solving of music crossword puzzles and the excessive memorization of rules.⁵

A comparable philosophy was articulated by William Schuman in his introduction to *The Juilliard Report* published in 1953 during his presidency there. He states:

During the years that I taught at Sarah Lawrence College, I learned very quickly that for education to be meaningful, the student has to undergo an emotionally valid experience. While I am not qualified to know whether such a statement applies to other fields, in music the absence of a "felt" reaction means that the composition, even if its techniques were understood, did not "register" with the student...this should not be construed to mean that the study of music can be a non-intellectual pursuit – an emotional bath – but rather that "feeling" includes the sensed application of all intellectual data to the living organism of the art.⁶

Having been trained as a pianist, I feel strongly about the importance of basic piano skills as a critically important foundation for the study of musicianship. With very few notable exceptions, one finds that the traditional keyboard harmony component of the undergraduate musicianship core has significantly dwindled during the last few decades, and in some cases, disappeared

⁵ Edwin Gordon, *Learning Sequences in Music* (Chicago: GIA Publications, Inc., 1993), 101

⁶ William Schuman, *The Juilliard Report* (New York, 1953), Introduction

altogether. It may well be an inevitable casualty of the broadening of subject matter that came along with comprehensive musicianship, in which the prescribed breadth of coverage made concomitant skill development virtually impossible. Having begun my teaching career more than thirty years ago, I am keenly aware of the depth of learning and musical literacy which has somehow been diminished along the way. I will add parenthetically that during those years one could reasonably assume at least a passing acquaintance with, say, the Beethoven Fifth Symphony. That is no longer the case, a fact that exacerbates the problem of helping the student relate the course content to milestones of music literature.

In years past, there were varying mechanisms for incorporating keyboard harmony into the curriculum. In larger and/or more specialized institutions, there was an independent keyboard harmony course. In other cases, the teaching of keyboard harmony was left up to the class piano instructor and often failed to complement the work taking place in the theory classroom. Those institutions having an integrated core combining harmony, analysis, ear training and sight singing, might schedule a ten-minute keyboard "audition" with a graduate assistant once a week. The exercise to be performed would ideally reflect material being dealt with in the regular class meetings.

I am reminded of a particularly challenging assignment devised by the coordinator of sophomore theory classes, while I was serving as a graduate teaching assistant. The acceptable literature for study at that time, and at that particular institution, was limited to the chorales of J. S. Bach (not atypical of many music programs during the first half of the century), and the topic at hand was "the suspension." The assignment was memorable, not only because of the howls of protest which it elicited from the students, but also because of the quantum leap in written and aural skills which took place immediately after its completion. The students, including "non-pianists," were asked to perform at the keyboard the first phrase of the chorale *Danket dem Herren, denn er ist sehr freundlich*; which is a veritable treasure trove of suspension usage; and be prepared to play the work not only in its original key of a minor, but also in the keys of g minor and b minor.

I mention the foregoing example without in any way suggesting that it would be appropriate (or even possible) for today's typical sophomore theory classes, but merely to cite one example of the background study and prior experience that some of us took for

granted. It must of course be noted that many of today's entering students bring with them different kinds of skills and experiences, and have often developed keen listening abilities, although perhaps not in the more traditional sense. It is important for us, as teachers, to acknowledge and respect their accomplishments, while at the same time seeking to inculcate them with what we believe to be enduring musical truths.

I have alluded briefly to the study of improvisation as an important tenet of the Dalcroze method. While it is expected that our students will gain experience with both improvisation and composition in the course of their baccalaureate study, there is something that causes some of us to feel uneasy about taking on this challenge. There are many reasons for this, not the least of which is our tendency to associate the term exclusively with jazz. We need to keep in mind, however, that our jazz majors often develop their improvisatory skills by painstakingly transcribing recorded improvisations by renowned jazz artists and using these as a springboard for their own creative efforts. This technique is also a time-honored tradition among those engaged in more classically oriented improvisation. Gerre Hancock, former organist at St. Thomas Church in New York, and renowned as a masterful improviser as well as a virtuoso performer, has written a book titled *Improvising: How to Master the Art*. He discusses the importance of studying model pieces by favorite composers, writing out a personal adaptation in both musical and nonmusical outlines, and then practicing, at the keyboard, what you have written down. Hancock goes on to say: "In the end, improvisation cannot really be taught but only suggested. The musician becomes his or her own teacher." ⁷

Improvisation skills as an aid to memorization, along with other topics, are presented in *Mapping Music: For Faster Learning and Secure Memory*, by Rebecca Shockley. The techniques described in her book and frequently featured at workshops here and abroad reflect the above philosophy and have proved particularly effective in strengthening confidence in performance.⁸

Whatever the subject matter may be, one essential quality that

⁷ Gerre Hancock, *Improvising: How to Master the Art* (New York: Oxford University Press, 1994), viii.

⁸ Rebecca Shockley, *Mapping Music: For Faster learning and Secure Memory* (Madison, Wisconsin: A-R Editions, Inc. 1997).

seems to characterize successful teachers of almost anything is that of “prizing the student.” Obviously this was the approach for Gail Boyd de Stwolinski (or “Dr. De” as she was referred to following the completion of her PhD). Carl Rogers, in his book *A Way of Being*, describes such an involved teacher as:

One who can accept students’ occasional apathy, their erratic desire to explore by roads of knowledge, as well as their disciplined efforts to achieve major goals. When the teacher has the ability to understand each student’s reactions from the inside, then the likelihood that significant learning will take place is increased. This kind of understanding is sharply different from the usual evaluative understanding, which follows the pattern of, “I understand what is wrong with you.” When the student does not feel as if he/she is being analyzed or judged, successful learning is much more likely to take place.⁹

Along with these observations which have guided my own teaching philosophy, I would also offer this caveat: a teacher should always try to teach to his or her strengths and in a style of presentation that feels comfortable. While it may be tempting to try and replicate the teaching techniques of a master teacher you have observed, you may be less effective in the classroom or studio than you would, were you to select or devise particular techniques and approaches that resonate within you and cause your own creative juices to flow. That does not mean that you cannot benefit greatly from adopting ideas from some of the fine teachers that are in the field today, but just to suggest that the more comfortable you are, the richer the experience will be for your students.

Insofar as possible, it is essential that we take each student from where he/she is at the time, and move forward from that stage to allow the student to develop his/her abilities to the fullest, realizing of course that all will not necessarily achieve that same level of accomplishment. Often, however, it is those students who have struggled with a subject who, upon achieving success, are better qualified to teach it to others because of having overcome their own challenges.

9 Carl Rogers, *Away of Being* (Boston: Houghton Mifflin Co., 1980), 272.

We also need to remind students of the critical role played by the arts in developing the whole person, one who is prepared to make a significant contribution to society, whether or not he/she chooses (or is qualified) to pursue music as a profession. We should model a willingness to take chances with new ideas and approaches and (perhaps most important) maintain a sense of humor, determining not to take ourselves too seriously.

I would like to close with remarks by the late Robert Trotter, a seminal figure in the CMP movement and revered pedagogue, who said:

I try to develop in myself and my students “indispensable musicianship.” This phrase means to me: developing modest competence in performance, composition, and perceptive listening, along with a desire and ability to relate all three to each other and to all of life. If we aim at developing indispensable musicianship in ourselves and our students, we can make it; to aim at less is to be irresponsible, bored and boring.¹⁰

¹⁰ Transcript of informal spoken comments at a meeting of students and faculty during a workshop held at the Eastman School, June, 1969



A Comparative Review of *The Complete Musician* by Steven G. Laitz, *Harmony in Context* by Miguel Roig-Francolí, and *The Musician's Guide to Theory and Analysis* by Jane Piper Clendinning and Elizabeth West Marvin

Don Traut

The last twenty years have seen a rapid metamorphosis in undergraduate music theory textbooks. One trend, undoubtedly inspired by the seminal work of Edward Aldwell and Carl Schachter, has been to incorporate Schenkerian philosophy and analytical techniques.¹ As Schenkerian methods have become more pervasive, some pedagogues have devoted their attention to barriers that have historically separated the various facets of music theory pedagogy. The textbooks under review represent the most recent efforts to level these barriers by the integration of written work, listening, and ear training. (The continuing influence of the Contemporary Music Project of the 1960's and its emphasis upon "comprehensive musicianship" is remarkable.) Texts comprising the focus of this review are *The Complete Musician: An Integrated Approach to Tonal Theory, Analysis, and Listening* by Steven G. Laitz, *Harmony in Context* by Miguel Roig-Francolí, and *The Musician's Guide to Theory and Analysis* by Jane Piper Clendinning and Elizabeth West Marvin.² This review follows (roughly) the layout of each publication, with

Editor's note: Ordinarily the journal would not review the work of its Editorial Review Board. The former editor contracted this review before Don Traut, Steven Laitz, and Miguel Roig-Francolí were invited to serve. With publication there is an implicit assurance by the current editor that neither professor Laitz nor Roig-Francolí read the review before publication. Neither was professor Clendinning (outgoing Reviews Editor) nor professor Marvin (former ERB member) privy to the review. JMTP is fortunate to have on its ERB sufficient pedagogical depth as to make such contexts difficult to avoid, and, in rare instances, understandable.

¹ Edward Aldwell and Carl Schachter, *Harmony and Voice Leading* (New York: Harcourt Brace and Jovanovich, 1989).

² Steven G. Laitz, *The Complete Musician: An Integrated Approach to Tonal Theory, Analysis, and Listening* (Oxford: Oxford University Press, 2003); Miguel A. Roig-Francolí, *Harmony in Context* (New York: McGraw-Hill, 2003); Jane Piper Clendinning and Elizabeth West Marvin, *A Musician's Guide to Theory and Analysis* (New York: W. W. Norton & Company, 2005).

assessment of their various approaches to fundamentals, diatonic harmony, form, chromaticism, and extended harmonic techniques.

PART 1: FUNDAMENTALS

Each of these packages provides for thorough coverage of rudimentary pitch and rhythm materials, including ample assignments on each topic.³ Every text presents sufficient material for an eight to ten week fundamentals unit, but programs requiring longer exposure to the rudiments may find it necessary to employ supplementary materials.

Of the three, the introductory portion of *Harmony in Context* provides for the fullest range of simple to most challenging pitch and rhythmic drills. *Harmony in Context* is also notable for its singular approach to the teaching of intervals, by semitones, before the introduction of scales. The presumed outcome of this order is that students (arguably) become as fluent with augmented and diminished qualities as they do with the major, minor, and perfect. Both *The Complete Musician* and *The Musician's Guide* contextualize intervals in scales, emphasizing diatonic to the potential detriment of non-diatonic qualities. Much the same can be said with respect to Roig-Francolí's approach to meter, which contains more asymmetric examples.

Especially welcome is the strategy taken by every author to introduce species counterpoint, in two voices, early in the curriculum. In each case this material follows an explanation of the relative consonance and dissonance associated with each interval. While every author pays homage to Fux, each tolerates varying degrees of license with respect to strict species. Steven Laitz's *Complete Musician* covers first and second species, requiring students to analyze and label the generic intervals formed between the two parts: a nice set-up for figured bass exercises. Roig-Francolí's *Harmony in Context* adds the fourth species in two voices, employing Fux's *cantus firmi* as points of departure. Having introduced the church modes, Roig-Francolí is also poised to exploit the modal *cantus firmus*, allowing for the explanation of Phrygian cadences and modal key signatures in Bach chorales. While Clendinning and Marvin's *Musician's Guide* incorporates more species (first through fourth), their approach is less strict than that of Fux. They write:

³ I have used the term "package" because each publication includes materials supplementary to the textbook. See Part 5: Workbook and other Supplemental Materials.

⁴ Piper Clendinning and West Marvin, *Musician's Guide*, 136

For example, while Fux restricts first species to consonant intervals only, we will learn how to connect consonances with chordal dissonances. We will also use tonal endings in our contrapuntal writing, rather than the modal endings of traditional first species.⁴

(a) O P C P P P O C C O C C O S

(b) O C C P C S - C C C P C O C

Example 1: Jane Piper Clendinning and Elizabeth West Marvin, *The Musician's Guide to Theory and Analysis*, p. 145

By relaxing these rules, the authors allow for outer-voice formations and rhythmic patterns more typical of tonal writing. This is seen in their two settings of “My Country ‘Tis of Thee” shown in Example 1. In addition to the mix of quarter and eighth-note values, each of these settings ends with an implied V6/4-5/3–I progression. While these types of formations may frustrate purists, they do stress the importance of outer-voice counterpoint, an important preliminary step to the pedagogy of four-voice writing.

PART 2: DIATONIC HARMONY

While each text emphasizes contrapuntal elaboration of large-scale harmonic functions, they approach this and other Schenkerian concepts somewhat differently. In Part 2 of *The Complete Musician*, “Tonic and Dominant Expanded,” Steven Laitz presents one of his overriding tenets: “simple processes underlie all tonal music, and are simply fleshed out in wondrously diverse contexts.”⁵ Laitz

① V_3^4 neighboring tones → neighboring chord soprano (N) → passing chord and neighboring soprano passing tones → passing chord NB. bass and soprano in 10th $V_3^4 + 6$ double neighbors → double neighbor chords

② V_3^4 ③ P ④ DN DN

I — I V_3^4 I I — 6 I V_3^4 I⁶ I — 6 I V_3^4 I⁶ I — 6 I — I V_3^4 V_5^6 I

E.

① V_2^4 as bass passing tone ② neighboring tones → neighboring chord ③ incomplete neighbor with passing tone → incomplete neighbor chord with passing tone

① P ② N ③ IN ④ IN

V_2^4 I⁶ I⁶ — I⁶ V_2^4 I⁶ I — 6 I — I V_2^4 I⁶ I — 6

volpe exchange

Example 2: Steven G. Laitz, *The Complete Musician*, p. 166

substantiates this maxim in numerous drills of short patterns, or expansion figures, as shown in Example 2. The purpose of these drills is to demonstrate how non-harmonic tones become embellishing chords. Whereas Roman numerals identify the chords in each case, “second-level analysis” interprets each chord contextually as a tonic expansion. These tools enable the author to distinguish contrapuntal expansions (typically inverted sonorities that prolong harmonic areas) from functional harmonic progressions (usually root-position or strong, deep-level harmonies). While such

⁵ Laitz, *Complete Musician*, xvii.

attention to detail could be cumbersome in larger analytic excerpts, the system does get students interpreting (and hearing!) chords in groups.

The Complete Musician continues to develop the ideas of expansion and harmonic progression in Part 3 where Laitz shows how the “phrase model” (i.e., T-Pd-D-T) accounts for the remaining diatonic harmonies and the formation of musical phrases. Part 4 progresses to still larger periodic and sequential structures. Laitz’s take on sequences is noteworthy. As a slight revision to the descending fifths sequence, he notes that the two-chord model formed by the descending fifth is actually copied a descending second from the original (i.e., C-F, B-E, etc). Thus the sequence is called “Descending Seconds” (D2), with the descending fifth root motion recognized as part of its internal structure.⁶ He also displays an eye for detail when asking for labels representing whether or not the sequence has interlocking or alternating seventh chords and/or applied chords. (One possible label would be “D2(D5xA4) w/ applied 7ths interlocking”.)

Roig-Francolí’s *Harmony in Context* features the most exhaustive use of Schenkerian principles, employing harmonic reduction (i.e., voice-leading reduction), which the author defines as “a nonmetrical representation of harmonic motion and harmonic hierarchy in a musical passage.”⁷ His reductions have three clearly stated goals:

A prolongational reductive graph should clearly show (1) the pitches that have a structural function and those that have a prolongational role, (2) the extent of the prolongation, and (3) the specific prolongational technique used in a particular passage.⁸

⁶Laitz’s full label for a sequence moving C-F, B-E would be D2(D5xA4). As mentioned above, the D2 signifies the model/copy relationship. The D5xA4 refers to the internal root motion: descending fifth followed by ascending fourth. This label has the potential to confuse the important distinction between root-motion intervals (D5) and pitch intervals (A4). For an excellent discussion of issues surrounding sequences and pedagogy, see Adam Ricci, “A Classification Scheme for Harmonic Sequences,” *Theory and Practice* 27 (2002): 1-27.

⁷ Roig-Francolí, *Harmony in Context*, 162.

⁸ Ibid.

The image shows two systems of musical notation, labeled 'a.' and 'b.', within a single staff. System 'a.' consists of two measures of music in 4/4 time, with a key signature of one sharp (F#). The notes are: Measure 1: Treble clef has A4, G4, F#4; Bass clef has F#3, E3, D3. Measure 2: Treble clef has G4, F#4, E4; Bass clef has E3, D3, C3. Below system 'a.' is the harmonic function notation: AM: I V₆ I I₆ IV V I IV I. System 'b.' consists of two measures. The first measure has a treble clef with notes A4, G4, F#4 and a bass clef with notes F#3, E3, D3. The second measure has a treble clef with notes G4, F#4, E4 and a bass clef with notes E3, D3, C3. Above the first measure of system 'b.' is the label 'PT'. Below system 'b.' is the harmonic function notation: I — 6 6 IV V I. The numbers 6 and 6 are connected by a horizontal line.

Example 3: Miguel Roig-Francolí, *Harmony in Context*, p. 205

Example 3 shows how this notation is incorporated into the text, highlighting the linear function of inverted chords. In the next chapter, chords are grouped into one of three functions. Structural chords are those that can have a beginning or ending function within musical units (only I and V). Predominant chords have the function of preparing the dominant. Prolongational chords have the function of extending the structural frame in time or of extending other nonstructural chords (179). Students are instructed to use these categories and graphic notation to create reductions of their figured bass exercises. While this is an ambitious undertaking, Roig-Francolí is clear and consistent in his use of reductive symbols. Later in the book he introduces bass-line sketches, a more practical approach when it comes to longer pieces.

Miguel Roig-Francolí is also to be commended for his consistent effort to contextualize chords and their harmonic functions by interjecting related concepts that stimulate interest. Chapters 1-4 introduce the harmonic fundamentals: general principles of harmonic progression, tonic and dominant in root position, the subdominant and triads in first inversion. From there his attention turns to formal units. A chapter on cadences precedes two chapters on melodic organization, which cover periods, bass reductions, and the technique of interruption. Placing these topics near the beginning opens the door for a greater range of literature study and the potential for composition assignments. The remainder of Part 1 covers all the necessary bases. Chapters devoted to nonchord tones and six-four chords are methodical and complete. A chapter titled, "Harmonic Rhythm; Hypermeter," gives much needed attention to these elusive topics. Some may find the late arrival of dominant seventh chords and their inversions (chapter 12) to be problematic, but this does not undermine the overall effectiveness of this portion of the text.

Schenkerian influence is the least overt in Clendinning and Marvin's *Musician's Guide*. There are no reductions or graphic notations. Instead, the authors use the over-arching concept of "the phrase model"—comprised of tonic, dominant, and tonic closure—to illustrate how various chords can expand harmonic areas. This allows for a more fluid presentation of specific chords, as seen in Chapter 16, which begins with various ways to expand tonic, including motion to the submediant, 5-6 motion, motion to the subdominant, and inversions of the V7. While the authors use terms like "expansion" and "prolongation," they have opted not to employ the graphic notation techniques exploited by Roig-Francolí and Laitz.

In addition to its presentational style, various pedagogical approaches of *The Musician's Guide* distinguish it from the other texts comprising the focus of this review. Where appropriate, Clendinning and Marvin champion composition as the preferred methodology for internalizing concepts, with one section devoted to folk song harmonization and another to how a four-part setting can be adapted to a piano texture. The creative emphasis is especially evident in Chapter 21 where students are instructed to use applied chords, compositionally, to provide temporary harmonic diversion, or create forward motion, or evade an expected resolution. The compositional accent engages students in a decidedly active and creative approach to learning.

PART 3. FORM, CHROMATICISM, AND BEYOND

All three texts contain excellent presentations of the major forms of tonal music. Predictably, each begins with binary and ternary song forms and progresses to sonata and rondo. Whereas Laitz and Clendinning/Marvin employ the traditional terminology of sectional vs. continuous and simple/rounded/balanced, Miguel Roig-Francolí uses "tonal types" to identify binaries by harmonic traits of the first reprise: I-type, V-type, or III-type. While these labels adequately describe the repertoire, some students may find them restrictive, too specific to reinforce general notions of harmonically open or closed units.

Part 7 of *The Complete Musician* devotes chapters to ternary, rondo, and sonata forms. In lieu of an anthology, Steven Laitz has reproduced complete scores and analytic comments in the text itself.

These include the third movement of Beethoven's Piano Sonata, Op. 2, No. 1 (ternary), the *Urlicht* from Mahler's Second Symphony (ternary), an air by Francois Couperin (rondo), the Handel aria *Vaghe pupille* from *Orlando* (rondo), and the first movement of Mozart's Piano Sonata, K. 333 (sonata).

Part V of Clendinning and Marvin's *Musician's Guide* is titled "Musical Form and Interpretation." A unit on song forms covers early twentieth-century American popular song and the nineteenth-century German lied. Clendinning and Marvin's disposition toward stylistic variety is revealed by their inclusion of quaternary and verse-refrain forms, added sixth and ninth chords, pentatonic and blues scales, twelve-bar blues, "sus" chords, and pop chord symbols. The pages devoted to variation are especially thorough, including techniques for sectional, figural, chromatic, character/stylistic, textural/timbral, and continuous variation. The chapter continues with exploration of performance idioms, and concludes with a very short section on rondo.

Each package supplies varying amounts of material for study beyond the fourth semester. Laitz's *Complete Musician* offers units on modal mixture, equal divisions of the octave, chromatic sequences, and the move toward symmetry in the late-eighteenth century. Appropriately titled "At Tonality's Edge," his final chapter ventures into "intervallic cells" as unifying principles, with examples from Brahms and Scriabin.

Roig-Francolí's *Harmony in Context* projects the discussion further into the twentieth century with a chapter on "Nonfunctional Pitch Centricity," to my knowledge the first instance of neo-Riemannian *Tonnetz* and the PLR model in a book of undergraduate scope. Whether or not instructors use this section, Roig-Francolí deserves accolades for a thorough presentation of the concept. *Harmony in Context* concludes with sections on nonfunctional diatonic collections (pentatonic and quartal harmonies), and symmetrical scales (primarily whole tone and octatonic).

The Musician's Guide provides by far the most material for the study of twentieth-century music. The whole of part VI, "Into the Twentieth Century," introduces set-class theory and serialism, usually covered in an introductory course on this material. Clendinning and Marvin develop the analytical techniques of integer notation, interval class vectors, normal order and prime forms, matrices, hexachordal combinatoriality, the set-class table (appendix), and more. Contemporary rhythmic and other features

receive attention as well, including variable and polymeter, additive rhythm, metric modulation, and graphic notation. A section on developments in form focuses on minimalism and phasing, moment form, and indeterminacy. Their combination of topics, pieces, and exercises easily comprises sufficient material for a fifth semester.

PART 4: WORKBOOK AND OTHER SUPPLEMENTAL MATERIALS

Each package includes a workbook, recordings, and teacher's manual. Whereas the anthology for *Harmony in Context* is included in its workbook, *The Musician's Guide* offers the workbook and anthology separately bound. *The Complete Musician* anthologizes complete works in both its text and workbook (particularly in its chapters on form). Every workbook contains exercises for each chapter of the text, including a nice mix of shorter drills (spelling chords, etc.), longer exercises (figured bass and harmonic analysis), and analysis of musical examples. In every chapter of its substantial workbook, *The Musician's Guide* organizes student activities around what the authors call "Basic Elements, Writing Exercises," and "Analysis." The recordings are of good quality.

Every author has adopted a similar approach to the presentation of concepts (in the text), problems where instructors can check for comprehension (also in the text), and additional materials for homework (in the workbook). The middle step—checking for comprehension—is facilitated by exercises in the body, and at the end, of each chapter. Textbook problems are of the same type and difficulty as students might expect to encounter in the workbook. *Harmony in Context* features "Worksheets" in the textbook. "Try it!" exercises in *The Musician's Guide* provide short drills with answers at the book's end. A timely resource, Clendinning and Marvin's WebFacts are designed to: "explain how certain ideas came to be, fill in background for composers and pieces..., or simply [provide] more advanced information."⁹

The anthologies contain repertoire enough that most users will not need to supplement. The anthology to *Harmony in Context* includes 60 entries, a mix of excerpts and complete pieces. In addition to the war-horses, *Harmony in Context* also includes works by Clara Schumann and Maria Theresia von Paradis. The anthology

⁹ Clendinning and Marvin, *Musician's Guide*, xxviii.

for *The Musician's Guide* features some 60 pieces, a third of which are intended for the unit on twentieth-century analysis. This latter anthology also includes works by Gershwin, Sousa, Meredith Willson, and John Barnes Chance.

CONCLUSION

While each author's approach is in some ways unique, they share some common trends. Most noticeable is the inclusion of sufficient materials for four semesters of study. Each author has obviously sought to minimize the need for supplements. Whereas the danger of the 'everything under one roof' approach is that it has the potential to compromise quality, I cannot detect any such compromise. For the most part each book realizes ambitious goals in a clear and comprehensive fashion.

Were I to criticize anything, it would be that each text tends toward overly-exhaustive explanation. As we all know, music is full of exceptions to the rules, and it is this richness that provides grist for some of our most important and interesting discussions. With each book under review, however, the response to anomalies seems to be to add more material and labels, thereby increasing the level of complexity to the potential undermining of opportunities to perceive deviations for what they truly are. Rather than focusing on general underlying principles, the texts sometimes attempt exhaustive presentation of specific realizations of these principles. This is seen, for example, in the countless prolongational figures, numerous binary types, and sequential subtypes of *The Complete Musician*. For seasoned instructors (and more savvy students), such exhaustive labeling can become over-bearing. That said, there are instructors who delight in details and are able to use them to great effect; it is better to have too much material than not enough. So, it is the uniqueness of each author and approach that gives reason to celebrate; each text represents an important and welcome addition to music theory pedagogy. With the right match of program, students, goals, and instructor, any one could be effective.





On Teaching Voice Leading from Perceptual Principles

Letter by David Huron

To the Editor,

In my 2001 article, "Tone and Voice," I provided a detailed account of the perceptual foundations of Western voice-leading practice. "Tone and Voice" summarized half a century of cognitive and perceptual research related to part writing. The article culminates with a derivation of the conventional rules of voice leading: experimentally-supported perceptual principles are used as axioms from which the canon of voice-leading rules is generated.

Over the past several years, a number of theorists have begun to make use of this research in the teaching of voice leading to undergraduate music students. Many students find the rules of voice leading arbitrary and enigmatic, and many instructors are uncomfortable with the traditional pedagogical approach in which the rules are treated as inviolable commandments that are not open to discussion or challenge.

Asking students to follow a set of rules without presenting a cogent rationale has the predictable consequence of generating suspicion and resistance. Since there are perfectly good musical situations where the rules of voice leading can be transgressed (with fine musical results), students of music are right to question why they should follow such an old-fashioned system.

An attraction for some instructors is that "Tone and Voice" provides an alternative to the traditional "authoritarian" pedagogical approach in teaching voice leading. This attraction notwithstanding, I have become concerned about the use of this research in the teaching of voice leading to undergraduates. Although no formal pedagogical studies have been carried out, the anecdotal evidence provides little grounds for optimism. I would like to share my own, somewhat sobering, pedagogical experiences.

Shortly after submitting "Tone and Voice" for peer review, I began experimenting using the perceptual research in my theory teaching. In 1993 and 1994, I taught voice leading to my first year undergraduate theory class at the University of Waterloo based

on the perceptual principles. I began by identifying the perceptual goals of voice leading. I then explained the various perceptual principles described in "Tone and Voice," and then used these principles to derive the traditional rules (including a few rules that are not normally part of the canon).

Nearly all of my students found the experience confusing. The perceptual principles have a complicated physiological and psychological basis, which is not easy to understand. Many of my music students resisted the idea that physiological aspects of hearing would have any real pertinence to the development of a musical skill. Even students with a more accepting attitude toward the research materials found the principles complicated. More importantly, I found that my students produced notably inferior part writing compared with my many years of teaching voice leading using the conventional approach.

I came away from these experiences humbled. There is an important distinction to be made between explanatory goals and pedagogical goals. While the dozen or so traditional rules of voice leading may seem arbitrary and enigmatic to new students, the rules nevertheless provide remarkably succinct and effective guidelines for students who are struggling to produce good part writing for the first time. In acquiring the craft of voice leading, beginning students seem to do better when they are given strong guidelines: a set of black-and-white rules appears to lead to a more rapid production of satisfactory part writing. When a rule is violated, the student understands that the part writing is "wrong," and is therefore motivated to come up with a better solution that avoids making mistakes.

By contrast, when teaching the perceptual principles, there are no hard-and-fast criteria for "right" or "wrong." Students are consequently left with little sense of priority. When students recognize that a particular passage is "less than optimal," they may feel little motivation to revise the passage than if they view the passage as containing a "mistake."

After two years of pedagogical experimentation, I abandoned the perceptual approach and reluctantly returned to the traditional "rote-application-of-rules" approach to teaching voice leading. However, I did make two permanent curricular changes. In the fourth (and final) semester of our undergraduate theory sequence, I presented a one-week module covering the perceptual foundations of voice leading. The module included a series of

audio demonstrations (making use of the Bregman & Ahad disk) and a simplified presentation of the principles described in "Tone and Voice." This presentation was made to students who already had considerable experience with part writing.

In contrast to my experience with first-year students, the responses of advanced undergraduates to this module were nearly always positive. Having already acquired some facility and confidence with part writing, students were curious about the purpose and function of the voice-leading rules. I have no evidence that this course module contributed to better part writing, but the majority of students reported that the module was intellectually satisfying, and in every class, a handful of students claimed that the module was one of the highlights of their undergraduate music training. I have continued to teach this module to advanced students since 1994.

The second curricular change amounted to a couple of sentences added to our introductory theory course. Before introducing the traditional rules of voice leading, I would simply preface the presentation by telling students that there is an underlying logic to these rules that we will not cover in this course, but that the logic will be explained in the final course in the theory sequence. By telling students that there exists a rational account for these rules, I found that students were much less resistant to learning and applying the rules. This simple prefatory remark seemed to have a considerable facilitating effect on student learning.

In the future, it is possible that introductory courses on voice leading will benefit by employing some of the research insights that have arisen over the past several decades. But my own classroom experience suggests that it may be some time before the research contributes to devising a better pedagogical approach than the rote method that has dominated music instruction for the past three centuries. Nevertheless, there does appear to be a place for the perceptual insights in explaining to advanced music students the psychological foundations for a skill that they have already largely mastered.

David Huron
School of Music
Ohio State University

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CONTRIBUTORS

Gretchen C. Foley is an assistant professor at the University of Nebraska-Lincoln School of Music where she teaches graduate and undergraduate courses in music theory, and musicianship and coordinates the freshman theory program. Dr. Foley received the PhD in systematic musicology from the University of Western Ontario. Her research interests include George Perle's theory of twelve-tone tonality and music theory pedagogy.

David Huron is a professor in the School of Music and at the Center for Cognitive Science at the Ohio State University.

Ryan McClelland is an assistant professor of music theory at the University of Toronto. He has published articles in *Music Theory Spectrum*, *Theory and Practice*, and *Indiana Theory Review*.

Sylvia Parker is a senior lecturer of music at the University of Vermont, where she teaches theory and piano. She performs frequently as solo pianist and ensemble player in the United States and abroad. Her recent theory publications and conference papers address topics of Schenkerian analysis, the music of Bela Bartok, and music theory pedagogy.

Dorothy Payne is currently a professor and former dean of the School of Music at the University of South Carolina. She is co-author, with Stefan Kostka, of *Tonal Harmony with an Introduction to Twentieth-Century Music*, published by McGraw-Hill and now in its fifth edition. In 2004 she was awarded the third biennial Gail Boyd de Stwolinski Prize for Lifetime Achievement in Music Theory Pedagogy and Research. Dr. Payne has received teaching awards from Eastman, The University of Texas, Austin, and South Carolina.

Deborah Rifkin is an assistant professor of music theory at Ithaca College, where she teaches theory and aural skills to undergraduates. She received her PhD from Eastman School of Music in 2000.

Mark Sallmen is a senior lecturer in music theory at the University of Toronto. He teaches the sophomore and junior core theory courses as well as music theory pedagogy, extended tonal techniques, and the theory and analysis of atonal music. His research has focused on the music of Carter, Cabena, Debussy, Schoenberg, and Webern.

Don Traut is an assistant professor at the University of Arizona, where he serves as the Director of Graduate Studies in Music Theory. From 2001-2006 he was on the faculty at the University of North Carolina, Greensboro, where he taught graduate courses and coordinated undergraduate theory instruction. His research focuses mainly on Schenkerian theory, the music of Stravinsky, and popular music.

Diane Urista is an assistant professor of music theory at the Oberlin College Conservatory, where she teaches music theory and aural skills to undergraduates. She received her PhD from Columbia University in 2001.

GUIDELINES FOR CONTRIBUTORS

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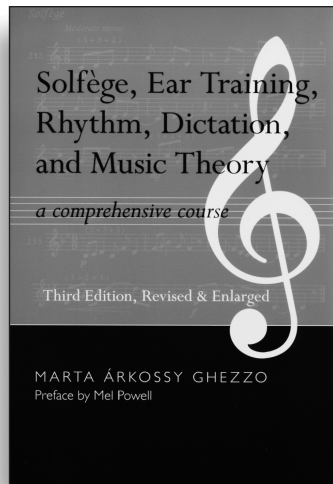
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