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

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Volume 21

The 2006 Gail Boyd de Stwolinski Prize for Lifetime Achievement in Music Theory Teaching and Scholarship

During the November 2006 annual meeting of the Society for Music Theory in Los Angeles, Mary Arlin, Editorial Chair for the *Journal of Music Theory Pedagogy*, made the following announcement on behalf of the Board of Directors of the Gail Boyd de Stwolinski Center for Music Theory Pedagogy at the University of Oklahoma.

For the fourth time, the Gail Boyd de Stwolinski Center for Music Theory Pedagogy has a special announcement to make. The de Stwolinski Center was established in 1985 to provide a clearinghouse for the collection and dissemination of information concerning the teaching and learning of music theory.

Many are more familiar with the de Stwolinski Center through our publication, the *Journal of Music Theory Pedagogy*. Launched in 1987, JMTP has earned an international reputation for quality articles in music theory pedagogy and maintains an impressive subscription list including most major libraries of the world as well as a substantial list of distinguished individual subscribers. Tim Smith of Northern Arizona University is current editor of JMTP.

This is, indeed, a special day for the de Stwolinski Center. It was one of Gail de Stwolinski's fondest dreams to elevate the role of classroom music theory teacher--the person who devotes a career to this often unsung but vital role.

Pursuant to Gail's wishes, today we announce the fourth recipient of the Gail Boyd de Stwolinski Prize for Lifetime Achievement in Music Theory Teaching and Scholarship. The de Stwolinski Prize, in the amount of $10,000, is permanently endowed by Louis de Stwolinski, Gail's husband of 45 years. The prize is awarded biennially to an outstanding music theory pedagogue, someone who has devoted a lifetime to music theory instruction and scholarship.

The selection process involves nominations from leaders in the field of music theory pedagogy, and the winner is chosen by a revolving panel of distinguished music theory pedagogues who make a recommendation to the de Stwolinski Center Board of Directors.

The text of the award reads as follows:

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

Be it therefore resolved that at the annual meeting of the Society for Music Theory in Los Angeles CA in November 2006, the fourth Gail Boyd de Stwolinski Prize for Lifetime Achievement in Music Theory Teaching and Scholarship be awarded to

MARY WENNERSTROM

Honoring Her

Unique Mentoring of Graduate Students,

Seminal Contributions to Pedagogical Publications,

Excellence in Classroom Teaching,

and

Tireless Support of Professional Associations.

Mary Wennerstrom is Professor of Music and Associate Dean for Instruction at Indiana University. She served as Chair of the Department of Music Theory at IU for over twenty years where she managed the appointment of close to four hundred graduate teaching assistants and oversaw their rigorous training program. As director of a number of dissertations on theory teaching, she continues to be known and respected for her mentoring of the graduate students under her care, many of whom are now serving as theory instructors at colleges and universities throughout the United States. Graduate students who have worked under her supervision have spoken of her creativity, musicality, and sense of humor.

Professor Wennerstrom was the winner of Indiana University's President's Award for Outstanding Teaching in 1993, and she was awarded an Honorary Lifetime Member of the Society for Music Theory in 2002 for her role as founding treasurer. She was a leading faculty member at the first College Music Society Summer Institute on Music Theory Pedagogy in Boulder, Colorado, and has often presented papers at regional theory meetings.

Renowned as the editor of *Anthology of Musical Structure and Style* and *Anthology of 20th Century Music*, she has served the field of music theory pedagogy in numerous ways: as a member of the Graduate Record Examination and Advanced Placement Music Test development committees, as chair of the Society for Music Theory Professional Development Committee, as chair of the Editorial Review Board and subsequently editor of the *Journal of Music Theory Pedagogy*.

Her areas of special interest include music theory pedagogy, musical form, and nineteenth- and twentieth-century musical structure. As one of the designers of the Integrative Program for Indiana's undergraduates, she helped to invent this innovative curriculum that combined literature and theory in chronological order. This five-term sequence was both creative and ambitious in its scope. Graduate students received invaluable training teaching sections under the guidance of master teachers, and she published an important article describing this curriculum. According to one of her students, Professor Wennerstrom's . . . "efforts have helped to shape the musicianship of many of the best performers today, as well as a whole generation of grateful theorists." We are indebted to her student, Robert Hatten, for contributing to this narrative.

Previous winners of the Gail Boyd de Stwolinski Prize are John Buccheri, Northwestern University, Robert Gauldin, Eastman School of Music, and Dorothy Payne, University of South Carolina. The next winner will be announced in fall 2008.

Absolute Pitch Perception and the Pedagogy of Relative Pitch

Elizabeth West Marvin

While intuition suggests that aural skills pedagogy should be closely linked to findings in music-cognitive research, music theorists have only infrequently written about this relationship (Butler 1997, Butler and Lochstampfor 1993). Gary Karpinski's research is a notable exception (Karpinski 2007, 2000, 1990), as are occasional articles appearing in the *Journal of Music Theory Pedagogy* and elsewhere (Lake 1993, Larson 1993, Marvin 1995, Potter 1990). More recently, two experimental studies have empirically tested the effectiveness of various dictation and sight-singing strategies (Killam, Baczewski, and Hayslip 2003, Lorek and Pembrook 2002). Even so, researchers from other fields as disparate as developmental psychology, neurology, genetics, and cognitive science continue to investigate one aspect of musical cognition that both intrigues and inspires them to further research: the phenomenon of absolute pitch (AP). This essay draws upon that research to illuminate the abilities and challenges of AP musicians and to inform an effective aural skills pedagogy appropriate for both AP and non-AP listeners.

Absolute pitch is generally defined as "the ability to identify the frequency or musical name of a specific tone, or, conversely the ability to produce some designated frequency… or musical pitch without comparing the note with any objective reference tone." (Ward 1999, 265). Relative pitch, on the other hand, is characterized by the ability to identify relationships between musical tones (such as intervals or scale degrees), or to identify the name of a musical tone by its relation to a reference tone. One challenge in developing an effective aural skills pedagogy is the mixed population of AP and non-AP students in many music schools. AP students are usually too few in number to create a special course tailored to their needs, and too often the decision is simply to exempt these students from aural skills training based on a placement test. This solution may be ill-advised, however, because fluency in understanding musical structure requires the perception of *relationships* among pitches—in short, relative-pitch abilities. This relational understanding of

pitches within the context of a key is arguably more important than knowledge of which particular pitches or keys a musical passage expresses.

Those who have taught AP students in aural skills classes will recognize the student whose strategy for the relatively straightforward task of identifying intervals is to write down every pair of letter names, only to return later to analyze them for their intervallic size and quality. While this strategy is ultimately successful, as shown by typically high scores on standard dictation tests by AP students, it demonstrates a "work-around" strategy for these students rather than true interval perception. The challenge with AP listeners is to teach them how to focus on the relationships between pitches, rather than upon the pitches themselves. In his provocatively titled 1993 article, "Absolute Pitch as an Inability: Identification of Musical Intervals in a Tonal Context," researcher Ken'ichi Miyazaki speaks directly to the issue of pedagogy:

> Considering that pitch relationships in a tonal context are essential in music, the difficulty in recognizing pitch relations is indicative of a sort of musical handicap AP possessors may have. . . . They acquired AP through early musical training, but did not seem to develop relative pitch in its fullness. . . . Their AP has resulted in suppressing the development of relative pitch. This speculation provides an important suggestion for early musical instruction, that is, children who have begun musical lessons from an early age should be given training in relative pitch that is systematically and carefully designed. (Miyazaki 1993, p. 70)

While Miyazaki's words may seem strong, he raises important issues regarding AP acquisition and music teaching. In response, this paper suggests specific strategies for aural skills instruction for

AP students at the collegiate level.[1] Because the impetus for these strategies comes from research in music cognition, we begin with a broad overview experimental research on absolute pitch before turning to the pedagogy of relative pitch.[2]

Music-Cognitive Research Testing Absolute-Pitch Abilities

Melody recognition and dictation:

We begin with experiments that document AP possessors' performance on tasks designed to engage relative-pitch skills: melody recognition under transposition and interval identification. Baczewski and Killam (1992) asked five professional musicians (music performance faculty) with AP to notate a sixteen-measure Mozart duet for viola and violin in G Major, rather than in the B-flat major in which it was heard. Three participants flatly refused to do so and transcribed the tune in B-flat, with high rates of accuracy. The two participants who attempted to notate the tune as instructed, in G Major, had numerous errors—in fact, their performance was less accurate than the fifteen non-AP participants in a control group (20% correct for AP notating in G Major, 45% correct for non-AP). Because this experiment had too few participants for significance testing, the

[1] Of course there is no denying that AP can be helpful to musicians. To name just a few examples, AP assists musicians in hearing long-range tonal relationships over time, tuning and performing atonal music, providing pitches for *a cappella* choral music, hearing unfamiliar music inwardly (from score reading), and transcribing music from sound to paper. Nevertheless, the AP musician who never develops relative-pitch skills may miss an entire dimension of music listening and performance: the aural understanding of dynamic hierarchical relationships within a key. This musician may encounter problems as well, especially in learning to tune to other musicians when a conductor chooses to perform a work in a key other than that notated, when playing on Baroque organs or in early music ensembles, when singing with a choir that creeps flat or sharp, or when doing ethnomusicological research in other tuning systems.

[2] For all experimental studies cited from scientific journals, tests of statistical significance have been performed by the authors, using an alpha level of at least .05. In other words, results are shown to be attributable with 95% probability to the effect of the independent variable, and only 5% to the effect of chance. Participant groups in all experiments cited here are all sufficiently large to achieve this level of statistical significance (unless otherwise specified).

results cannot be generalized to the full population of AP listeners. Marvin (1997) tested a larger sample of AP participants in a melody discrimination experiment using transposed melodies. She found significantly lower accuracy rates for AP than non-AP musicians in one condition. Participants (49 freshmen and sophomore music majors, 10 AP music majors of comparable age, and 34 nonmusician undergraduate psychology students) were to listen to short tonal or atonal melodies, and then to respond "same" or "different" to a comparison tune that was either an exact transposition or a same-contour inexact transposition (one pitch changed). In the tonal melodies, the AP participants distinguished between exact and inexact transpositions better than non-AP listeners (mean "hit" rate of .88 for AP, .80 for non-AP), but this advantage virtually disappeared in the atonal melodies. In the atonal condition, the AP group's performance was not significantly better than the non-AP group, nor better than nonmusicians. (Hit rates were .58 AP, .56 non-AP, and .53 nonmusicians.) The study concluded that given an atonal melody, non-AP listeners may encode a succession of interval names, which remains invariant in the correctly transposed condition and changed only in the inexact transposition. In contrast, AP listeners may remember the sequence of pitch letter names, all of which change in both transposed conditions.[3] To discriminate between exact and inexact transpositions using this strategy, AP listeners would have to perform rapid mental transposition of the entire tune. Without the aid of a key context, this strategy would result in more errors than an intervallic strategy.

In a similar experiment, Miyazaki and Rakowski (2002) presented 26 solfège students (nine of whom had AP) with a seven-note tonal or atonal melody in music notation. Each melody began on C. While viewing the music notation, listeners heard an exact or inexact (one changed note) performance of the melody beginning on C

[3] Miyazaki (2004) suggests, "Listeners with AP can't suppress pitch labeling even when it brings disadvantages." In an experiment with 44 undergraduates enrolled in an introductory psychology course, participants were asked to remember a visually presented sequence of nine random pitch syllables or digits (1-7) while ignoring irrelevant sounds (piano tones, spoken pitch syllables, spoken digits, or no sound). His 22 AP listeners showed greater interference for the piano tones than non-AP, suggesting that AP listeners named these tones even when told to ignore them, and that the naming function interfered with memory for the visually presented sequence.

or transposed to begin on F♯ or G♯. Participants were to determine whether the notation and sounding melody were the same or different (according to principles of relative pitch—that is, allowing for the transposition). In both the tonal and atonal conditions, AP listeners were significantly more accurate than non-AP if the sounding melody began on C and thus matched the notation. However, if the sounding melody was transposed, the non-AP musicians were more accurate than AP in both the tonal and atonal conditions, suggesting that the two groups used different cognitive strategies to complete the task. All three experiments suggest that some AP musicians, when confronted with a task that requires relative-pitch skills, may persist in trying to use AP to complete the task and are unable to switch to a relative-pitch strategy.

Interval and pitch naming:

Miyazaki (1992, 1993) and Benguerel and Westdal (1991) tested AP possessors' ability to identify intervals—a "classic" relative-pitch task—in out-of-tune contexts. In Miyazaki's 1993 experiment, 55 participants (40 AP or "partial AP" and 15 non-AP) were asked to identify various intervals in one of three possible tonal contexts established by a cadential pattern in C Major, F♯ Major, or a quarter-step-flat E Major. After hearing the chordal context, participants were asked to imagine the first note of the following interval as *do* in the key just presented, and to identify the interval by the solfège syllable of the second pitch.[4] Miyazaki then presented his stimuli in "in-tune" and "out-of-tune" conditions, with intervals slightly wide or narrow. When scoring, he used a plus-or-minus 40 cents range for

[4] This response mode is a possible confounding element in Miyazaki's experimental design: participants were asked to name intervals using moveable-do solfège syllables. (For example, for a major third, participants were asked to respond *mi*; for a perfect fourth, they were to respond *fa*, and so on.) This is an unusual method for identifying intervals, not commonly used in music training. Further, if these students were previously trained using a fixed-do pedagogy—or indeed, simply named pitches using fixed-do solfège syllables—then the experimenter's request to respond with moveable-do syllables may have been confusing. Their significantly higher accuracy in the C Major context (over the F-sharp major and flattened E-major) could be attributed to the equivalence of fixed- and moveable-do syllables in the key of C. The author acknowledges this possible confound in his discussion of the experiment in Miyazaki and Rakowski (2002).

each interval: in other words, he scored the response "mi" (a major third, or 400 cents) as correct if the interval presented to the listener spanned anywhere from 360 to 440 cents. Miyazaki's AP possessors showed considerable variability in their performance, and scored significantly lower in the F♯ major and out-of-tune E Major contexts than in the C Major context. The non-AP group maintained a consistent level of performance across all key contexts.

AP possessors' decreased accuracy in the F♯ major and flattened E major conditions may have been affected by two factors: first, the mistunings may have interfered with participants' labeling abilities; and second, these two keys feature predominantly black-key pitches. The black-key hypothesis is based on a finding that has been replicated by a number of researchers (Miyazaki 1989, 1990, Takeuchi and Hulse 1991, Marvin and Brinkman 2000): that AP listeners identify white-key pitches more quickly and more accurately than black-key pitches. Miyazaki (1989) presented seven AP music majors and 18 non-AP psychology students (with varying degrees of music training) with pitches to identify in three timbres: piano tones, complex tones, and pure tones. Participants responded by touching a piano key to identify its pitch name. He reported a significant white-key/black-key difference among AP participants for response time (1.575 secs for white and 1.662 secs for black notes). Accuracy rates were also higher for white-key notes than black-key across all three timbres. Miyazaki reported a timbre effect across white- and black-key responses: 91.6% correct for piano tones, 80.4% correct for complex tones, and 74.4% correct for pure tones.

Takeuchi and Hulse (1991) questioned Miyazaki's experimental design, reasoning that the keyboard interface had caused longer response times for black-key pitches. Their replication asked 19 AP and 6 non-AP participants to respond "same" or "different" to a pitch name flashed on a computer screen each time participants heard a pitch played (non-AP participants were given a reference tone). Even after changing the experiment's design, these researchers found similar effects. Both AP and non-AP participants were more accurate for white-key pitches: AP, 75% black and 90% white; non-AP, 79% black and 88% white. AP participants responded significantly slower for black-key pitches (1310 msec for white and 1650 msec for black), but no response-time difference was found for non-AP listeners.

Timbre effect:

Another aspect of AP perception that has received attention by experimenters is the effect of timbre on pitch identification. Several researchers have found that AP listeners more easily identify tones with rich harmonic spectra than pure tones. As mentioned previously, Miyazaki (1989) found that AP participants' accuracy identifying complex tones fell between the extremes for piano and pure tones; thus it may not be solely a richer harmonic spectrum that assists AP listeners, but also familiarity with the timbre. Indeed, his subjects were all pianists who had begun their piano study as young as three to five years of age.

Marvin and Brinkman (2000) tested for both a timbre effect and familiarity effect by soliciting roughly half of their 20 AP participants from undergraduate keyboard majors and the other half from string majors. Their stimuli were half keyboard and half string timbre: isolated tones in their first experiment, and musical excerpts from piano or string quartet pieces in two additional experiments. Their response-time data for isolated-tone recognition showed a significant effect of timbre, with piano tones identified more quickly (1.99 secs) than string tones (2.3 secs) by both the string and keyboard performers. (This result may be an artifact of collegiate ear training, which typically takes place using the piano timbre.) Where listeners were asked to identify the key of musical excerpts, no significant timbre effect was found. There was an effect of participants' instrument, however: piano performers identified the key significantly faster than other participants, whether the stimulus was in keyboard or string timbre. The authors hypothesize that pianists' experience performing homophonic textures, rather than solo lines, assisted them in determining a tonal center more quickly.

Music-Cognitive Research Informing Theories of AP Acquisition

Early-learning hypothesis:

Experimental findings have led some authors to speculate upon theories of AP acquisition. Most prominent among these theories is the early-learning theory of AP acquisition: that absolute pitch may be acquired only during a "critical period" in childhood, much like the critical period that has been demonstrated for language

acquisition.[5] During the critical period—perhaps between the ages of four and six—researchers hypothesize that children have the potential to acquire AP if note names and pitch sounds are explicitly associated, for example in the context of early-childhood instrumental music lessons. This hypothesis has the potential to account for the white-key/black-key effect discussed above.[6] According to this theory, since children in the early stages of piano study typically play pieces using simple five-finger patterns on the white keys, they acquire AP for white keys only. These students move on to repertoire with more black notes only after the critical period has ended; thus their black-key identifications are unconsciously made by half-step displacement from the more familiar white notes, a process that takes slightly longer. A similar case might be made for the open strings of the violin—all "white-key" pitches, as it were.[7] Numerous researchers have demonstrated a relation between AP possession and early musical training by asking participants to report the year in which they began music

[5] See Trainor (2005) for an overview of critical-period research pertaining to absolute pitch acquisition and more generally to the development of the auditory cortex of the brain.

[6] Another hypothesis to explain the key-color effect, posited by Takeuchi and Hulse (1991), is that AP listeners' differences in speed and accuracy may be associated with the frequencies with which black- and white-key pitches occur generally in music literature. Simpson and Huron (1994) support this hypothesis by appealing to the Hick-Hyman law, which relates the reaction time for a given stimulus to its expected frequency of occurrence. Simpson and Huron analyzed a computer-based sample of Western music for frequencies of pitch occurrence and found the results to be consistent with the faster reaction times for white-key pitches. Under this hypothesis, reaction times for all subjects—AP and non-AP—ought to be quicker for white-note identification. This is, in fact, the finding of Marvin and Brinkman (2000), who report key color differences in both speed and accuracy for non-AP musicians, as well as AP.

[7] It should be noted that experimental work on AP is clearly biased toward Western musicians, instruments, tunings, and musical systems. (The white-key/black-key distinction is but one example.) Generalizations to be drawn from this work are therefore only valid for populations familiar with Western tonal music; little is currently known about AP in non-Western musical cultures. Even though a substantial number of experimental studies draw their participants from Asian populations, these participants are without exception Asians trained in Western tonal music (often music conservatory students).

lessons (Deutsch *et al.* 2005, Gregersen *et al.* 2000, 1999, Marvin and Brinkman 2000, Miyazaki 1988). Takeuchi and Hulse (1993) point out that the critical period hypothesis is consistent with a general developmental shift in children from perceiving individual features in early childhood to perceiving relationships among features at an older age.

Levitin and Rogers (2005) believe that acquisition of AP occurs when children are explicitly taught pitch labels as their vocabularies are developing. The process could be viewed as analogous to children learning and practicing the labels for colors: most children are explicitly taught the labels for colors, but most are not taught labels for pitches during this critical period. Russo *et al.* (2003) have provided some experimental evidence for the early-learning hypothesis by explicitly training children and adults to recognize one "special note." Eight children and eight adults were trained over a six-week period to raise a flag when they heard the special note (C5). Although there was no significant difference in pitch-recognition abilities between the children and adults at the beginning of the training period, a clear critical-period effect emerged during training. By the end of the six weeks, children ages three to four years old scored between 30-60% correct, children ages five to six scored 80-100% correct, and adults scored from 10-100% correct (with wide variability in performance). These data suggest that the critical period occurs at around age five to six, but AP is acquired only if children are explicitly taught to associate labels with pitches.[8]

[8] While the critical-period theory argues against adult acquisition of AP, some notable attempts have been made to train adult listeners in absolute pitch. Rush and Butler (1995), for example, found significant improvement in pitch recognition for their experimental group as compared with a control group. This improvement was directly related to advancement in the David L. Burge training method. This method associates a particular "affect" with each pitch class: for example, F♯ is perceived as sharp and biting, while E♭ is mellower. Even so, the post-test scores of the experimental group were substantially lower than one would expect for "true" AP possessors, as the authors themselves note. Rush and Butler's best-scoring subgroup scored means of only 50% correct on the post-test. Faivre's (1986) experiment reported much higher scores than Rush and Butler's on her AP post-test; however, she had only three subjects in this high-scoring group—too small a subject group to generalize to a larger population. Because musicians with true AP tend to identify pitches quickly and without much mental effort, a comparison

Unlearning hypothesis:

In contrast to the early-learning hypothesis, Jenny Saffran and collaborators (Saffran and Griepentrog 2001, Saffran 2003, Saffran *et al.* 2005) have explored the question of whether all children are born with AP abilities. They hypothesize a developmental shift from absolute- to relative-pitch processing, which some researchers refer to as the "unlearning" theory of AP acquisition (Levitin and Rogers 2005, Ward 1999) or the "maturational switch" (Trainor 2005). In experiments with eight-month-old infants, Saffran demonstrated that babies use an absolute-pitch strategy to recognize three-note melodies. Saffran's stimuli were constructed according to a statistical-learning model adapted from artificial language-learning experiments. In the language experiments, listeners were exposed to a continuous series of nonsense syllables and learned to segment the incoming stream of syllables into words by tracking the statistical probabilities with which syllables recurred as adjacencies (Saffran *et al.* 1999). At the end of an exposure phase, babies and adults were able to distinguish words from non-words in the artificial language.

In one music adaptation of this design (Saffran and Griepentrog, 2001), a group of 20 eight-month-old babies heard a three-minute continuous recording of 45 randomly ordered instances of four "tone words": for example, G♯ A♯ F, C C♯ D♯, B F♯ G, and A D E. After familiarization with the tone stream, babies heard repetitions either of tone words or part words (that crossed a word boundaries, such as F C C♯). All part words were transpositions of tone words (F C C♯ is a transposition of B F♯ G). Thus if babies responded differently to tone words vs. part words, this difference could be attributed to their recognition of the tone word *at pitch*—in other words, by using AP not non-AP. This was, in fact, the result: infants listened significantly longer to repetitions of part words than words. Saffran has run a series of parallel experiments on adults in tonal (diatonic)

([8] *continued*) of reaction times for the training group vs. a true-AP group would have been a valuable measure of the success of either training program, as would a follow-up test some months later to assess the stability of participants' AP abilities over time.

and atonal (chromatic) conditions as well. She concluded that:

> There is a developmental shift in pitch processing between infancy and adulthood . . . This shift during development — from generally prioritizing absolute pitch patterns to generally prioritizing relative pitch patterns . . . is advantageous to the listener; while absolute pitches are certainly available in the auditory environment, they provide a poor basis for generalization from prior listening experiences for both music and speech. (Saffran 2003, p. 41)

In a later study, and in response to other experimental work (Trehub 2003) showing non-AP abilities in babies, Saffran (2005) found that babies can also use relative pitch, but that the nature of the task itself influences which strategy babies use.[9]

[9] There are parallels here to research on AP perception in animals. Some early research argued that starlings (among several species of birds) recognize songs only at absolute-pitch levels. The argument held that AP is the simpler cognitive strategy, since it does not require higher-level relational processing. However, more recent studies (e.g., MacDougall-Schackleton and Hulse, 1996) have shown that birds are capable of both types of processing, depending upon the nature of the task given. Even so, it appears that birds initially respond to testing using an AP strategy, and only if it fails do they switch to an non-AP strategy.

Wright *et al.* (2000) also found evidence of an AP strategy in rhesus monkeys, who recognized simple tonal melodies (such as "Happy Birthday to You") in transposition by one or two octaves, but not by .5 or 1.5 octaves (that is, transposition by a tritone, an non-AP task). In this case, no non-AP abilities were found, though more research remains to be done that varies the design of the task. Interestingly, the octave generalization found in monkeys for tonal melodies was not replicated in an isolated-tone condition nor in an atonal-melody condition; it appears that a well-formed tonal melody was necessary for the octave generalization to take place.

Genetic and tone-language hypotheses:

The unlearning hypothesis fails to explain why some children retain absolute-pitch abilities into adulthood while others do not. The early-learning hypothesis fails to account for the fact that many children enrolled in early music lessons do not acquire AP (Baharloo *et al.* 1998; Gregersen *et al.* 2000, Saah and Marvin, 2004). Some researchers hypothesize that there must be a genetic marker associated with absolute pitch. Two teams of researchers are actively exploring the genetics of AP (see Baharloo *et al.* 1998, 2000 and Gregersen *et al.* 1999, 2000).[10] Gregersen *et al.* (2000) report on a survey of 1067 music students enrolled in music theory classes at thirteen different colleges and conservatories in North America. Students were asked about musical training and whether they or family members had AP (but no direct AP test was administered). The data suggested a genetic component at work: of the AP music students surveyed, almost 16% had siblings with AP; whereas only 1% of non-AP students had an AP sibling.

Among the findings of these researchers is a higher concentration of AP in Asian musicians than non-Asian.

> The overall rate of AP in this population was 12.2%. . . . There was a markedly increased rate of AP among Asian students (42/80; 47.5%) compared with Caucasian students (75/834; 9.0%). The relatively higher rate in Asians was present among all major ethnic subgroups—Japanese (26%), Korean (37%) and Chinese (65%). (Gregersen 2000, p. 280)

One might hypothesize that the higher instances of AP among Asians is due to a higher proportion giving their children early music instruction, but there was no significant difference in this sample: 80% of Asians and 71% of Caucasians reported early music instruction. What may differ is the type of early music instruction and, perhaps, the cultural value placed upon absolute pitch possession. For example, a much higher proportion of Asian participants reported fixed-do solfège training, which explicitly

[10] Jane Gitschier, one of the co-authors of the Baharloo *et al.* study, maintains a website for recruiting AP participants for genetic testing (http://perfectpitch.ucsf.edu/ppstudy.html). The site summarizes the research of this group, provides article downloads, and includes an online test of AP.

teaches AP through the association of pitches with sung syllables, before the age of seven.[11] Anecdotal stories from students trained in Asia report explicit training of children in pitch recognition and naming, and tests of AP used as one criterion for continuing musical training.

Deutsch *et al.* (2004, 2006) proposed another possible explanation for the higher incidence of AP among Asian music students, hypothesizing that absolute pitch evolved as a feature of speech. Mandarin, Cantonese, and Vietnamese are tone languages; Japanese and Korean are pitch accent languages. In all of these languages, a change in a word's spoken pitch completely transforms its meaning. Because Asian children are exposed, during a critical period in infancy, to a language in which the tones of speech carry lexical meaning, they learn to distinguish between tones. Later they acquire absolute pitch for music in the same way that children learn features of a second tone language.

Deutsch *et al.* (2006) were the first to administer a direct test of AP to comparable populations of musicians in the U.S. and China (all incoming undergraduates at one major music school in each country). All 88 Chinese participants spoke Mandarin; the 115 U.S. participants were non-Asian students who did not speak a tone language. The incidence of absolute pitch in the Chinese group was significantly higher than the U.S. group. Further, the data showed a clear effect of age of onset of music training, in support of the critical-period hypothesis. In both groups, the highest probability of AP was associated with students who began music training at age 4-5, the second highest with those who began at age 6-7, and the lowest probability with those who began at age 8-9.

Two-component hypothesis:

Daniel Levitin (1994) has hypothesized that long-term pitch memory, one component of AP, is more widespread in the general population than previously thought. According to his

[11] With regard to sibling data and early-music instruction: of AP music students whose siblings had fixed-do training before age 7, almost 23% of those siblings also have AP; whereas only 1% of non-AP students' siblings acquired AP even if trained on fixed-do before age 7. In siblings of AP students who had no music training of any type before age 7, 14% of them nevertheless acquired absolute pitch. Thus it appears that a combination of nature and nurture is at work in shaping AP listeners.

two-component theory of absolute pitch, many listeners (even nonmusicians) possess this first component of AP—pitch memory—but only "true" AP listeners possess the second component: pitch labeling.[12] Levitin tested this hypothesis experimentally by asking 46 undergraduate psychology students, unselected for musical ability, to select two CDs of popular music from shelf of recordings in a sound-proof room. They were to hold each CD, choose a familiar song, try to hear it in their heads, and then sing as much of it as they wished. On the first trial, roughly a quarter of the participants began the song on the correct pitch, and a little over half of them sang within a semitone of the correct pitch. Levitin concludes that "for at least some well-known popular songs, a larger percentage of people than previously recognized possess absolute memory for musical pitch." (p. 421)[13]

[12] The pitch labeling aspect of AP accounts for some findings obtained in brain imaging experiments on AP participants. An extremely simplified explanation of hemispheric specialization in the brain would ascribe language processing to the left hemisphere and musical processing (pitch, melody, contour) to the right hemisphere. Yet in two publications from 2003, Robert Zatorre shows that AP musicians, and not non-AP, activate the left side (the left posterior dorsolateral frontal cortex) when listening to tones. One possible explanation for this left activation is the assignment of labels (a left-hemisphere language function) to pitches as they are heard. Support for this claim comes from the fact that when asked to label pairs of pitches with interval names, both AP and non-AP musicians activate this area. Non-AP musicians also activate the right frontal area of the brain that is responsible for working memory, presumably because they need to keep updating the memory trace of the pitches in order to compare and name the interval. AP musicians, because they can instead use a label to remember the pitches, do not need to use working memory in the same way and do not activate the right side. Schaug (2001), Zatorre, and others also report a brain size asymmetry in AP musicians, with a larger leftward asymmetry in the planum temporale. Such an asymmetry, if present at birth, suggests a genetic factor at work; infants born with this asymmetry may be more likely to acquire AP if given training at the right time.

[13] Related experiments explore pitch memory for melodies, such as folk songs or lullabies that are learned by rote without a canonical "correct" key and pitch level. For example, Andrea Halpern (1989) asked adults to sing folk tunes and holiday songs from Western popular culture (such as "Happy Birthday to You") on two different occasions without giving them a starting pitch. She found very low variability between participants' two starting pitches from the first to second performance, suggesting that they had a stable mental representation that retained the tunes at an absolute pitch level. Bergeson and Trehub (2002) tested mothers' speech and singing to their infants, comparing tempo and pitch measurements taken on two different days a week apart. They found high variability between

In a similar study that tested 48 college students' (unselected for musical training) memory for the pitch of television theme songs such as *Friends*, *Jeopardy*, *Law & Order*, Schellenberg and Trehub (2003) found that participants were able to distinguish between the original key and one-semitone shifts 58% of the time, and between the original and two-semitone shifts 70% of the time. Significant to the design of this study was the fact that participants were required neither to provide a pitch letter name nor sing. Rather, participants merely chose between two recordings the one they believed was heard at the "usual" pitch. By removing the requirements of pitch naming and vocal production, and by providing a rich musical context (familiar pieces rather than isolated tones), Schellenberg and Trehub demonstrated high levels of pitch memory in a group of participants unselected for musical ability. The authors conclude that:

> . . . [C]ontrary to scholarly wisdom, adults with little musical background retain fine-grained information about pitch level over extended periods. This finding advances the case that music listeners construct precise memory representations of music that include absolute as well as relational features. . . . It also demystifies aspects of AP such as its rarity, its bimodal distribution, and the reported critical period for AP acquisition. Once pitch-naming or reproduction requirements are eliminated and familiar materials are used, memory for specific pitch levels seems to be widespread and normally distributed. (p. 265)

([13] *continued*) the spoken utterances on the two days, but in contrast, the pitch and tempo of the songs was virtually unchanged from the first to the second day. Halpern's and Bergeson and Trehub's results are consistent with Levitin's in that they show some type of pitch memory to be a widespread phenomenon among adults who are not selected for musical ability.

All three of these experiments share a design based upon production: measurement of pitch by vocal production. Thus it is possible that they are confounded somewhat by the effect of by vocal tessitura—that is, men and women may have a preferred tessitura for singing popular tunes or folk melodies, and they may choose beginning pitches for vocal comfort, rather than from pitch memory. Or they may use "muscle memory" in their larynxes, rather than pitch memory in their minds, to reproduce songs in a consistent key.

Like Levitin, these authors demonstrate that once the labeling function is removed and meaningful musical contexts rather than isolated pitches are tested, then absolute pitch—more broadly defined as pitch memory—maybe be seen as a more widespread attribute than previously thought, one that is acquired by many people in the absence of specific training.

The Pedagogy of Relative-Pitch Perception

What does this research on AP perception tell us that can assist in the development of an effective relative-pitch pedagogy? First and foremost, we know that as AP musicians listen to music, they identify pitch names almost effortlessly and automatically. To AP students this naming strategy comes to them unbidden, just as color names come to us when we survey a landscape. To teach them to hear music in a different, relational way requires powerful tools—tools that will not "fight against" their AP abilities but will complement them. We need to communicate to all students that their primary objective in aural skills training is to learn to perceive musical function, and while class activities may include singing at sight or taking dictation, these skills are not the primary objective. This broader objective will inform many pedagogical decisions: in particular, the question of "fixed" versus "moveable" syllable systems, the development of class activities that reinforce functional understanding, and the role and timing of notation-based activities. Second, research tells us that for AP listeners, not all keys, registers, or timbres are equal when the task is pitch labeling. An effective pedagogy will use transposition strategically—including especially keys with black-note tonics—to teach musical function within a transpositionally equivalent tonal system. Likewise, it will find ways to augment dictation from the piano with other timbres and including many registers. Third, experiments show that musical contexts (as opposed to isolated tones or even isolated intervals) provide powerful cognitive cues, even providing non-AP listeners with strong pitch memories that are associated with particular pieces of music. Musical contexts are important for AP listeners, too, because they provide a wealth of functional relationships to be discerned. Finally, because we are focusing on a pedagogy of relative pitch—our objective for all students—the approaches discussed here are appropriate for both AP and non-AP students who may be taught together in a single classroom with the same materials and method.

Modeling Relative Pitch through Syllable Systems

We turn now from general pedagogical points to more concrete ones, beginning with the perennial fixed- versus moveable-do question.[14] Students with AP, particularly international students with AP, often come to the classroom with strong fixed-do experience. For many international students, the fixed-do syllable *is* the note name. Singing note names reinforces an absolute-pitch strategy for sight singing and dictation. It teaches nothing about relative pitch, our objective. Should we then convert all our fixed-do AP students to moveable-do, in order to model scale-degree functional relationships? While this might seem the easy solution, it simply doesn't work very well in practice. Although it is possible, it is very difficult for AP students with a fixed-do background to associate deeply ingrained solfège syllables with a new relational system—one that changes its pitch associations with each and every new key encountered. Further, AP students may resent being retrained in a syllable system they have already mastered. An effective solution is to sing instead on scale-degree numbers. Scale-degree numbers have most of the relative-pitch benefits of moveable-do solfège without the burden of forcing AP students to readjust to new syllable associations.[15]

[14] It is beyond the scope of this essay to recount the pros and cons of the various solfège systems in use in the United States today. Suffice it to say that fixed-do and moveable-do systems both teach valuable musical concepts—but they teach *different* concepts: the first teaches pitch recognition and the second teaches functional relations within a key. The choice of a solfège system is therefore intimately tied to course objectives. For an overview of the on-going debate about the two systems, see Lorek and Pembrook (2002), Michael Rogers's review-essay in the same publication, and the cited articles in both essays.

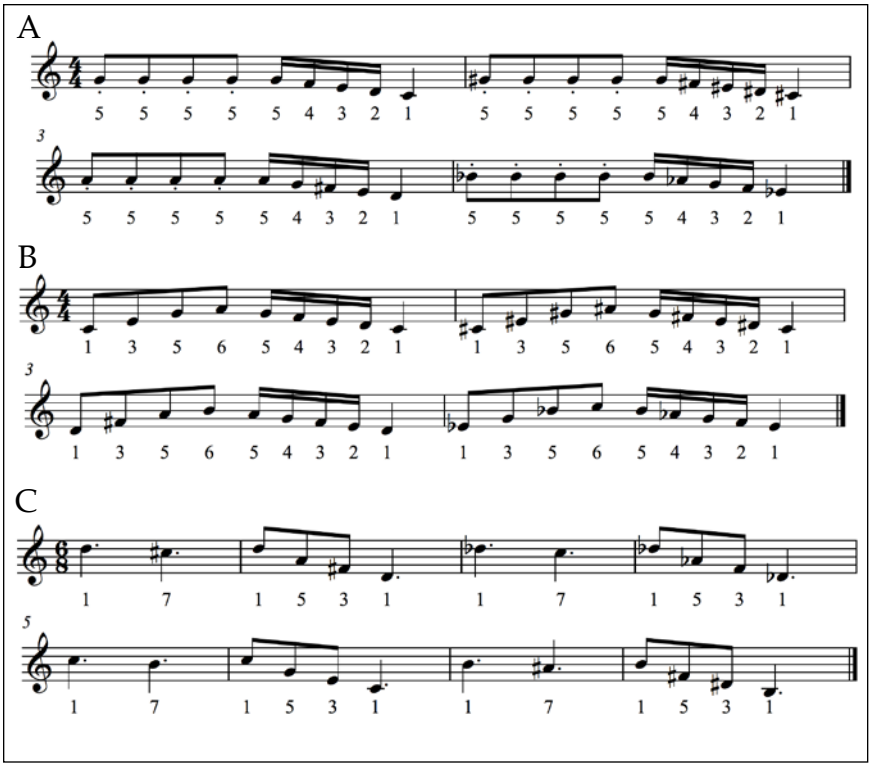
[15] There are a few disadvantages to scale-degree singing in relation to moveable-do solfège. First, the English words for scale degrees 1-7 are less musical to sing than the corresponding solfège syllables. Nevertheless, scale-degree numbers accurately model the functional system AP students need to learn, and they are easy to implement since rising numbers model rising pitch, and since scale-degree terminology is usually familiar to students from their theory classes. To avoid the two-syllable problem with "seven," many teachers simply use "sev." A second disadvantage arises over the problem of "inflecting" numbers to model altered scale degrees: for example, raising the fourth scale degree from *fa* to *fi* to tonicize V, or lowering the third scale degree from *mi* to *me* to sing in minor keys. Various solutions are possible, from working

A second relative-pitch technique that will benefit all students is to avoid pitch notation altogether for an extended period of time. Notation may be abandoned in favor of interactive activities such as call-and-response singing or dictation in scale-degrees, without benefit of a staff or announced key. The technique of teaching by interaction with sounding music, without music notation, has a long history. Sometimes dubbed "sound before sight," its advocates include well-known pedagogical writers of the past, like Zoltan Kodaly, and more recent ones like Edwin E. Gordon (2003). How do you structure an aural skills curriculum that avoids music notation? You design interactive musical tasks where students sing, read, and write using solely scale-degree representations. One way to begin this process is by vocalizing the students at the beginning of each class, singing scale segments and arpeggios on numbers while progressively changing key up or down by half step to warm up and extend the singing range of the voice. In practice, as patterns are transposed, the instructor would model the new tonal level by a vocal or keyboard cue (in the manner of a choral warm-up). The acts of associating numbers with these pitch patterns, and of continuously transposing the patterns, help AP students begin to make relative-pitch associations. Because patterns are learned by rote, no notation is involved. Example 1 (see next page) shows some possible patterns for vocalization.

We can extend the "sound before sight" concept beyond the vocal warm-up, by incorporating call-and-response activities into each aural skills class. In these activities, the instructor sings a tonal pattern, then the class or an individual echoes it back. As students' skills increase, new challenges may be added to the patterns. At the earliest stages, the instructor sings simple patterns that arpeggiate tonic and dominant triads on a neutral syllable (see Example 2 from Grunow *et al*. 1998 for sample patterns). Students echo back on the same neutral syllable, until they feel comfortable with the call-and-response format and are singing consistently in tune. In the second stage, instructors sing on scale degree numbers and ask students to

([15] *continued*) out a system of inflected numbers, to using a simple one-syllable word that shows the direction of the inflection (like "raise" and "low," or "sharp" and "flat"), to abandoning inflection altogether and simply making the necessary pitch alteration with the voice. For a class without fixed-do AP students, these two disadvantages may be reason enough to chose moveable-do solfège over numeric singing to teach scale-degree relations.

echo back on numbers. This gives students the immediate verbal association of scale degree numbers with the functional role of pitches within a key.[16] The alternation of one or two patterns based



Example 1: Vocalization on Scale-Degree Numbers

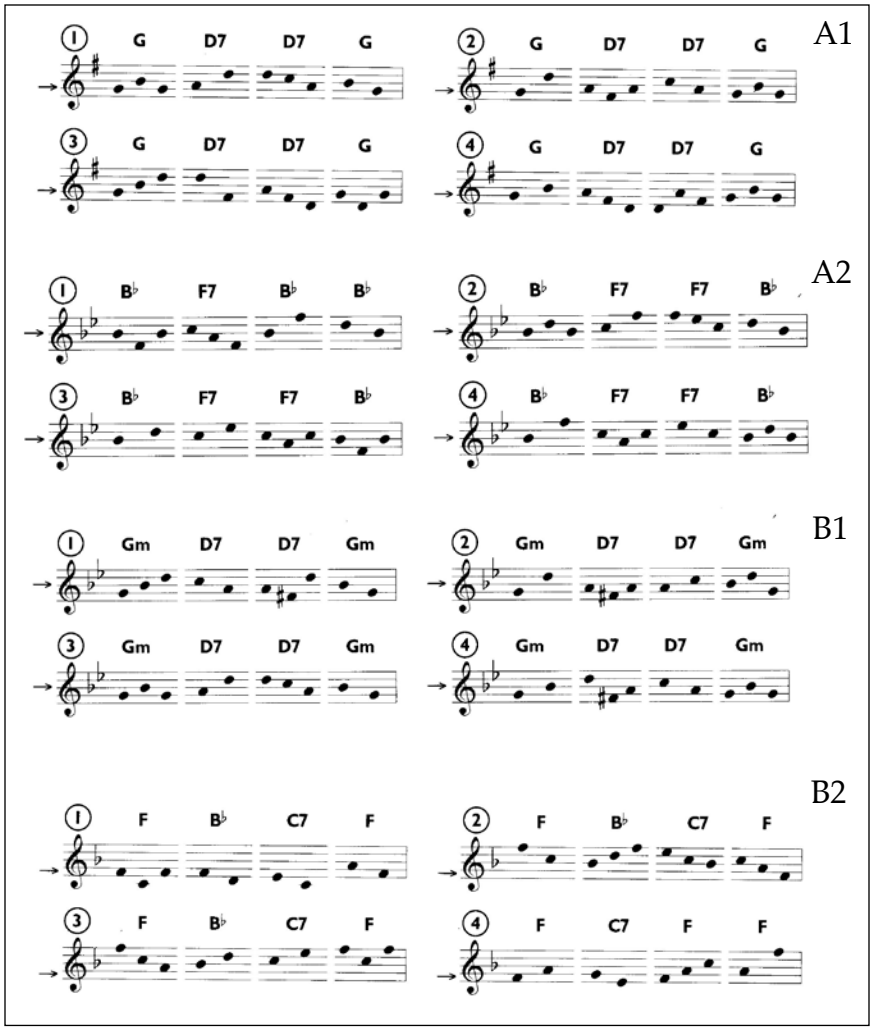
[16] "Verbal Association" is one of the terms associated with Edwin E. Gordon's music learning sequence (Gordon 2003, see Chapter 5 "Skill Learning Sequence"). For a succinct overview of Gordon's music learning theories, see Walters (1989). Gordon's work is sometimes criticized for its use of idiosyncratic terminology; nevertheless, aspects of Gordon's music learning theory may be successfully adapted to the collegiate classroom. In particular, Gordon advocates a call-and-response classroom activity with tonal and rhythm patterns that is carried out in several distinct stages in his skill learning sequence. In the first stage ("aural/oral"), students echo the teacher's sung patterns on a neutral syllable until mastery is achieved. In the second stage ("verbal association"), patterns are linked with meaningful syllables; for tonal patterns, Gordon uses moveable-do solfège with la-based minor. Patterns are also used as the basis for improvisation exercises. Only in the fourth stage ("symbolic association") is any music notation introduced. The pedagogy described here for collegiate students is consonant in many ways with Gordon's method, but it differs with

on tonic arpeggiations with one or two patterns based on the dominant or dominant-seventh harmonies helps instill a sense of harmonic progression in the sung exercises. Students attend better if the patterns are unpredictable in length, varying from two to three pitches in the early stages as Example 2 shows (see next page). Because of the variable rhythm, instructors may wish to guide the timing of responses with hand gestures, which may also be used to single out individuals for singing alone. The objective is that students echo the instructor accurately, and with good intonation, in group and solo singing in each stage before moving to the next one.

In the third stage of the call-and-response activity, the instructor sings the now-familiar tonal patterns on a neutral syllable and the students respond by singing back on scale degree numbers. For AP students, this ensures—in real time—that they are able to interpret a musical stimulus functionally within a key context. The pedagogical progression through a set of increasingly familiar tonal patterns from (1) neutral call and response, to (2) scale-degree call and response, and finally to (3) a neutral call answered by a numeric response, helps most students attain a high degree of fluency. The real-time challenge of answering the instructor immediately with sung patterns converted to scale degree numbers, and the possibility of being randomly chosen at any moment to sing a solo response, keeps the activity engaging even for AP students and those who may find the beginning levels easy. By calling for solo responses, instructors will soon discover which students respond well to more challenging patterns, and which students need to experience success with easier patterns, and so can tailor the activity to individual differences and abilities. As the aural skills curriculum progresses from semester to semester, the call-and-response activities can be increased in difficulty by asking students to improvise their own patterns according to specific guidelines,[17] by singing in minor keys, adding stepwise filling in of triads, adding length to the patterns, and adding new harmonies as they are studied. Of these, improvisation is a particularly powerful activity for AP students, since it requires functional thinking (e.g. "Sing a five-note dominant pattern then resolve it to a three-note tonic pattern").

([16] *continued*) respect to the amount of time students spend at each stage, in the sequence of tonal patterns used, and in its use of do-based rather than Gordon's la-based minor.

[17] For examples of improvisation exercises using tonal patterns, see Azzara *et al.* (2006, 1997).



Example 2: Tonal Patterns for Call-and-Response Singing

How might call-and-response activities be tailored especially to the needs of AP students? First, change keys periodically during the activity, choosing especially keys with black-note tonics (unlike those in Example 2). Establish each new key with a short progression at the piano, then begin tonal echoes again in the new key—never announcing the name of the key, or paying any attention to letter name identification at all. Give AP students (indeed, all students) opportunities to sing in "difficult" keys like C♯ Major. For non-AP students, this won't matter; for AP students, opportunities to work

with black-note tonics are important. Second, vary the timbre used for the calls. Instructors who play an instrument other than piano might occasionally play the calls on that instrument. Students who are performing well on the sung responses can be called upon to lead the group by playing the calls on their instrument. Very capable students can be asked to improvise the calls along guidelines given, or the instructor can write out a sequence of patterns for student leaders to use.

Singing at Sight

Although AP students will become accustomed to rapid-fire translation of pitches into scale degrees from call-and-response activities, they will nevertheless naturally return to pitch-processing rather than relationship-processing if given traditional pitch-reading tasks like singing melodies from music notation. One way to counter this tendency is to ask students to sing from scale degree numbers alone. A textbook that takes this approach—teaching sight singing from scale-degree representations in each chapter before introducing staff notation—is Yasui and Trubitt's, *Basic Sight Singing*.

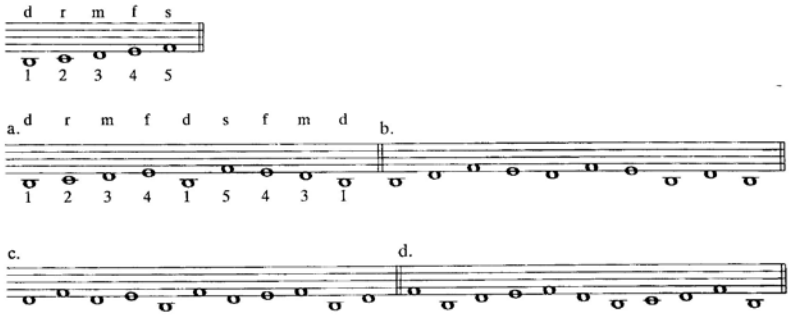
Example 3 illustrates Yasui and Trubitt's typical unit of study, incorporating steps and skips within scale-degrees Î through 5̂. The authors begin with numbers alone (or alternatively movable-do solfège), and then move to pitches written on a staff that has no clef, and finally to traditional staff notation. The use of the clef-less staff allows students to begin making an association with lines and spaces in a relative sense, but not with particular pitches—in a relative notational system, not an absolute one. The instructor may establish various possible tonic keys at the piano, then ask students to sing from this notation. Instructors of AP students may create progressively more difficult melodies, while avoiding traditional staff notation, in several ways. Scale-degree numbers may be written above or below traditional rhythmic notation, replacing the Yasui and Trubitt arhythmic format. Or instructors can use staff notation, but excise the clefs and key signatures from tunes originally notated in various clefs (including C-clefs), asking students to sing on scale degrees in major or natural minor from a variety of possible tonics. Singing on scale-degree numbers from this notation helps AP students get used to reading scalar and triadic patterns in relation to a tonic that may appear in different positions on the staff, but without associating any letter names with these pitches.

Level 6 Exercises: scale degrees 1 2 3 4 5 / d r m f s (steps and skips)

	Scale Degree Number	Solfège
a.	1 2 3 5 4 1 3 2 3 4 1 2 5	d r m s f d m r m f d r s
b.	3 5 4 1 2 3 1 5 3 1 5 4 3	m s f d r m d s m d s f m
c.	2 3 2 1 2 5 4 3 4 1 3 2 5	r m r d r s f m f d m r s
d.	1 5 3 4 1 5 4 1 3 2 5 1 2	d s m f d s f d m r s d r
e.	5 1 3 2 5 4 1 3 4 1 2 5 3	s d m r s f d m f d r s m
f.	3 1 5 4 3 1 2 5 3 4 1 3 2	m d s f m d r s m f d m r
g.	3 2 5 4 3 1 2 5 3 4 1 2 5	m r s f m d r s m f d r s
h.	3 1 2 5 4 1 3 2 1 3 4 1 5	m d r s f d m r d m f d s
i.	1 5 3 4 1 3 2 5 4 1 2 5 3	d s m f d m r s f d r s m
j.	3 1 2 5 3 4 1 5 4 3 1 5 3	m d r s m f d s f m d s m
k.	1 3 2 5 3 4 5 1 3 2 5 1 2	d m r s m f s d m r s d r
l.	1 5 4 1 3 2 1 5 1 2 5 3 1	d s f d m r d s d r s m d

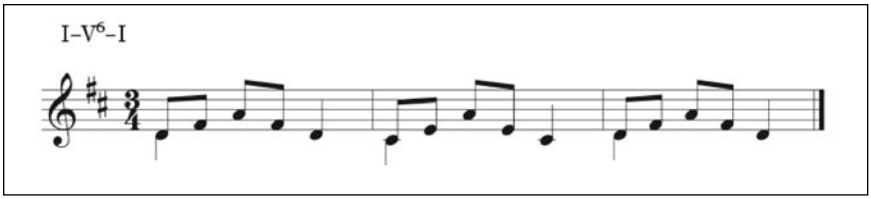
Notes on the Staff

Tonic is on the second space below the staff.



Example 3: Relative-Pitch Exercises from Yasui and Trubitt *Basic Sight Singing* (p. 27)

Another fruitful relative-pitch activity is to sing chordal arpeggiations on scale degrees from Roman numerals in various keys. Students arpeggiate harmonies up and down, as Example 4 shows, singing at sight from a succession of Roman numerals with no staff notation or key specified.[18]



Example 4: Singing Chordal Arpeggiations from Roman Numerals

The instructor can set a different key for each progression by playing tonic and dominant at the keyboard before students begin singing. Progressions with stepwise bass lines, which provide practice reading inversion symbols, make better-sung patterns (and help minimize parallel fifths). Sung harmonic progressions can begin quite simply in the early stages of study, and then can continue throughout the curriculum by incorporating more challenging chromatic harmonies as study progresses.[19]

[18] Karpinski (2000) discusses this technique (p. 180) and gives an example using simple diatonic chords, as well as a more advanced example with an augmented-sixth chord. Singing arpeggios from Roman numerals is featured in a number of recent aural skills texts, including Karpinski (2007) and Phillips *et al.* (2005).

[19] This activity can, conversely, serve as a powerful lesson in chord spelling for non-AP students when the key is announced and students are asked to sing the progressions on letter names (or fixed-do syllables) instead of scale-degree numbers. While AP students are much more likely to excel at this (because it is quite natural for them to supply letter names for sung pitches), non-AP students will be challenged to think concretely in each key requested in order to spell the harmonies correctly.

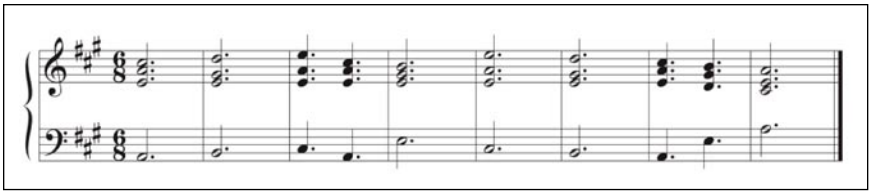
As students advance, they will sing more often from traditional notation, but the instructor can continue to encourage relative-pitch strategies by asking the class to sing in keys other than notated. This strategy can help with melodic tessitura problems as well—if a melody lies too high, simply sing in a lower key. Although AP students who are asked to sing a melody in a key other than notated sometimes look upon transposed sight singing as persecution for having AP, complaints will be fewer if the instructor has prepared the class carefully for this activity with a unified relative-pitch pedagogy throughout the curriculum—by singing from numeric notation, by vocalizing and improvising in various keys using numbers, by singing from the clef-less staff, and so on.

Dictation

Dictation can be an easy matter for AP students, who simply hear the notes and write them. There is little pedagogical value in such an activity for AP students, who are not learning anything new and can easily become bored after one or two hearings. Two teaching strategies—familiar from our discussion of call-and-response activities—will help to ground this activity in the realm of relative-pitch skill development. First, the strategy of avoiding or delaying staff notation should be maintained. Consider the typical harmonic dictation exercise: repeatedly playing a chorale phrase in four-part harmony and asking students to notate on a grand staff. AP students typically write down the pitches of the soprano, alto, tenor, and bass lines as four melodic dictations, then go back to analyze the harmonies from these pitches. While this strategy produces a correct answer, the Roman numerals that result are an analytical rather than a perceived product. We can encourage functional hearing when giving harmonic dictation by eliminating staff paper altogether. Before playing the chorale phrase, the instructor would not announce a key, nor would students write any clefs or key signature on staff paper. Rather, on regular notebook paper, students write the soprano and bass lines as scale-degree numbers and place a Roman numeral beneath each soprano-bass simultaneity, as shown in Example 5.[20] This technique reinforces knowledge of scale-degree membership within each harmony and

[20] Examples 4 to 6 are adapted from exercises in Phillips *et al.* (2005). See especially pages 266-268 (Ex. 4 and 5), and 137 (Ex. 6).

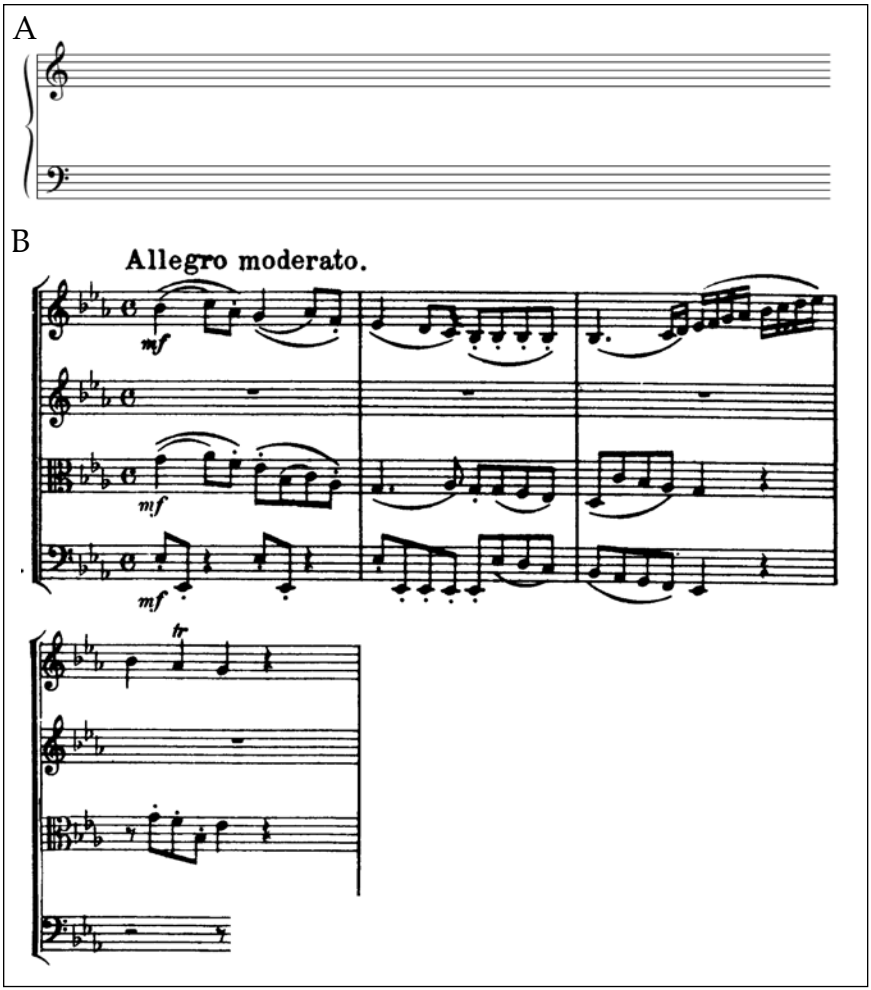
helps students to learn common harmonizations of soprano-bass patterns. The instructor can categorize common harmonizations—for example, bass moves $\hat{1}$-$\hat{2}$-$\hat{3}$ with the soprano $\hat{3}$-$\hat{4}$-$\hat{5}$, bass moves $\hat{1}$-$\hat{2}$-$\hat{3}$ with the soprano $\hat{3}$-$\hat{2}$-$\hat{1}$, or bass moves $\hat{5}$-$\hat{5}$-$\hat{1}$ with the soprano $\hat{3}$-$\hat{2}$-$\hat{1}$—so that students know which Roman numerals to anticipate given the soprano-bass context. Emphasis upon scale-degree patterns and their possible harmonizations helps dissuade AP students from writing letter names or pitches on a staff, in favor of learning tonal patterning. Once students have completely notated the scale-degree and Roman numeral representations, they may be asked to transcribe the progression onto the staff in the key played or perhaps in some other key.



Example 5: Harmonic Dictation without Staff Notation

Melodic dictation can be taught by a similar method. Students might be asked initially to identify the meter and take rhythmic dictation from a performed melody, and then on subsequent hearings to write scale degree numbers of the melody above or below the notated rhythms. As with harmonic dictation, no key or starting pitch is announced. Karpinksi (2002, pp. 89-91) recommends a similar method for dictation away from the staff, which he calls "protonotation." This dictation strategy is incorporated systematically in Karpinski (2007), and serves as a reminder that all activities recommended here for teaching AP listeners are equally appropriate as strategies for non-AP students. Once the melody has been completely notated with scale degrees, that information may be used to transcribe the melody on to the staff, either in the key played or in another key. Because some students will be required to transpose at sight in careers as practicing musicians, it can be helpful to demonstrate how scale-degree notation aids in transposing music. Asking students to transcribe their scale-degree notation into more than one key addresses this objective while also reinforcing the relative-pitch aspects of dictation for AP students.

Finally, contextual listening exercises—which require students to take dictation and identify musical structures (intervals, chords, cadence or phase types, and so on) from "real" musical contexts—provide an important opportunity for AP students to practice relative-pitch skills in timbres other than piano.[21] Example 6 is a contextual listening exercise, based on a short excerpt from a Haydn string quartet that is designed



Example 6: Dictation from Music Literature

[21] Contextual listening exercises may be found in Wittlich and Humphries (1974), Advanced Placement Exam preparation materials, and Phillips *et al.* (2005), or may be created by the instructor.

to practice dictation skills in the musical context of a composition for strings. The exercise requires students to take dictation in scale degrees, transcribe in another key, and identify intervals in a musical context.

Conclusion

How has research in music cognition informed a pedagogy of relative pitch? First, work by Miyazaki and others reinforce anecdotal classroom evidence that some AP students would benefit from specific training in relative pitch skills. This has been a guiding factor in pedagogical strategy of avoiding pitch names and staff notation in any form for as long as possible. Instead, we choose activities that reinforce scale degree associations, by singing and improvising on scale degree numbers and by taking dictation in scale degrees rather than in pitches. Second, the white-key/black-key differences found by Miyazaki, Takeuchi and Hulse, and Marvin and Brinkman influenced the decision to make transposition an integral part of the curriculum—from transposing vocal warm-ups to transcribing dictation exercises in several keys. Third, another of Miyazaki's findings—on AP listeners' difficulties with out-of-tune musical contexts and with timbres other than piano—influenced our choice of dictation from real music using contextual listening exercises rather than (or in addition to) the more typical piano transcriptions. Finally, while the validity of the early-learning hypothesis is not universally accepted, converging evidence suggests that early training in music does play a role in AP acquisition (perhaps only in children who are genetically predisposed to acquire AP). For those who teach pre-collegiate music students, this suggests that relative-pitch singing games (on scale degrees or moveable-do solfège) such as the call-and-response activities described above are an important way to exercise non-AP abilities in children who show early evidence of AP.

To close, we return to the quandary discussed at the outset—the mixed population of AP and non-AP students, and the question of whether AP students should be required to enroll in aural skills classes at all. Placement questionnaires for incoming students ought to ask students whether they have AP, along with questions about previous theory study. Individual placement interviews should be scheduled for those who answer in the affirmative. In such an interview, the examiner might have the student identify a set of

intervals as rapidly as possible, to assess whether the student is "converting" from pitch names to intervals names. The interviewer should also ask AP students to sing a melody at sight in a key other than notated and to write a simple diatonic dictation in a key other than that played. If a student can perform these tasks relatively effortlessly, then he or she should indeed be exempted from the beginning levels of aural skills instruction. If, on the other hand, it is clear that the AP student struggles with relative-pitch tasks, then enrollment in aural skills is appropriate—as is a pedagogical focus on relative-pitch activities like those discussed here. While absolute pitch can be a valuable asset to musicians, ideally AP musicians should develop relative-pitch skills as well. This dual perspective on musical structure will give these musicians more flexibility in diverse musical situations and will enrich their functional hearing of tonal relations.

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Transformational Theory in the Undergraduate Curriculum: A Case for Teaching the Neo-Riemannian Approach[1]

Nora Engebretsen and Per F. Broman

In recent years, neo-Riemannian or tonal transformational theory has generated considerable interest within the academic music theory community, primarily due to insights it offers into the organization of passages that are triadic but not functionally coherent.[2] With the 2003 publication of Miguel Roig-Francolí's *Harmony in Context*, neo-Riemannian theory made its début in an undergraduate harmony textbook, appearing as part of a chapter devoted to nonfunctional pitch centricity in late-nineteenth- and early-twentieth-century music.[3] As brief as Roig-Francolí's presentation is, any inclusion of neo-Riemannian theory in an already crowded undergraduate curriculum raises the question: what can our students gain through study of the neo-Riemannian approach?

This paper provides an introduction to neo-Riemannian theory, outlining the material we choose to cover with our students, including analytical examples and composition and aural skills exercises departing from our experiences in the classroom, and presents arguments in support of incorporating the neo-Riemannian approach into the undergraduate core curriculum. We suggest that the study of neo-Riemannian theory serves at least two pedagogical ends: first, it serves well as a capstone to undergraduates' study of tonal harmony, insofar as it leads students explore notions of tonality and musical coherence and also to engage the limits of analytical systems designed to model functional tonal organization (understood here in a broad sense, as embracing normative harmonic and contrapuntal procedures);

[1] An earlier version of this paper was read at the College Music Society Annual Meeting, San Franscisco, on November 4, 2004. We are grateful for the comments we received on this occasion, as well as for those from the three anonymous readers on JMTP's Editorial Review Board.

[2] In addition to the works listed in our references, see the *Journal of Music Theory* 42/2 (1998), which was devoted entirely to this topic.

[3] Roig-Francolí 2003, 863–71. Roig-Francolí avoids the need to explain the historical association carried by the "neo-Riemannian" label by instead referring directly to the "PLR model" and "parsimonious voice leading."

and second, neo-Riemannian theory can help students bridge the gap between common-practice harmony and twentieth-century techniques through the introduction both of general notions about the basis of musical coherence and of specific concepts central to set theory and collectional approaches.

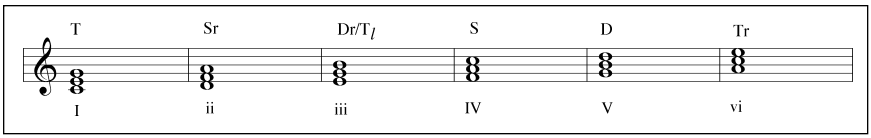
As our presentation will suggest, we favor introducing the neo-Riemannian perspective toward the end of our students' exploration of chromatic harmony, in the context of a survey of linear chromatic techniques, which is in keeping with Roig-Francolí's placement of the topic in his text, and then revisiting the neo-Riemannian approach, in conjunction with neo-tonal repertoire, as part of a survey of analytical approaches to twentieth-century music. This scheme encourages students to consider matters of tonal coherence in greater depth and from two different historical perspectives; however, we believe that many of the benefits discussed below accrue with even brief exposure in the context of an introductory chromatic harmony course.

Teaching the Neo-Riemannian Approach: Some Preliminaries

Richard Cohn (1998a, 169) has framed the central question motivating neo-Riemannian theory as follows: "if this music [music that is triadic but functionally indeterminate] is not fully coherent according to the principles of diatonic tonality, by what other principles might it cohere?" The neo-Riemannian response recasts elements of Hugo Riemann's late-nineteenth-century harmonic theories within a transformational framework to account for relationships among triads on the basis of voice leading rather than root progression or function. Although the neo-Riemannian transformations can be defined expediently without reference to Riemann's function theory—indeed, this is the course that Roig-Francolí chooses in his presentation—our preference is to engage the historical precedent. Our reasoning is twofold: first and foremost, we find that this approach encourages students to relate the neo-Riemannian transformations to familiar diatonic progressions, strengthening their sense of a connection between the functional progressions they have studied and the non-functional successions to be modeled using the neo-Riemannian techniques; and second, we find that such historical "digressions" pique the students' curiosity about different theoretical traditions.

Riemann's system of harmonic functions shares certain traits with Roman numeral analysis. Notably, both describe the relationship of the diatonic triads to their referential tonic, but whereas Roman-numeral labels reflect scalar ordering, Riemann's labels convey a hierarchical interpretation of primary and secondary chords. Riemann's system emphasizes three fundamental or primary triads—Tonic, Subdominant, and Dominant—from which all other chords derive. The remaining triads—the secondary triads—are understood to derive from one or more of these three fundamental triads via Relative, *Leittonwechsel*, or Parallel relationships.[4]

Example 1 gives the Riemannian labels for the diatonic major and minor triads in a major key. The triad on the sixth degree, for instance, is normally called the "Tonic Relative" (Tr). This is familiar enough to students from their knowledge of relative keys, and with prompting they can easily identify the triad on the second scale degree as the "Subdominant Relative" (Sr), reflecting what they already know to be a close connection between IV and ii(6). The labeling of the triad built on the third scale degree is a little more complicated. Following the same logic applied in labeling the supertonic and submediant triads, the mediant triad would be the "Dominant Relative" (Dr). This label is often problematic, however, in that it implies a close functional relationship between iii and V, even though the mediant triad is not necessarily affiliated with the dominant. (Riemann's theory puts a great stress on the way we perceive a particular chord to behave within a progression, so it is important to label the chords to reflect their functions.) The more common role of iii is as a substitute for or as an extension of I, as in the progression I–iii–V or I–iii–IV. For this reason, the mediant is often labeled in a way that emphasizes this connection to the Tonic.



Example 1

[4] The Relative, *Leittonwechsel* and Parallel relations are Riemann's *Parallel*, *Leittonwechsel*, and *Variante* relations, respectively. To avoid confusion, we use only the standard English names, here and in class. All three relationships are presented in Riemann's *Vereinfachte Harmonielehre* of 1893, but the Parallel relationship does not appear in Riemann's functional symbology until 1918, in the sixth edition of the *Handbuch der Harmonielehre* (Mooney 1996, 234–35).

The standard Riemannian term for this relation is *Leittonwechsel* or "leading-tone change"—the root of the major triad is displaced down by half step to yield the Tonic *Leittonwechsel* chord (T_l).[5] The final relationship that Riemann invokes, the Parallel, is again a familiar one from the study of key relationships, and students also immediately associate it with the simple modal alterations they have studied, such as the use of the minor subdominant in a major key or of the Picardy third in a minor key.

The relationships just described are part of Riemann's original harmonic theory. How does this all relate to *neo*-Riemannian theory? David Lewin initiated the neo-Riemannian project in his seminal 1982 article, "A Formal Theory of Generalized Tonal Functions," and further developed his ideas in his 1987 book *Generalized Musical Intervals and Transformations*. In these works Lewin introduced the notion of a transformational approach to triadic relations and also forged the connection between this approach and Riemann's theory. Brian Hyer and Richard Cohn have built upon Lewin's work. Cohn, in particular, has been instrumental in establishing Riemann's Relative, *Leittonwechsel*, and Parallel relationships as the fundamental transformations of the neo-Riemannian approach and in exploring the musical—and mathematical—potential of their combinations.[6]

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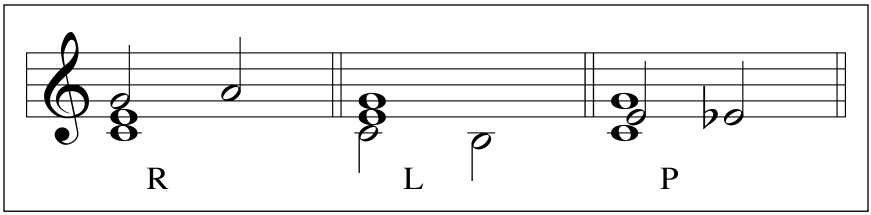
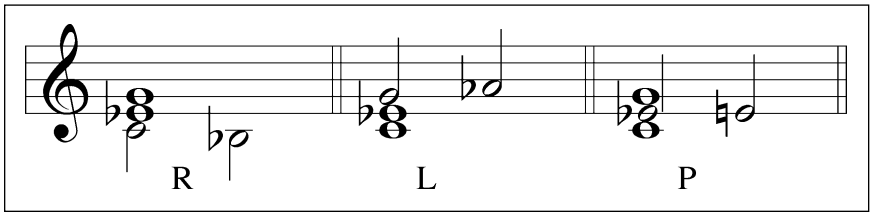
[5] Riemann indicates the Tonic *Leittonwechsel* chord by superposing the symbol "<" over the T. We prefer the subscripted "*l*" in our teaching, as its meaning is more directly apparent and also because it avoids the issue, at this stage, of the difference between major and minor *Leittonwechsel* chords. In a minor key, the tonic's *Leittonwechsel* chord would involve an upward half-step displacement of the tonic's fifth (e.g., the *Leittonwechsel* chord of an A-minor tonic would be an F-major tonic, with E being displaced by F) and would be indicated by superposition of the symbol ">" over T. The subscripted *l* avoids discussion of two different symbols for the *Leittonwechsel* relation.

[6] Riemann's Relative, *Leittonwechsel*, and Parallel relationships appear in Lewin's works (as REL, LT, and PAR) in conjunction with a number of other relationships, including DOM, SUBD, MED, SUBM, and SLIDE (Lewin 1987, 176–8). Hyer (1989, 1995) focuses on the interaction of REL, LT, PAR, DOM and SUBD/DOM^{-1}—which he re-labels R, L, P, D and D^{-1}—and explores the structure of the mathematical group that they generate. Cohn (1996, 1997) drops Hyer's D and D^{-1} to focus on the R, L, P and their compounds. For a more complete account of the development of neo-Riemannian theory and a critical comparison of various neo-Riemannian systems, see Kopp 2002, 142–64.



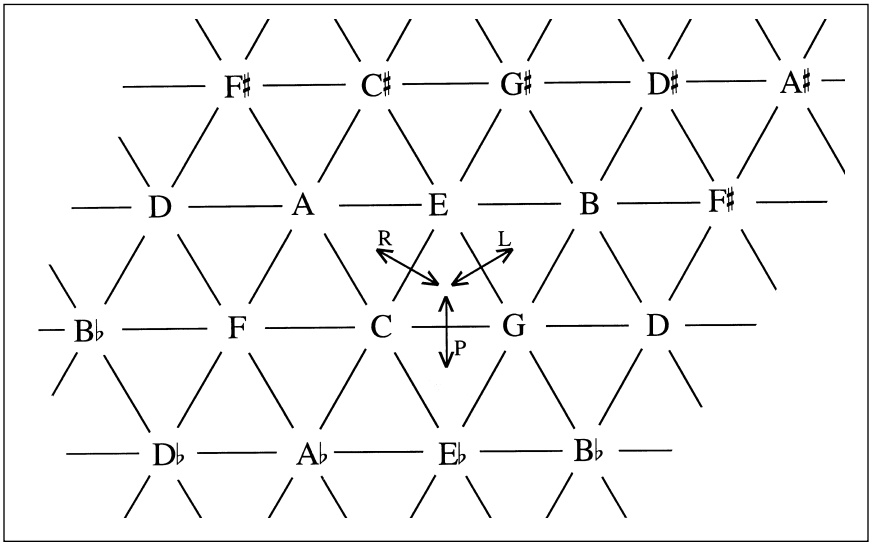
Example 2a



Example 2b

Neo-Riemannian theory appropriates Riemann's Relative, *Leittonwechsel*, and Parallel relationships—which are usually referred to in abbreviated form as R, L, and P—and recasts these relationships in dynamic terms as voice-leading transformations. These transformations have been formalized in the literature, but for our purposes, definition by example will suffice. As shown in Example 2a, the R operator transforms a C-major triad into an A-minor triad and vice versa; the L operator transforms a C-major triad into an E-minor triad and vice versa; and the P operator transforms a C-major triad into a C-minor triad and vice versa. All three operators are involutions—meaning each is its own inverse, that is, each undoes itself. Example 2b shows the results of applying the R, L, and P transformations to a C-minor triad, rather than to a C-major triad as in Example 2a. The examples highlight the different effects the transformations have when applied to major and minor triads, and specifically illustrate the vertically mirrored voice leading. The RLP transformations are usually characterized in terms of the parsimonious voice leading they entail—in each case, two notes are preserved while a single voice moves by step to effect the change of harmony. R preserves the triads' major third; L preserves the triads' minor third, and P preserves the triads' fifth. R involves whole-step motion in the remaining voice, whereas L and P involve half-step motion. This view of the transformations connects directly with the normative common-practice voice-leading procedures that the students have internalized through their study of part writing.

In addition to redefining the original Riemannian relationships as transformations, neo-Riemannian theory discards their reference to diatonic context: R transforms a C-major triad into an A-minor triad, whereas Riemann would have classified the A-minor triad with respect to a particular key, as the Tonic Relative in the key of C or as the Subdominant Relative in G, and so forth. This is important in that the abandonment of diatonic context allows neo-Riemannian theory to accommodate a full range of chromatic relationships among triads.



Example 3

The connection between any two given triads is easily identified through reference to the *Tonnetz* or Table of Tonal Relations, given in Example 3, which serves as a map of LPR relations. In more formal terms, the *Tonnetz* constitutes the geometry for the mathematic group associated with the action of the LPR transformations on the consonant triads—a group structurally analogous to the standard T_n/T_nI group of atonal set theory. On this table, which appeared in various forms in nineteenth- and early-twentieth-century harmony treatises, triads are represented as triangles and the LPR transformations can be visualized as flips across the triangles' edges.[7] The two notes preserved as common tones lie on the axis about which the triangle flips: L flips triads across the upper-left to

[7] On the history of the *Tonnetz*, see Mooney 1996.

lower-right axis, P flips triads across the horizontal axis, and R flips triads across the lower-left to upper-right axis. Nineteenth-century theorists generally regarded the *Tonnetz* as a map of relationships under just intonation, but neo-Riemannians almost exclusively use the equal-tempered version. Under equal temperament, each pitch class appears just once on the *Tonnetz*; the plane shown here should be understood to wrap around so that repeated or enharmonically equivalent note names occupy a single point on the surface of a torus—a donut shape. Thus, examining the *Tonnetz*, as we trace an RPRP (R-then P-then R-then P) path from the central C-major triad to the F♯-major triad northwest of it on the Table, it should be understood that the enharmonically equivalent B♭ in the lower right of the diagram supplies the A♯ that would complete the F♯-major triad. Neo-Riemannians refer to this sort of mapping of progressions on the *Tonnetz* as "navigating the *Tonnetz*."[8]

As an introductory exercise, students are encouraged to explore the *Tonnetz* by identifying the shortest path between a given pair of triads, as in the example above, by calculating the result of applying a given compound transformation (such as RPRP) to some given triad, and, as Roig-Francolí recommends, by composing short progressions based on various combinations of L, P, and R—on paper and/or improvising at the keyboard.

Another preliminary exercise we have found helpful in familiarizing students with the LPR operations, in reference to the Table or not, is an ear-training exercise. We divide the class into three sections, ask each section to sing a different member of a specified major or minor triad, and then give them a neo-Riemannian operator. The students have to realize which chord member they are singing (root, third, or fifth) and what to do when asked to change the chord via R, L, or P. Although the individual transformations are relatively simple to perform in isolation, when they are applied in succession, this exercise can prove quite difficult. The R and L operators pose particular difficulties in this context, as they affect different chord members depending upon the quality of the triad to which the transformation is applied. The level of difficulty also depends on the specific combination of transformations selected and the relative functionality of the resulting progression. Departing from a C-major triad, for example, the transformations R, then L, then P yield the succession C→Am→F→Fm, which is a familiar functional

[8] After Cohn 1997.

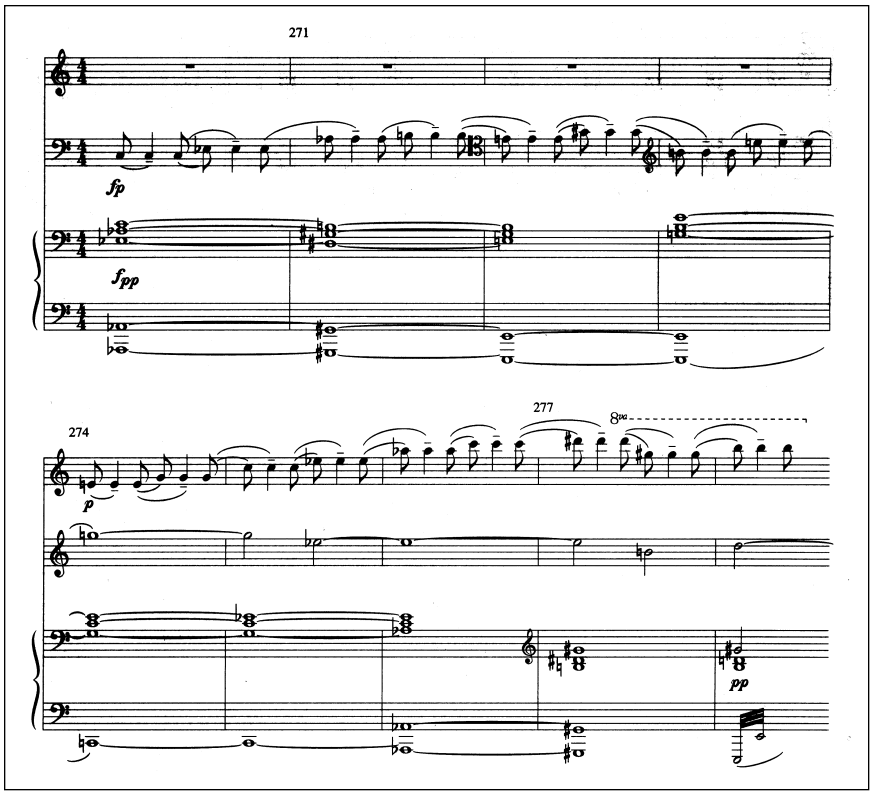
progression (I–vi–IV–iv) in C-major, whereas the transformations P, then R, then P, then L yield the succession C→Cm→E♭→E♭m→C♭, which is difficult to shoehorn into any meaningful functional context and is not a succession that students are likely to have encountered in their aural skills work.

Teaching the neo-Riemannian Approach: Generated Cycles and Non-Functional Successions

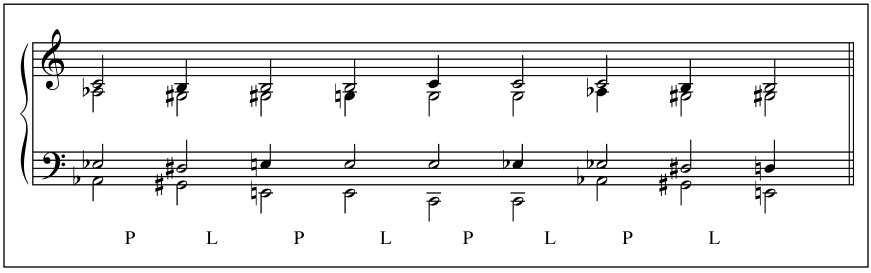
As students develop facility with the LPR transformations and *Tonnetz* navigation, they quickly discover that it is possible to move between any two of the twenty-four major and minor triads in five steps or less. The possibility of connecting even the most remotely related chords recalls the criticism leveled by the nineteenth-century theorist Arthur von Oettingen that this kind of approach leads to a "chaos of possibilities" (1866, 156). Guided by musical practice, however, neo-Riemannian analysts have tended to privilege patterned motion that involves parsimonious voice leading at each step and results in cyclic closure. Cohn, in particular, has been instrumental in defining an analytical practice centered on combinations of the LPR transformations that yield closed cycles of triads.[9] Three such cycles are generated via pair-wise applications of LPR transformations—via "binary generators" in Cohn's (1997) terms—and two of these binary cycles constitute more tractable subgroups of the full LPR group. A fourth cycle type, generated by the repeated application of all three transformations in some fixed order, does not represent a subgroup but is nevertheless very much of interest musically.

Much of Cohn's analytical work has focused on what he describes as "maximally-smooth" cycles generated by alternately applying L and P—the two transformations involving half-step displacements. In "Maximally Smooth Cycles, Hexatonic Systems, and the Analysis of Late-Romantic Triadic Progressions," Cohn offers an example of a complete LP cycle found just prior to the recapitulation in the first movement of Brahms's Double Concerto (mm. 270–77). This example, which also appears in Roig-Francolí's text, is reproduced as Example 4: Example 4a gives the score and 4b a reduction showing the essential voice leading underlying the progression (the single pitch that changes from one chord to the next is represented with a solid note head).

[9] Our presentation, like Roig-Francolí's, follows from the discussions of these cycles in Cohn 1996 and 1997, in particular.



Example 4a



Example 4b

Before diving into a transformational reading—indeed, before even introducing the LPR approach—we ask our students to listen to and discuss the passage. Drawing on their recent studies in chromatic harmony, they are quick to note that the bass descends by major thirds, symmetrically dividing the A♭/G♯ octave, and that this symmetrical division entails motion through an enharmonic seam and is problematic from the perspective of diatonically

oriented Roman-numeral analysis. The concept of modal mixture is also readily invoked to describe the major/minor pairings of triads, though the initial A♭-major/G♯-minor pair does cause some confusion in this regard. With some prompting, students note that although the passage functions much like a sequence—prolonging the A♭ tonicized in m. 270 via a series of non-functional successions—it is not strictly sequential, and also that the most characteristic feature of the sustained accompaniment, other than the bass-line descent by thirds, is the parsimonious voice-leading motion between triads.

Once familiar with the LPR transformations, students readily focus on these voice-leading connections and describe the passage as comprising a cycle of triads alternately related by P and L transformations. As shown in Example 5, there are four such cycles, which partition the twenty-four major and minor triads into four discrete tonal regions.[10] Mapped on the *Tonnetz*, each LP cycle runs along a lower-left to upper-right alley. These cycles are often referred to as a hexatonic cycles because each engages all and only those pitch-classes forming a hexatonic collection. The pitch class content of each cycle is shown to its right on Example 5.[11]

P	L	P	L	P	L		
C	Cm	A♭	G♯	E	Em	(C)	[3478E0]
D♭	C♯m	A	Am	F	Fm	(D♭)	[014589]
D	Dm	B♭	B♭m	F♯	F♯m	(D)	[12569T]
E♭	E♭m	B	Bm	G	Gm	(E♭)	[2367TE]

Example 5

[10] Cohn (1996) develops this characterization of the cycles as tonal regions, folding the four hexatonic cycles into a hyper-hexatonic system and then describing motion between cycles as modulatory. We do not include this material in our introductory presentations of the neo-Riemannian approach, nor does Roig-Francolí. Those interested in pursuing this topic with their students might also consult the analysis of part of the first movement of Schubert's Piano Sonata in B♭ given in Cohn 1999, in which Cohn aligns three of the hexatonic cycles with tonic, subdominant, and dominant functions.

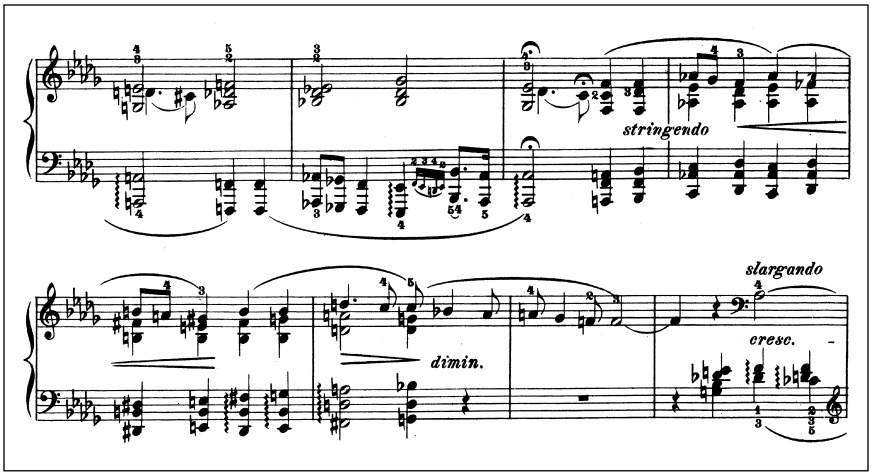
[11] Example 5 gives each cycle's pitch-class content in pc numbers; in class we use letter-names, as we do not introduce pc numbers until the final semester of our theory core.

We next ask our students to determine if similar cycles are generated when either L or P alternates with the slightly less parsimonious R transformation, which involves a whole-step rather than half-step voice-leading displacement. Applied in alternation, the P and R transformations partition the consonant triads into three cycles of eight triads each, as shown in Example 6. Whereas each LP cycle exhaustively engages a unique hexatonic collection, each PR cycle exhaustively engages a unique octatonic collection. Likewise, whereas LP cycles feature an overall pattern of root motion by major third, PR cycles—which thread along the upper-left to lower-right alleys of the *Tonnetz*—feature overall root motion by minor third. Cohn (1997, 35) offers an example traversing a complete PR cycle taken from the opening Andante of the Overture to Schubert's opera *Die Zauberharfe* (also known as the "Rosamunde Overture"), mm. 8–32.

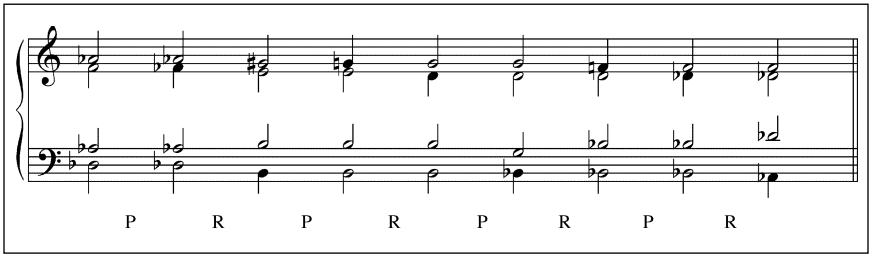
P	R	P	R	P	R	P	R		
C	Cm	E♭	E♭m	F♯	F♯m	A	Am	(C)	[0134679T]
D	Dm	F	Fm	A♭	G♯m	B	Bm	(D)	[235689E0]
D♭	C♯m	E	Em	G	Gm	B♭	B♭m	(D♭)	[124578TE]

Example 6

The LR cycle, which moves along the horizontals of the *Tonnetz*, differs from the LP and PR cycles in that it progresses through all twenty-four consonant triads, rather than partitioning them into shorter cycles. Cohn (1997, 36) characterizes the full cycle as being "too long to sustain compositional interest," and indeed the LR cycle is usually presented in a significantly truncated form. Cohn and Roig-Francolí nevertheless illustrate the cycle with an exceptionally long, 19-chord presentation drawn from the second movement of Beethoven's Ninth Symphony (mm. 142–71).



Example 7a



Example 7b

In our initial consideration of the three binary-generated cycles, we choose to present straightforward, cyclic examples in which successions modeled by the L, P, and R transformations occur as foreground events, highlighting the parsimonious voice-leading connections between chords as the sources of the successions' coherence. The neo-Riemannian approach need not be applied so restrictively, however. Roig-Francolí illustrates the PR cycle with a slightly more complicated example, from Liszt's *Consolation*, no. 4. Example 7 reproduces the relevant portion of the score (Example 7a) and Roig-Francolí's voice-leading reduction of the full cycle around which the passage is organized (Example 7b). Two aspects of this example are particularly noteworthy. First, the PR cycle here does not appear on the absolute foreground, but instead comprises the harmonic goals of a series of tonicizations (each member of the cycle is preceded by its own dominant, a technique familiar to students from their study of chromatic sequences). Second, the passage includes what Cohn (1996, 21) terms "mixed" motion—that

is, not strictly cyclic motion—through the PR system. The mixed motion here involves a skip over one step in the cycle (the G-major triad) and then a skip over two more steps on the way back to the opening D♭-major triad. (The familiar practice of skipping a segment of the diatonic ascending fifths sequence can provide students with a point of reference for these sorts of skips with respect to an underlying pattern.) We follow in-class discussion of this passage with an examination of Schubert's "Der Jüngling und der Tod" (D. 545), which features similar, relatively straightforward, mixed motion through a PR cycle but at a deeper middleground level.[12]

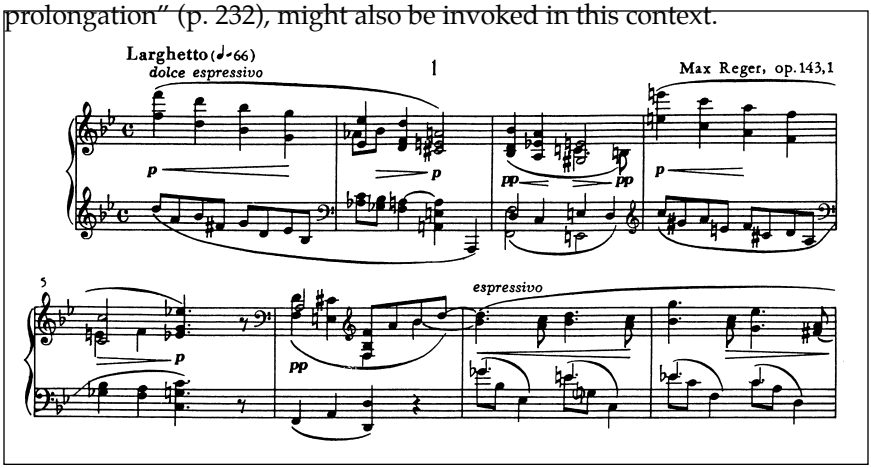
Mixed motion through cycles and the participation of cycles in middleground structure both provide openings for discussions about the notions of tonal organization implicit in the neo-Riemannian approach, as well as those associated with more functionally oriented linear/harmonic models. For instance, the coherence of complete, foreground cycles can be understood through reference to smooth voice leading, realized on the musical surface (as in Example 4), but can these voice-leading connections continue to serve as a source of coherence in a passage involving mixed motion, in which the underlying voice-leading cycle may or may not be easily intuited, depending on the order in which the triads are presented? How important is cyclic closure in creating a sense of coherence? How is tonal distance gauged in cyclically based contexts versus in functional contexts? The presence of middleground cycles, as in Example 7 and particularly at deeper levels, invites discussion of the intelligibility of embellished cycles and of interactions of different systems of tonal organization on different structural levels, and perhaps (if appropriate in the context of the course) comparison to traditional Schenkerian models of tonal organization.[13]

[12] Our discussion of this song follows the analysis presented in Siciliano 2005b. For those who prefer not to introduce the ideas of middleground cycles, mixed motion, and PR cycles all at the same time, Cohn 1996 provides examples of mixed motion through foreground LP cycles, including that of the more extensive mixed motion found in The Grail motive from *Parsifal*, a passage frequently analyzed in the neo-Riemannian literature. Siciliano 2005b presents an example of a complete, shallow-middleground LP cycle drawn from Schubert's E♭-major Trio (D. 929), which would also provide a nice transition from a simple LP cycle, as shown in Example 4, and the PR cycle shown in Example 7.

[13] Felix Salzer's (1962) extensions of Schenker's ideas to include "completely contrapuntal structures" and a range of prolongational practices, as well as his notion that "[t]onality is synonymous with chord

As noted above, both LP cycles and PR cycles engage symmetrical collections—the hexatonic and octatonic collections, respectively. As we examine passages organized around these cycles in class, we take the opportunity to return to previous discussions of tensions between the asymmetries of the diatonic collection and symmetrical divisions of the octave, and again to stress the importance of considering how these cyclically based passages are integrated into predominantly functional frameworks and into the formal structures of the pieces in which they appear. In Example 4, for instance, the cycle sets up the arrival in m. 278 of the retransitional dominant by prolonging A♭, the enharmonic equivalent of the leading-tone in the home key of A minor, which is then incorporated into the dominant-seventh on E.

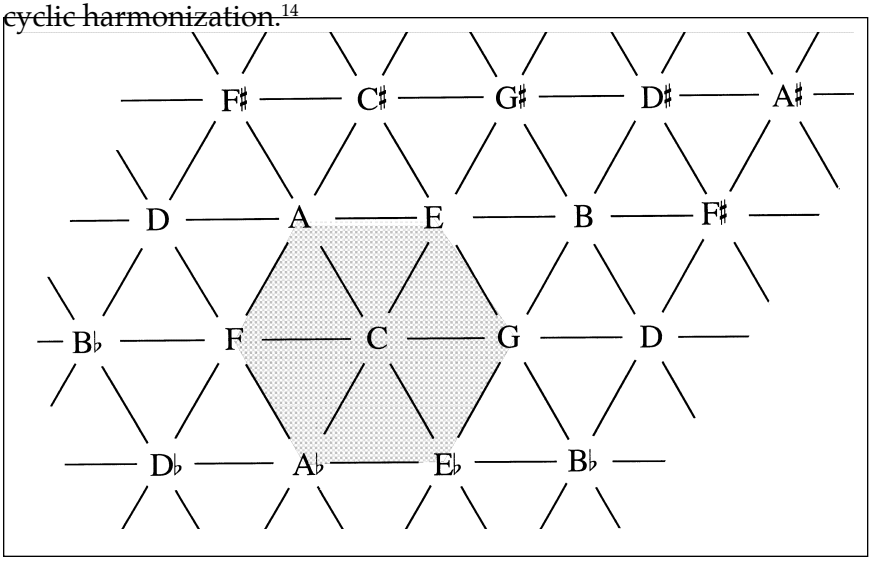
prolongation" (p. 232), might also be invoked in this context.



Example 8

As we discuss the LR cycle, which does not symmetrically divide the octave, our primary focus is on the relationship of the cycle to familiar, functional harmonic routines, underscoring the continuities between the LPR model and earlier studies of diatonic harmony. An example we find useful in this regard is the first piece from Reger's *Träume am Kamin*, which is given in Example 8. The piece begins with a portion of an LR cycle: D minor, B♭ major, G minor, E♭ major, with applied leading tones on off beats separating the chords. From E♭ major, we expect the cycle to continue on to C minor, A♭ major, and so on. The expected C-minor triad is omitted, and the next chord we hear is A♭ major. The initial portion of the

cycle could be interpreted as a progression from the D-minor tonic through a series of pre-dominant chords (VI–iv–♭II), reflecting the largely diatonic organization of short segments of the LR cycle, but it is not clear how the A♭-major triad could be accounted for without reference to the cycle. The return of the D-minor tonic in bar 2, in place of the expected F-minor triad, interrupts the cycle which gives way to a half cadence on A, bringing the opening gesture to a close. The initial theme returns in measure 4 supported by an LR cycle, now in A-minor: A-minor—F-major—D-minor. The expected B♭-major triad is omitted, but rather than skipping ahead to the next member of the cycle, G-minor, as the original statement did, the cycle is abandoned here. While the harmonization of the introductory gesture still follows the LR pattern, it now uses a short enough segment of the cycle—just three chords—that reference to the cycle is not necessary: the progression can be accounted for in terms of normal diatonic practice. This opening gesture appears several times during the course of the piece, with and without the cyclic harmonization.[14]



Example 9

Though coverage of the individual LPR transformations, their *Tonnetz* representations, and binary-generated cycles certainly

[14] Roig-Francolí includes an analytical exercise in his workbook (Example 30.1, Chopin's Ballade no. 1 in Gm, mm. 90–95) that uses an LR cycle fragment in a less functional setting.

would provide a sufficient introduction to the neo-Riemannian approach, we choose to include examples of ternary-generated cycles in our teaching as well, due to their musical interest and also to lay a foundation for a return to neo-Riemannian techniques in conjunction with neo-tonal repertoire during the final semester of our theory core.[15] These cycles, generically dubbed "LPR loops" by Cohn (1997, 43), are generated by the repeated application of all three of the LRP transformations in some fixed order, and they consist of all and only those six triads sharing a single pitch class in common. When mapped on the *Tonnetz*, these cycles form a loop around that single shared pitch class—Example 9 shows the LPR loop around C, which comprises the triads C, Cm, A♭, Fm, F, and Am.[16] Cohn notes that these cycles provide ideal, parsimonious harmonic support for a sustained pitch, and he cites several examples from nineteenth-century operatic repertoire, adding "Such progressions with their implications of inner action or turmoil beneath a placid and harmonious surface, were well suited to symbolize nineteenth-century notions about the relationship of the inner and outer worlds."[17]

Why Teach the Neo-Riemannian Approach?

The introduction to neo-Riemannian theory outlined above requires roughly two weeks to work through—admittedly a

[15] Roig-Francolí does not directly address LPR loops in his presentation of the LPR model, but encourages their discussion by including a passage featuring a fragment of LPR cycle as an analytical exercise in his workbook (Example 30.2, Verdi's, "Ah! Sì, ben mio," from *Il trovatore*, Act III, mm. 1–22).

[16] The specific order of the L, P, and R transformations depends upon the cycle's starting point and the direction of motion around the loop. The ternary generator PLR would produce the cycle shown here, departing from the C-major triad.

[17] Cohn 1997, 44–45. In addition to Verdi's "Ah! Sì, ben mio" from *Il trovatore* (see footnote 15), Cohn also examines Wagner's *Engelmotiv* from Act III of *Parsifal*, which features mixed motion through an LPR loop about A♭/G♯, and cites the opening of the Monks' Chorus from Verdi's *Don Carlos*, which features a fragment of the LPR loop about F♯/G♭. He also mentions the opening of Liszt's "Il Penseroso" (*Années de Pèlerinage, Deuxième Année*), which features mixed motion among four members of the LPR loop about E. Siciliano 2005b presents an LPR-based analysis of Schubert's "Trost" (D. 523). Those interested in including popular music in their classes can find an example of an LPR loop, from the chorus of "Shake the Disease" by Depeche Mode, in Capuzzo 2004, example 2.

substantial amount of class time in a semester already typically packed with a survey of various chromatic chords and linear processes, modulatory techniques, and stereotypical formal patterns. Indeed, one might reasonably question whether an approach designed to address a rather narrowly circumscribed repertoire—tonally indeterminate but predominantly triadic passages—is worth this time investment, especially as we have seen that aspects of some such passages might be addressed through reference to familiar topics such as equal divisions of the octave. Our answer is resoundingly "yes," and we return to our initial question: what can our students gain through study of the neo-Riemannian approach?

In the context of a semester devoted to the study of chromatic harmony, neo-Riemannian theory can serve a synthetic function, insofar as it draws upon and integrates into a coherent system aspects of a number of topics often presented in isolation—topics including modal mixture, equal divisions of the octave, chromatic sequences, and common-tone retention and semitonal voice leading as general principles. The resulting system is by no means applicable to all chromatic repertoire—indeed, the familiar topics it engages have broader applications taken individually—but it does offer insights into the organization of select passages that might otherwise be explained vaguely as "coloristic chord successions."[18] Moreover, it encourages students to move beyond an atomistic focus on certain chord types and procedures, deployed within a predominantly functional framework, and to embrace the possibility of another kind of tonal organization.

This realization that a break with traditional, functional tonal organization need not lead to chaos, but might instead make way for coherent organization according to some other set of principles, is a realization we hope our students will come to as we lead them through a survey of twentieth-century techniques. Typically, however, we ask them to make this leap at the same time they are

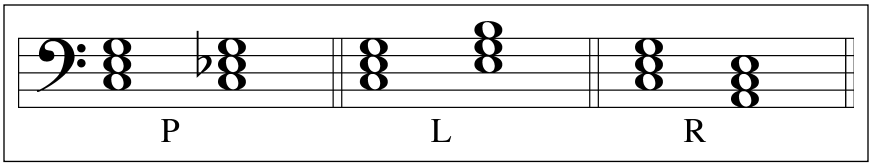
[18] Kostka and Payne 2004, 43ff. They recommend the default analytical technique of labeling root and sonority type. Clendinning & Marvin (2004, 606) are somewhat more specific about the basis of organization of these passages, which they discuss under the rubric of "Linear chromaticism" (chapter 29, Chromaticism): "In the Romantic era, some composers took the voice-leading idea even further, writing pieces where long spans of music consist of linear chords held together by their smooth, chromatic voice leading without much, if any, sense of progression or root motion."

grappling with and often overwhelmed by the nomenclature and concepts of set theory and the associated shift from a chordal/contrapuntal focus to a collectional focus (although there is no inherent contradiction between the two). Herein lies what we see to be the greatest benefit of teaching the neo-Riemannian approach: neo-Riemannian theory provides an intuitive way to bridge gaps between tonal and post-tonal techniques by laying the groundwork both for the acceptance of a model of coherence associated with transformations and their group-theoretic structure, and also for a gentle introduction to concepts such as inversion and set-class through reference to the familiar consonant triads.

Exposure to the neo-Riemannian approach in the context of chromatic harmony classes gives students an opportunity to explore a transformational perspective—to understand the P, L, and R transformations as "something one does to one triad to get another"[19]—in conjunction with familiar voice-leading routines between familiar chords, rather than in conjunction with the more abstract notions of pitch-class transposition and inversion, and under the additional burden of working with the less-familiar concept of pitch-class sets. Likewise, students' experiments with combinations of the LPR transformations, their confrontation of the "chaos of possibilities" presented, and their eventual understanding of some ways in which composers have contained this chaos, provide them with a frame of reference for processing the even greater chaos of possibilities posed by T_n/T_nI relationship among pitch-class sets. Moreover, the potential of the neo-Riemannian approach to supplement rather than supplant more traditional approaches to tonal music promotes the notion that multiple analytic approaches can co-exist and complement one another—a vital point in much analysis of twentieth-century music.

As important and potentially powerful as the connections between neo-Riemannian theory and set theory just described are, we do not find it necessary to dwell upon them in our teaching—we note the parallels and move on. There are, however, twentieth-century topics in relation to which we do make more direct and extended comparisons with neo-Riemannian theory. Among these are the concepts of pitch-class inversion and inversional equivalence, and the topic of symmetrical collections.

[19] This conception of transformation here follows Lewin's (1987, 177) explanation of a transformation as "something one does to a *Klang*, to obtain another *Klang*."



Example 10

Neo-Riemannian theory provides a nice introduction to inversion and inversional equivalence as the PLR transformations can be conceived of both as voice-leading transformations and as contextual inversion operations. As shown in Example 10, P inverts a triad so that its root and fifth map onto one another; L inverts a triad about its preserved minor third, flipping the major third from one side of the minor third to the other; and R inverts a triad about its preserved major third, flipping its minor third from one side of the major third to the other. These inversions are easily conceptualized in pitch space, through reference to staff notation, and in pitch-class space, through reference to the mod-12 clock face. As we map the results of PLR transformations on the mod-12 clock, we introduce the I^x_y-type labels as alternatives to the tonally oriented PLR labels. Once students understand the concept of inversion on the local, contextual level, it is a relatively small leap to the notion of inversion about an external referent, such as the 0–6 axis of the pitch-class clock face, and T_nI-type labels.

Insofar as inversional equivalence is concerned, we find reference to major and minor triads as objects of transformations to be useful both in highlighting the basis of the relationship and in conveying the loss of information that accompanies the shift from T_n- to T_nI-equivalence. The familiar description of major and minor triads' structure in terms of a minor third over a major third or vice versa—emphasized through the conception of PRL transformations as contextual inversions—helps to convey the notion of inversional equivalence, while students' hesitance to accept major and minor triads as being in some sense "the same" helps to sharpen the conceptual distinction between equivalence and identity.

The neo-Riemannian approach also provides an introduction to the symmetrical hexatonic and octatonic collections and their potential to support non-centric pitch organization. The introduction of these collections in the context of tonal harmony, rather than in the context of twentieth-century techniques, is particularly effective in that it encourages direct comparison of the symmetrical

collections and the asymmetrical diatonic scale, and of associated notions of tonality and tonal center—does cyclic closure, the return to start in a full, ordered presentation of an LP cycle, for instance, convey a privileged, even "tonic" status to that starting and ending chord? How does one know where one is, that is position find, in the cycles without any rare intervals? Even brief discussion lays a valuable foundation for study of these collections and centrality in twentieth-century contexts.

Revisiting the Neo-Riemannian Approach: Neo-Riemannian Transformations and Neo-Tonal Analysis

Beyond its utility in introducing twentieth-century analytic techniques, neo-Riemannian theory can itself be co-opted in the analysis of post-tonal repertoire. Some of these adaptations move beyond the scope of a typical undergraduate survey of post-tonal analytic approaches,[20] but we have found a return to neo-Riemannian techniques to be quite productive in conjunction with neo-tonal repertoire from the later twentieth century—a notion explored briefly in the most recent (2005) edition of Joseph N. Straus's *Introduction to Post-Tonal Theory*.[21]

Neo-tonal works, particularly those sometimes referred to as "neo-Romantic," often include passages that are triadic but tonally indeterminate—passages that in this respect resemble those Romantic-era passages around which the neo-Riemannian approach developed. Like their Romantic-era counterparts, these passages may include certain functional elements, such as anchoring cadences, but whereas the Romantic-era passages tend to be organized so as to integrate smoothly into otherwise fully functional frameworks, neo-tonal passages often appear in non-functional contexts or in some way mark their distance from the historical model. With this difference in mind, we ask our students

[20] Michael Siciliano (2005a), for instance, re-conceives LP cycles in terms of the characteristic "toggling," rather than parsimony, of their voice-leading patterns, notes that toggling cycles of 3-3(014), 3-4(015), and 3-11(037) trichords all generate the hyper-hexatonic, and explores the applicability of his toggling-trichord approach to passages from Schoenberg's atonal works.

[21] We do not happen to use Straus's text in our undergraduate core, but neo-Riemannian theory's transformational perspective and focus on voice leading would, of course, connect very naturally with Straus's overall approach.

to explore the organization of select neo-tonal passages, using neo-Riemannian techniques, and to compare and contrast their findings with the kinds of non-functional tonal organization encountered in Romantic music.

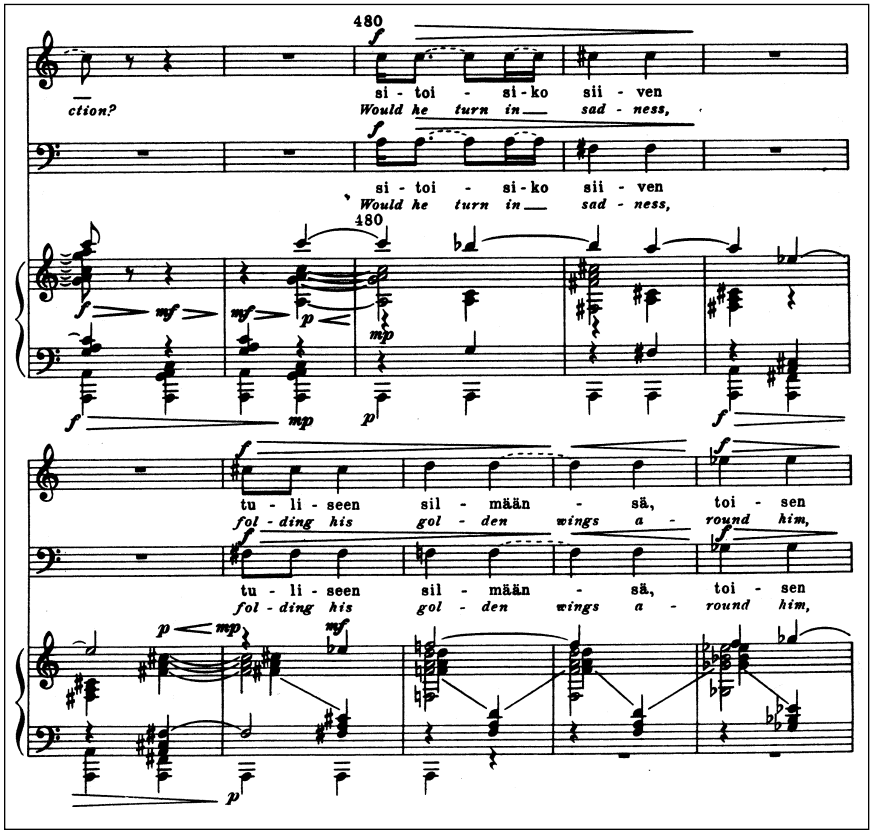
Although neo-tonal composers generally do avoid thoroughgoing use of functional tonal syntax, the disruption of functional tonality is not, given their historical position, their most pressing compositional concern. Instead, they grapple with the creation of their own alternative tonal languages and discovery of their own solutions to the challenges of projecting pitch centers and larger-scale tonal structures in the absence of a normative tonal practice. As such, the symmetrical hextatonic and octatonic cycles' destabilizing potential and capacity to support non-centric organization, which contributed to the rise of a fully chromatic tonal practice during the nineteenth century, hold less sway over neo-tonal composers.[22] Rather, the desire to project tonal centers and to sustain larger-scale structures leads neo-tonal composers down a somewhat different path, but one that also has precedents in nineteenth-century practices well modeled by the neo-Riemannian approach.

While a range of distinct tonal practices exist under the banner of neo-tonality, many neo-tonal composers seem to be attracted to tonal schemes well modeled by LPR loops. Neo-tonal composers' interest in these LPR cycles lies less in their potential for extra-musical associations or even for parsimonious voice leading—indeed, most neo-tonal composers seem not to privilege the maximally parsimonious LPR relations—and much more in their potential for projecting local tonal centers which in turn contribute in some way to larger-scale tonal organization. Here we present brief analyses of two passages reflecting two different uses of LPR loops that we use to spark discussion in class.

Finnish composer Aulis Sallinen's 1978 *Dies Irae* (for soprano, bass, male choir and orchestra) includes several predominantly triadic passages, including one that features rather straightforward use of LPR loops and also clearly illustrates one particular kind of role that LPR loops and their common-tone projections can play in non-functional tonal contexts. Example 11 (next page) reproduces mm. 478–501. As is often the case in neo-tonal works, the texture

[22] Nevertheless, it is certainly possible to find hexatonic (LP) and octatonic (PR) cycles in this repertoire. Straus (2005), for instance, provides examples of passages based on LP cycles. See his Examples 4-27 through 4-30 and related discussions.

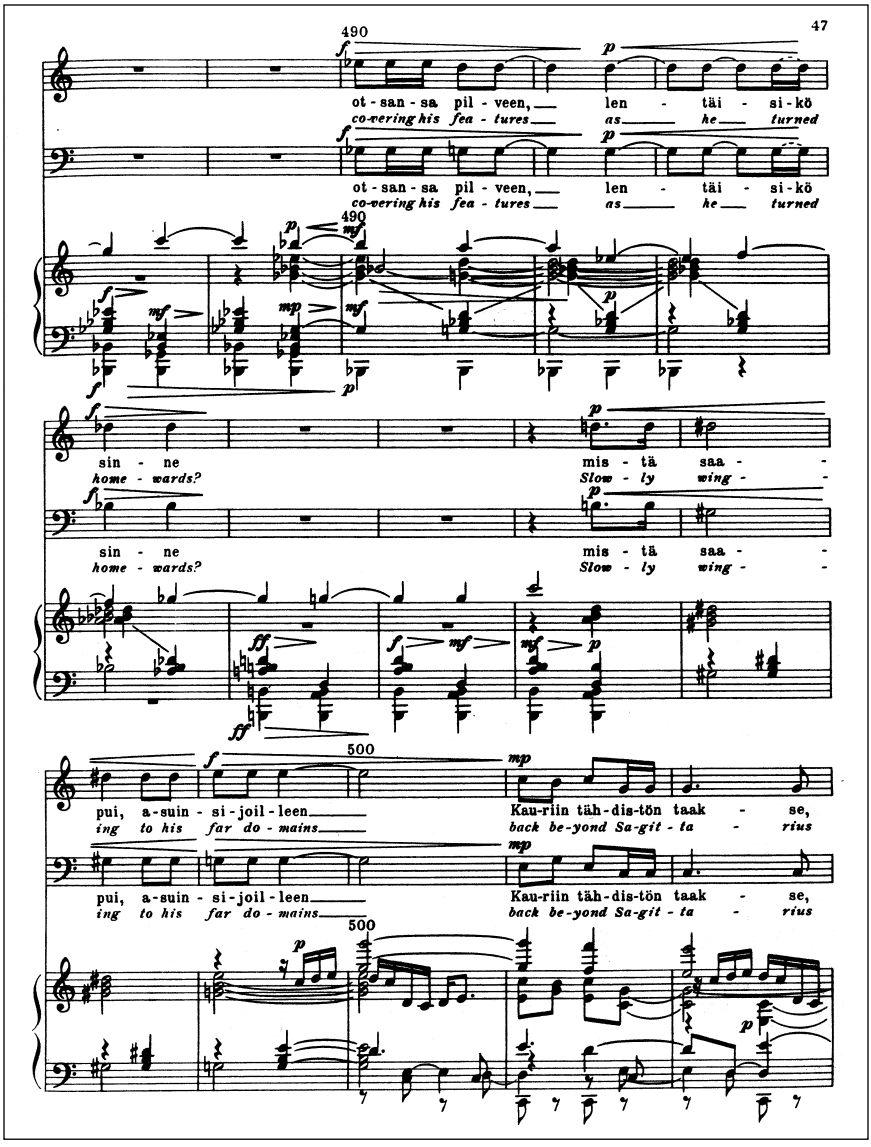
in the excerpt is layered, in the sense that the moving line at the top of the orchestral reduction—beginning C–B♭–A in m. 479 onward—sounds against but is not included in the triadic analysis. The opening of this passage features a series of third-related minor triads (Am, F♯m, Dm) over a prominent bass pedal on the pitch A.[23] The three triads are all members of the LPR loop about A: Am–PR→F♯m–LP→Dm. Each triad is repeated in various registers before the next chord enters, but at the points where harmony changes, the voice-leading connections between triads are realized as parsimoniously as possible.



Example 11

The next 3 triads to enter, E♭m, Gm, and B♭m are members of the LPR loop projecting B♭, which enters as a pedal tone underneath

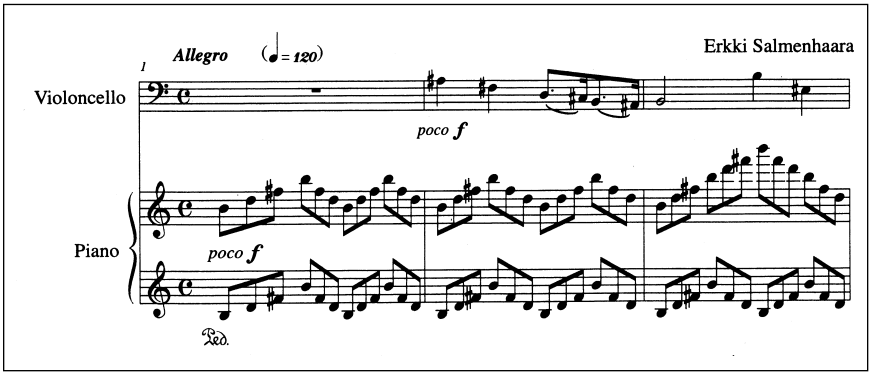
[23] The initial chord is actually an Am7th chord. Neo-Riemannian analyses often omit chordal 7ths, added 6ths and the like.



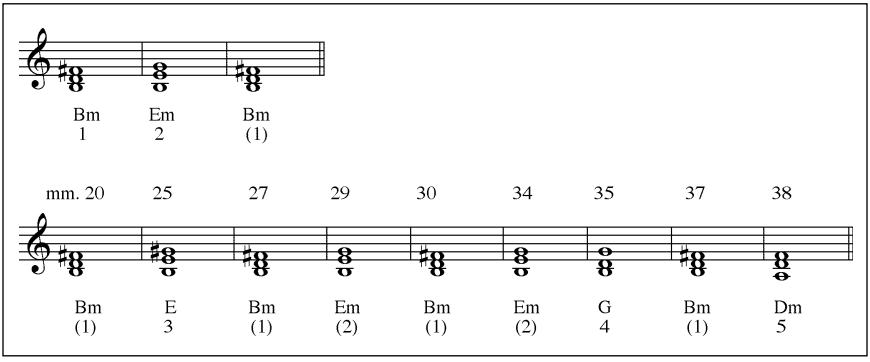
Example 11 *(continued)*

the progression in m. 488. This B♭ pedal eventually gives way to a pedal B♮, which is harmonized by the succession Bm, G♯m, Em—all members of the LPR loop about B. The chromatic ascent from one pedal tone to the next, A–B♭–B, projects a motive introduced at the outset of the piece, with the repetition of the chromatic ascent D♯–E–F over a B pedal.

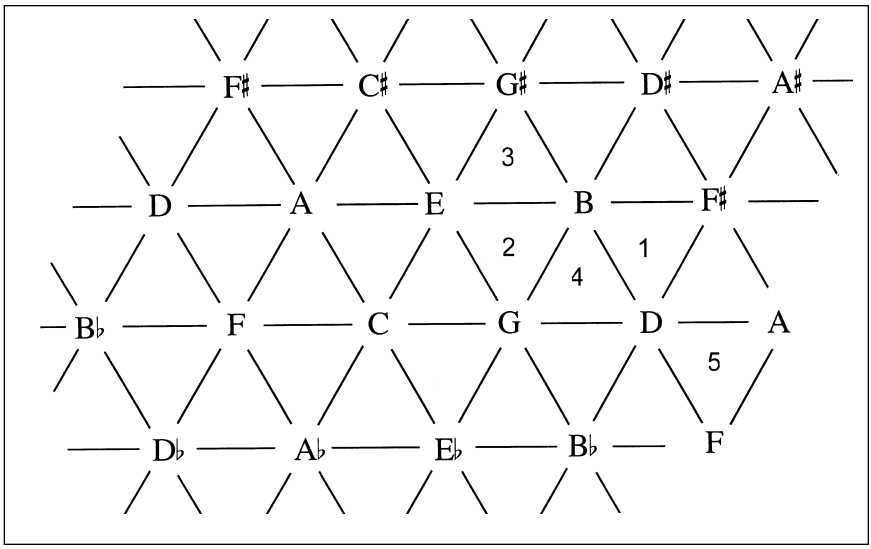
Finnish composer Erkki Salmenhaara also frequently engages LPR loops, often using the pitch-classes highlighted as common tones to create de facto prolongations and also to connect neo-tonal passages with tonal cadences, much as nineteenth-century composers would anchor their cycle-based progressions with strong cadences. The first movement of Salmenhaara's Sonata No. 2 for cello and piano (1982) presents what is initially a slowly unfolding triadic progression in near-constant arpeggiation against which melodic material is layered. Example 12 reproduces the opening measures to show the texture. As shown in the voice-leading reduction of mm. 1–38, Example 13a, the harmonic progression begins innocuously enough, with a plagal succession in B-minor, but as it grows increasingly chromatic it soon becomes difficult to interpret functionally.



Example 12

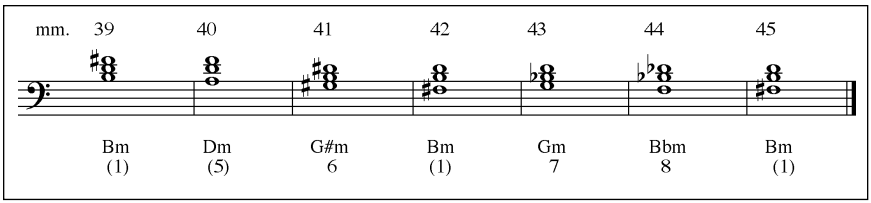


Example 13a

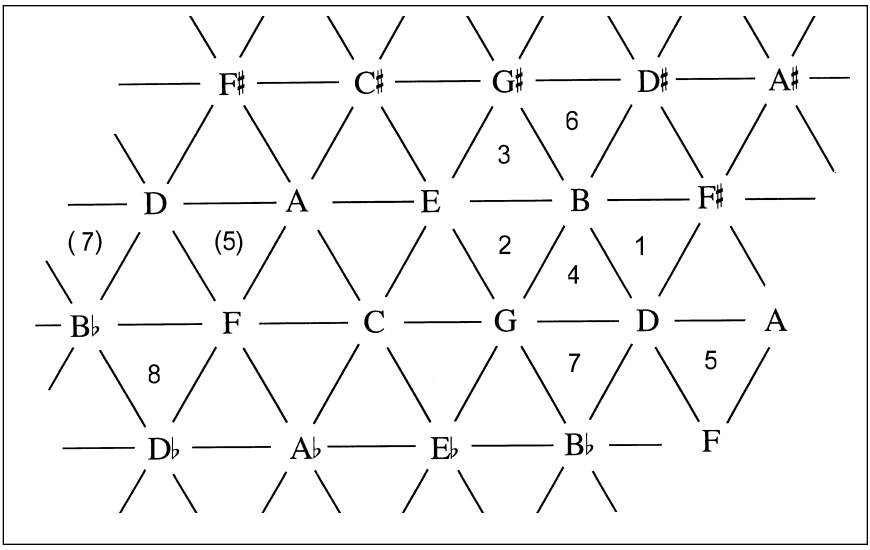


Example 13b

To facilitate mapping of the progression on the *Tonnetz*, chords have been numbered in Example 13, based on their order of initial entry, but note that these numbers do not always reflect order of succession: for example, after the second chord (E-minor) is heard in mm. 14–15 the opening B-minor triad returns in mm. 16–24 and it is from this B-minor triad that the next new chord, the E-minor triad in m. 25 is approached. Mapping the progression on the *Tonnetz*, Example 13b, reveals that the opening 38 measures consist of mixed motion—relatively smooth but generally non-parsimonious motion—within the LPR loop around the tonic B, which is temporarily abandoned upon the introduction of the D-minor triad in m. 38 (chord #5). When combined with the B-minor and G-major harmonies that immediately preceded it (#1 & 4), the appearance of the D-minor triad suggests a shift to the LPR loop around D, which interlocks with the original loop about B.



Example 14a



Example 14b

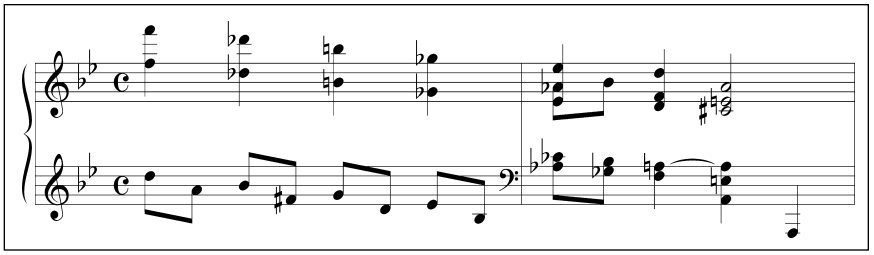
The next two new harmonies, shown in the continuation of the voice-leading reduction in Example 14a, the G♯-minor triad in m. 41 and the G-minor triad in m. 43 (#6 &7, respectively), each fit into one of the 2 interlocked cycles, Example 14b, but the move from Gm to B♭m in m. 44 (#7 to 8) suggests a shift into a third LPR loop, this time around B♭. This brief emphasis on B♭ is immediately countered by the return of the B-minor triad in m. 45, and in the next few measures, there is a clear return to the familiar territory of the LPR loop around D, as the piano arpeggiates the B-minor triad (#1) against which the cello arpeggiates first a D-minor triad (#5) and then a G-major chord (#4). This G-major chord is in fact a Mm7th chord, including an F♮ (the piano drops its F♯ at this point), which then resolves functionally to a C-major triad in m. 58. Thus, the pitch-classes emphasized within the two most prominent LPR loops—B and D—are eventually subsumed within a dominant-seventh chord on G, and in a sense point forward toward a clear,

functionally articulated harmonic goal, even if not all of the chord-to-chord successions in the passage are functionally coherent. (In retrospect, the significance of the B♭-minor triad that hinted at a shift to an LPR loop about B♭, more likely lay in its inclusion of F, part of the anticipated G7.)

As the foregoing examples suggest, a neo-Riemannian perspective can offer insight into the organization of some triadic passages in neo-tonal works, and specifically can help to illuminate the relationship between foreground harmonic successions and middleground structures—whether these middleground structures project motivic content or anticipate functionally defined harmonic goals. Here we might add a caveat, however: the lack of emphasis on voice-leading parsimony in these examples does perhaps raise questions about the LPR model as a source of coherence—questions not raised as directly in tonal contexts, in which smooth voice leading remains normative. As in tonal contexts, we therefore encourage our students to consider passages such as these from various analytical perspectives. Salzer's extensions of Schenker's ideas (see footnote 13 above), for example, might equally well represent the structures identified here. If so, we would encourage our students to consider what one might convey by choosing one approach over the other. As such, and even though this kind of organization is by no means characteristic of all triadic passages in the neo-tonal repertoire, we find discussion of this approach, in conjunction with carefully chosen examples, useful in getting students to consider alternative approaches to neo-tonal organization.

In the context of a twentieth-century survey course emphasizing model composition, neo-Riemannian theory can also open doors to compositional work in neo-tonal styles. In addition to taking the above analytical examples as models—asking students to compose, for example, a non-functional triadic passage that projects a C-major triad in a way similar to that seen in the Salmenhaara passage—standard neo-Riemannian cycles can be treated as a compositional resource and manipulated to produce new successions. For example, we might take the RL cycle and reverse the mode of each triad, then instead of C-major—A-minor—F-major—we would get C-minor—A-major—F-minor and so on. We have taken the liberty

of recomposing the beginning of the Reger piece along these lines, as shown in Example 15 (note that the first chord is unaltered). The progression sounds somewhat strange, but not altogether foreign to Reger's style.



Example 15

Final Thoughts

The inclusion of neo-Riemannian theory in the undergraduate theory core brings to the fore important questions about the bases of tonal (and post-tonal and neo-tonal) coherence, but, as noted above, the approach's greatest pedagogical advantage lies in its capacity to support bridge building. From a purely pragmatic perspective, introduction of the neo-Riemannian approach not only reinforces and integrates what otherwise might seem to be disparate topics in chromatic harmony, but it also permits students to first encounter a transformational perspective on musical structure in a familiar setting, before confronting notions of pitch-class transformations and equivalencies. Somewhat more ideally, perhaps, we believe that this theoretical bridging encourages students to see continuities not only between tonal and post-tonal music theories, but also between nineteenth- and twentieth-century music.

A final and far from inconsequential benefit accrued from teaching the neo-Riemannian approach relates again to its bridging potential, in this case its potential to bridge the divide between contemporary research in music theory and the version of music theory that we typically teach to our undergraduate students. The frequent disconnect between what professional music theorists do and what we teach is widely recognized, of course, and neo-Riemannian theory's potential as a remedy has been noted elsewhere.[24] We believe that this opportunity to invite our students to enter into and to begin to explore our scholarly world, coupled with the other benefits outlined above, amply repays the investment of a few class periods in the study of neo-Riemannian theory.

[24] Cohn's (1998b) imagined theory curriculum, designed to address this concern, includes a unit devoted to voice leading between triads, taught in reference to the parsimonious LPR transformations and their *Tonnetz* representations. While Cohn's curriculum as a whole would be difficult to implement at most institutions, some of its components, including the neo-Riemannian approach, can be adopted into existing programs with relative ease.

Without specifically pointing to the inclusion of neo-Riemannian theory in this regard, Stephenson (2001) cites Roig-Francolí's efforts to incorporate professional methodologies as a strength of this text (see especially pp. 103 and 111).

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Forks in the Road: Teaching Scarlatti's Sonata in C-Major (K.159, Longo 104)

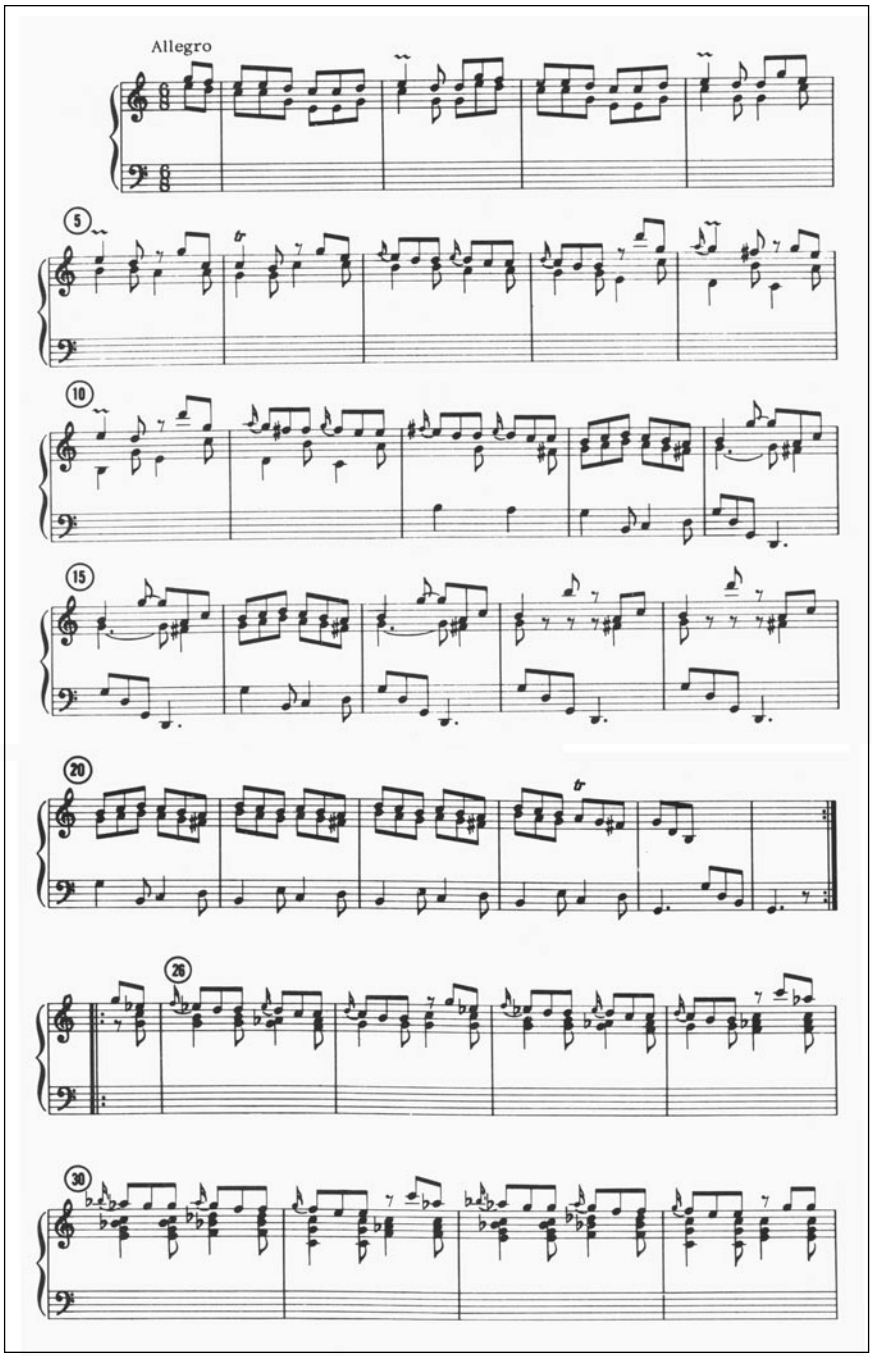
Stephen Slottow

I have twice taught Scarlatti's Sonata in C-Major towards the end of a first-semester Schenker course. This sonata, unusually for Scarlatti, restates the opening material in the tonic at the beginning of the final section.[1] Thus the piece approximates a simple sonata form: an exposition that modulates from tonic to dominant, a development that prolongs the dominant, and a recapitulation that restates the opening theme in the tonic and transposes the following material from dominant to tonic. These terms--exposition, development, and recapitulation--are anachronistic, but I use them partly because students relate easily to them, and partly because they seem to apply well to this particular sonata. The sonata is given in Example 1.[2]

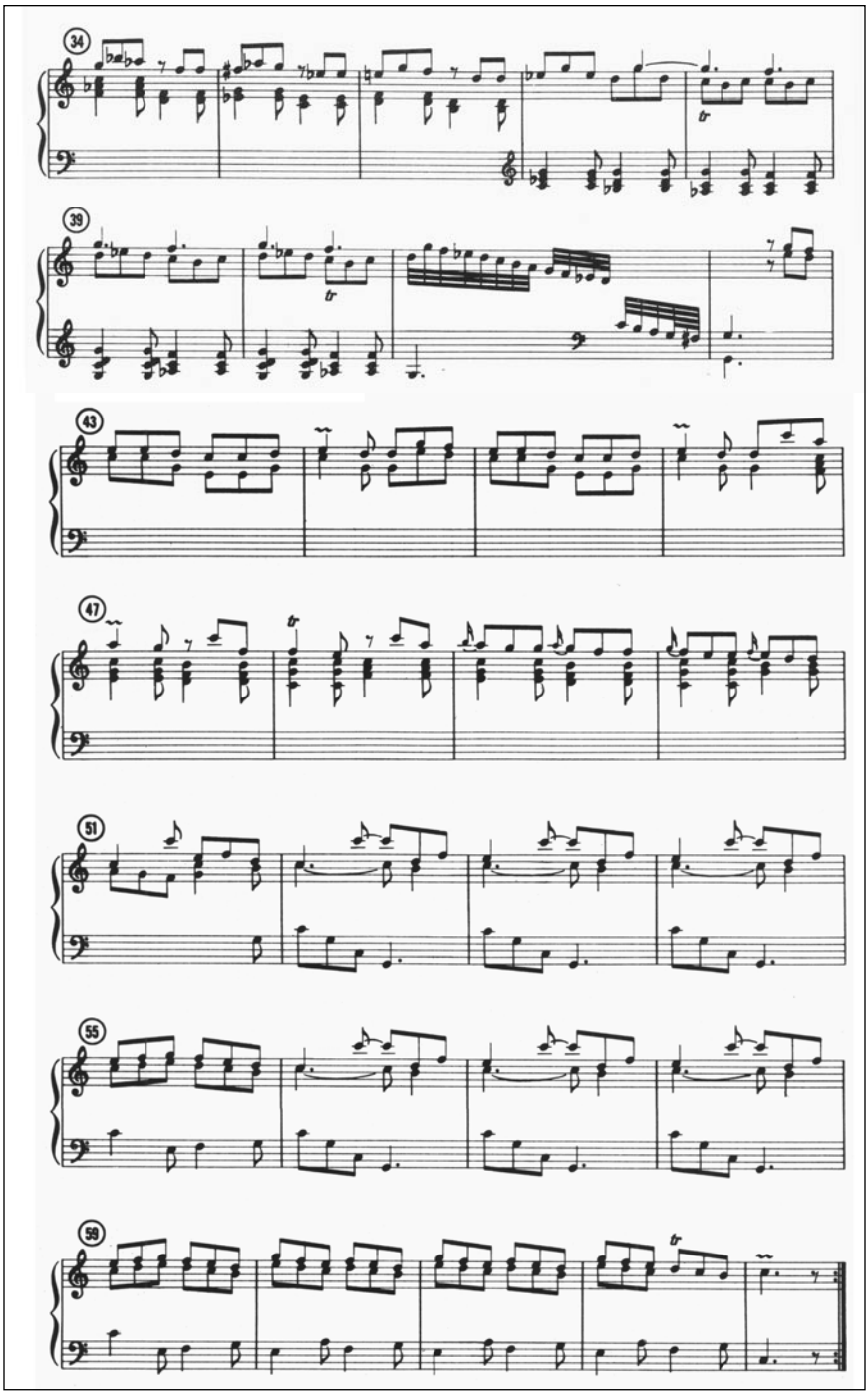
In my experience, the process of teaching this piece, and especially of commenting on student analyses, tends to crystallize around "forks in the road": different readings of crucial places, or, to put it another way, different placement of crucial events. Some of these are valid alternatives; some are illusory but can appear valid to students. Of course, such forks are, to a greater or lesser extent, part of a Schenkerian analysis of any piece, but seem unusually clear in this one, partly perhaps because the harmony is relatively simple and straightforward. I will discuss five such points in this paper, commenting on them analytically and pedagogically. Student readings will be demonstrated by transcriptions of student graphs (slightly condensed to save space) labeled Student A, B, etc. Most of these student graphs contain various infelicities of reading or notation that I don't discuss, in the interests of staying on topic. These have for the most part been preserved without comment.

[1] According to Ralph Kirkpatrick, *Domenico Scarlatti* (Princeton, New Jersey: Princeton University Press, 1953), 266, the only other Scarlatti sonatas to do so are K. 132, 256, and 481.

[2] This edition by Charles Burkhart, based on the 1752 MS "Venice I 12" in the Biblioteca Marciana, Venice, was first published in his *Anthology for Musical Analysis*, 1st ed., Holt, Rinehart & Winston, 1964.



Example 1 - Scarlatti's Sonata in C Major



Example 1 - Scarlatti's Sonata in C Major *(continued)*

The title and, to some extent, the topic of this paper were suggested by Carl Schachter's article "Either/Or,"[3] which discusses how the analyst "must search for clues about which of two or more possible interpretations is the correct one, or about which of two or more 'correct' ones is the truest artistically."[4] This issue comes up even more strongly when teaching analysis, since teachers are typically exposed to a wider range of readings than they would consider on their own and must articulate why some are more appropriate than others. Inevitably questions about ambiguity arise. Students ask why it is necessary to make choices at all--why not include many possible interpretations? Why exclude some in favor of others?

This question, has, of course, been a major topic of analytical writing in recent years, with widely varying views. For instance, Carl Schachter's stance is explicit in "Either/Or," even in the short passage just quoted. Multiple "possible" interpretations may exist, but among these the analyst should search for the "correct" interpretation. Where there is a choice of correct interpretations, the analyst should choose that which is "truest artistically," taking into account features such as motive, the relation between structural and design features, etc.

Kofi Agawu's position is stricter (or more restrictive) than Schachter's.[5] He writes that "a musical situation is ambiguous if and only if its two (or more) meanings are comparably or equally plausible, leaving the listener undecided about their future significance,"[6] and concludes that "the concept of ambiguity is meaningless within the confines of an *explicit* music theory . . . not that multiple meanings do not exist in tonal music (how could they not?) but that, once the enabling constructs of music theory are brought into play, equivocation disappears."[7]

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[3] Carl Schachter, "Either/Or," in *Unfoldings*, ed. Joseph N. Straus (Oxford/New York: Oxford University Press, 1999), 121-33.

[4] Ibid, 122.

[5] Kofi V. Agawu, "Ambiguity in Tonal Music: a Preliminary Study," in *Theory, Analysis and Meaning in Music*, ed. Anthony Pople (Cambridge/New York/Melbourne: Cambridge University Press, 1994), 86-107.

[6] Ibid, 89.

[7] Ibid, 88.

On the other end of the spectrum, Marianne Kielian-Gilbert argues strongly in favor of multiple readings,[8] writing that "not only are multiple readings sometimes--often--possible, they may also be a significant way to render the specificity of a particular reading or the dynamic of a progression over time. Might the sense of an "oscillation," a back-and-forth of different hearings, characterize the relationships of such conflicting and/or multiple harmonic readings over time? Should we be wary of the fact that our theoretical tools often compel us to make 'impossible' unitary decisions, or should we welcome the fact that they force them, impossible as they are?"[9]

My own position, which I try to convey to students, is (perhaps not surprisingly) closest to Schachter's. There may be a number of readings that are conceivably "possible", that is, internally consistent, without contradictions such as a prolonged tonic in the treble against a prolonged dominant in the bass. But many "possible" readings are nonetheless implausible: that is, they are incongruent with the norms of tonal usage (such as misreading an applied dominant as an "endpoint" modulation of its own), or they seem to go against the grain of one's hearing of the piece (such as starting a coda in the middle of a sequence). Among plausible readings, one looks for the reading that best conveys one's deepest intuitions and perceptions about the piece.

Schenkerian analytical technique does not allow multiple interpretations in a single graph--to attempt this (and many students do) is to retreat into vagueness or contradiction. However, one can certainly produce alternative graphs, or change one's mind. It is typical for Schenkerian (perhaps for all) analysts to rethink or revise a passage, often after some time has elapsed, or to revert to a former reading. This perhaps corresponds to Kielian-Gilbert's "oscillation" between "different hearings." But there is a difference. Kielian-Gilbert regards these different readings as conceivably of equal validity--in a sense, coexistent--since unitary decisions are "impossible." As she writes, "it helped to 'hear multiply' rather than to reduce our experience by eliminating or ranking perceptions."[10] But, as one of my teachers told me, Schenkerian analysts usually

[8] Marianne Kielian-Gilbert, "Interpreting Schenkerian Prolongations," *Music Analysis*, 22/1-2 (March-July, 2003): 51-104.

[9] Ibid, 55.

[10] Ibid.

strive for a theoretical, if not necessarily actual, "best" analysis (or at least "personal best"), and alternatives are weighed and evaluated. In this process, the analyst does not strive to "hear multiply" but to hear each reading "singly"--rather like those pictures in which one can see either a vase or two faces, but not both images at the same time--and then to evaluate which interpretation seems to provide the best fit.

The quest for a "best" analysis carries the danger that students may believe that the evaluation of their graphs depends on how close they are to the teacher's graphs. I try to prevent this in two ways. The first is by stating from the outset that "getting the right answer" is not the point. A student's graph will not get a low grade because it's different from mine: what's most important is that it makes sense and is presented clearly. By "makes sense," I mean that it is a possible reading (not internally contradictory), is coherent in terms of the theory, does not misrepresent basic features of the piece (such as reading a recapitulation in the dominant instead of the tonic), and, to some extent at least, recognizes and attempts to account for unique features of the work. There is always a range of readings which satisfy these criteria.

My second strategy for discouraging the idea that I have the right answer and that every other answer is wrong is by encouraging students to turn the class into a pitched battle in which everyone (everyone interested, anyway) presents, debates, compares, defends, and criticizes each other's readings. Once people have worked long and hard at an analysis, they tend to be fairly deeply invested in it and to have developed a sort of passionate territorial interest in the matter. In these often-heated arguments, I function both as moderator and participant, although I usually wait until others give their views before offering my own. But I do eventually comment and give my own opinions--I am no more a disinterested party than are the students. Sometimes I will bring in "outside" analyses for class consideration. In all of this I try to convey the point that deciding which possible readings are most appropriate is a subtle and subjective matter involving the weighing of various design features, examination of precedents, fine-tuning, and repeated playing and listening;[11] it deals more with shades of grey

[11] On the relationship between analysis and auditory perception, see Nicholas Cook, "Music Theory and 'Good Comparison': A Viennese Perspective," *Journal of Music Theory* 33, no. 1 (Spring 1989): 117-41.

than with black and white. One can, and does, change one's mind. I will also say that, in my opinion, an analysis is an interpretation; and that presenting it is less like a scientist reporting reproducible findings than like a lawyer arguing a case before a jury.[12]

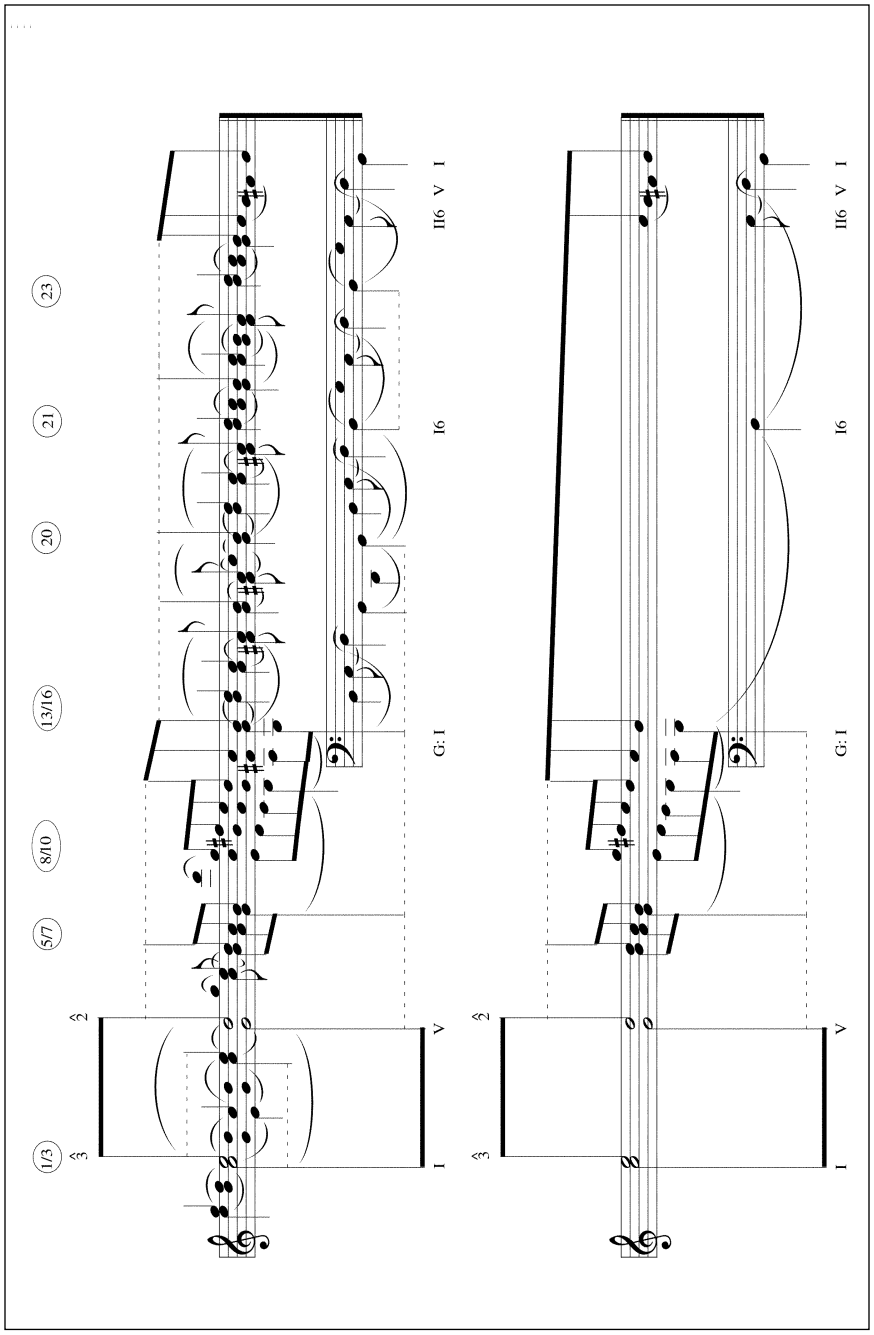
This paper will demonstrate such weighing and evaluation in the C-major Scarlatti sonata. Although the context of my discussion is pedagogical, every analyst, whether novice or "expert," must cope with forks in the road; the difference is of degree rather than of kind. I will discuss the following points, or "forks", in this paper:

> (1a) In the exposition, where is top-line $\hat{2}$ reached?
> (1b) The exposition ends with a subsidiary fifth-descent from top-line $\hat{2}$. Where exactly does this occur?
> (2) In the development, how does one interpret the voice leading in mm. 34-41 and, tangentially, how does it relate to mm. 1-4 and 26-27?
> (3a) In the recapitulation, what is the status of V in mm. 44/46 (corresponding to mm. 2/4 in the exposition)?
> (3b) Where is the structural close of the piece?

Point 1a: In the exposition, where is top-line $\hat{2}$ reached?
Point 1b: Top-line $\hat{2}$ initiates a subsidiary fifth-descent.
Where exactly does this occur?

To begin to answer 1a, it is crucial to arrive at a reading of the opening three verticalities of the sonata, since they exemplify a metric pattern that recurs repeatedly throughout the piece. My students all agreed that the first two eighth-note vertical thirds are pickups that lead to the main note. Thus the main top note is E, not G. The decision is fairly obvious because the passage is all within tonic harmony and E arrives on a strong beat over C, whereas G does not. What is not so obvious is that this reading has far-reaching consequences--it sets an analytical bias for interpreting subsequent instances of this metric pattern as two pickups followed by a stressed main note. This in turn has a direct bearing on point 1a: after the initial move from tonic to dominant harmony in mm. 1-4, the tonic never returns, since every subsequent C-major sonority is

[12] For a contrary view, see Matthew Brown and Douglas Dempster, "The Scientific Image of Music Theory," *Journal of Music Theory* 33, no. 1 (Spring 1989): 65-106, and "Evaluating Musical Analyses and Theories: Five Perspectives," *Journal of Music Theory* 34, no. 2 (Autumn 1990): 247-79.



Example 2 - Slottow, Exposition

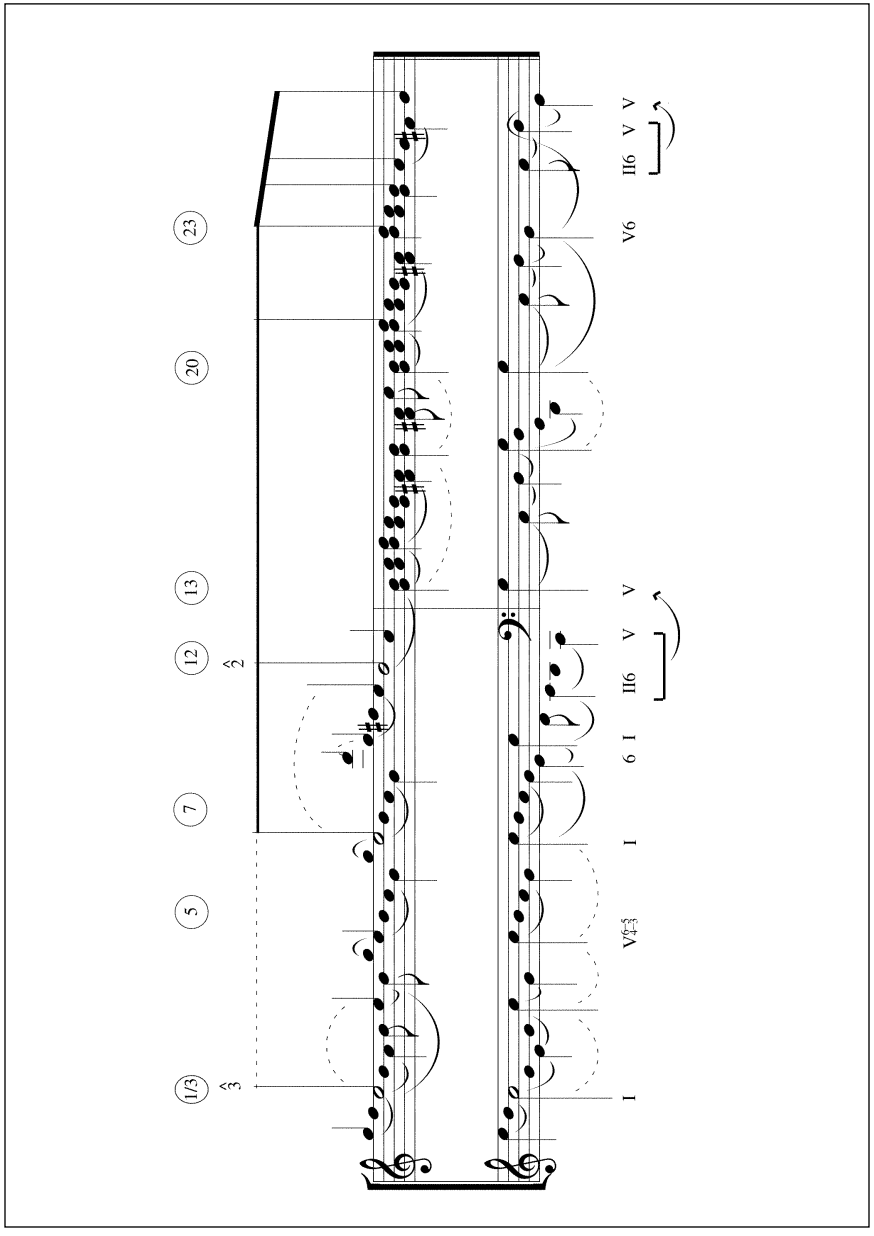
a pickup.[13] Thus a strong case can be made that the structural descent from $\hat{3}$/I to $\hat{2}$/V occurs in the first four measures, and this is where I place it. My reading of the exposition is given in Example 2.

However, many students disagreed with me. This is hardly surprising: such a fleeting tonic prolongation followed by such an early and extended dominant prolongation is unusual. The arrival on V seems premature, and unlike students' ideas of musical norms formed both by their prior listening and their experience in the Schenker course so far. Three and half measures of tonic followed by twenty-one and a half measures of dominant prolongation in the exposition alone (plus seventeen more in the development) create highly unbalanced proportions. But, in my opinion, asymmetrical proportions are an important feature of this particular sonata, and not only in the early arrival of V. As will be discussed later, the excessively short duration of the initial tonic in the exposition is, in a way, compensated for by the excessively long duration of the final tonic in the recapitulation, caused by the early end of the structure in m. 51, followed by an improbably long coda.[14]

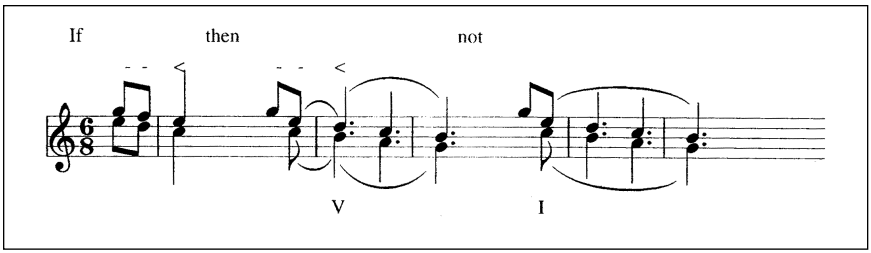
[13] There is one exception: the descending tenths G-F♯-E-D over E-D-C-B from the end of m. 8 through m. 10 (immediately repeated in mm. 10-12). Here Schenker's idea of "leading" and "following" simultaneous linear progressions must be invoked. The "leading" treble line fills in the G-D fourth in the V triad; the "following" lower line counterpoints the upper line at the lower tenth. This passage is treated in Heinrich Schenker, *Free Composition*, trans. and ed. Ernst Oster (New York: Longman, 1979), 78-79 and figure 95/b/2. Schenker's idea is discussed in Carl Schachter, "A Commentary on Schenker's *Free Composition*," in *Unfoldings*, ed. Joseph N. Straus (Oxford/New York: Oxford University Press, 1999), 202-4.

[14] Carl Schachter discusses the possibility of an extremely brief and understated initial structural tonic, citing as an example the Scherzo from Schubert's Piano Sonata in A Minor, D.845 (op. 42), in which the initial tonic lasts only five measures. See "Rhythm and Linear Analysis: A Preliminary Study," in *Unfoldings: Essays in Schenkerian Theory and Analysis* (Oxford/New York: Oxford University Press, 1999): 26-27, 43; originally in *Music Forum* 4 (1976), 281-334.

As mentioned, many students disagreed with me. For instance, in a graph by Student A (see Example 3), top-line E descends to D as late as m. 12, and D is retained until the very end of the exposition, where it quickly descends D-C-B-A-G. For me, the retention of E is



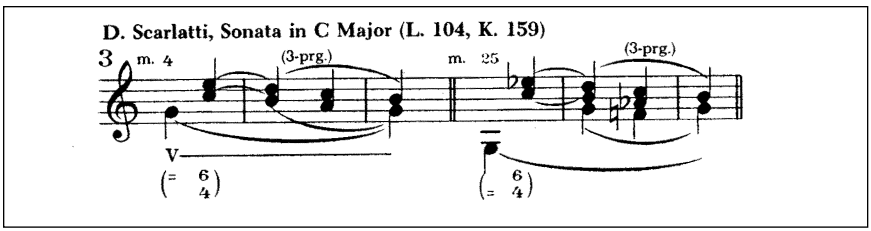
Example 3 - Student A, Exposition



Example 4 - Metric pattern of opening gesture as precedent

problematic. As shown in Example 4, retaining the E for so long is possible only if the harmony after the repeated opening "hunting horn" theme is heard as tonic, not dominant; that is, if the repeated bass line C-B-A-G (doubled a 3rd above) in mm. 4-8 is heard as a fourth-progression prolonging tonic harmony. But this reading contradicts the prior interpretation of the first three dyads of the piece as two upbeats followed by a stressed downbeat. In light of that precedent, C-B-A-G is not a fourth-progression in the tonic, but a pickup followed by a third-progression in the dominant. Moreover, as shown in Example 5, Schenker's reading of the passage from *Free Composition* (with which I agree), the E/C upbeat is really a $\frac{6}{4}$ over retained V. Schenker comments:[15] "Despite the appearance of fourth-progressions, only third-progressions with appoggiaturas are to be read here."[16]

If the dominant is reached in m. 4 and persists for the rest of the exposition (a reading that to me seems inescapable), Student A's retained E is at odds with the harmony. Student A evidently feels that the dominant does not take effect until the arrival of bass G in m. 13.



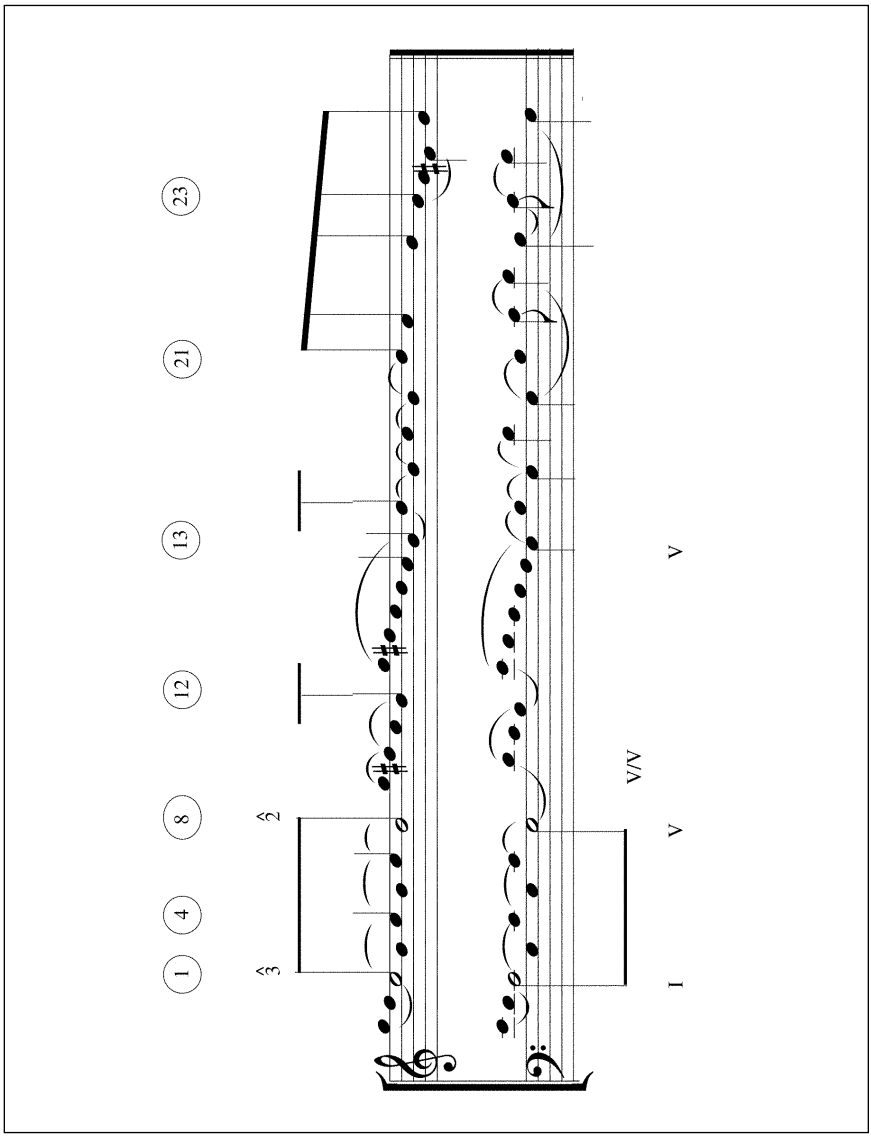
Example 5 - *Free Composition*, Figure 97/3: "Despite the appearance of fourth-progressions, only third-progressions with appoggiaturas are to be read here." (*Free Composition*, 81)

[15] Heinrich Schenker, *Free Composition*, trans. and ed. Ernst Oster (New York: Longman, 1979), figure 97/3.

[16] Ibid., 89.

There are two other aspects to this reading:

(1) Student A is unsure how to read the descending thirds from the end of m. 4 to the beginning of m. 8. Although the passage immediately repeats, the first occurrence is labeled V^{6}_{4}-$\frac{5}{3}$ (somewhat like Schenker's reading), but the second is labeled I.



Example 6 - Student B, Exposition

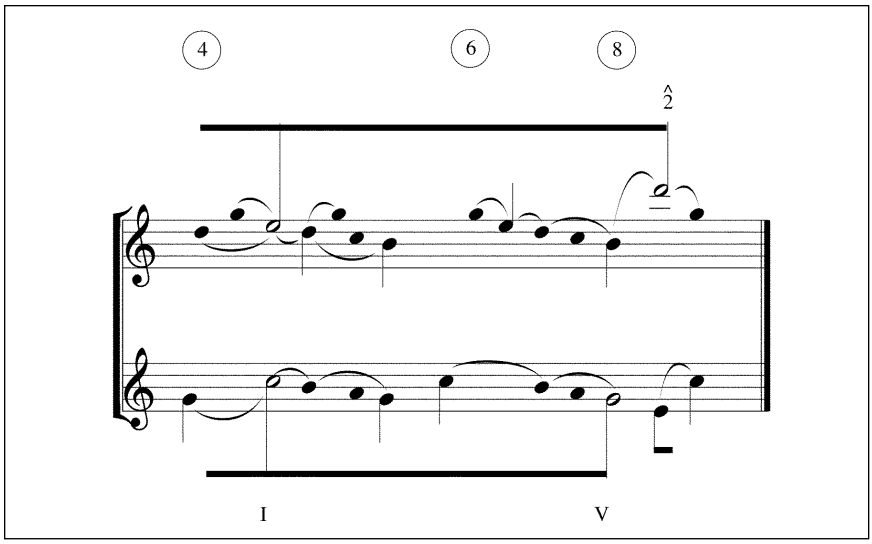
> (2) Student A has probably been taught that tonicization or modulation to the dominant cannot occur before the appearance of an applied dominant chord, such as the VII^6/V in mm. 12-13 (erroneously labeled V/V on the graph). But in this piece the motion to the dominant is understated, and the applied VII^6, followed by a perfect authentic cadence in the dominant (mm. 13-14), only confirms a process that began gradually in m. 4. An analogy can be drawn to a person who walks into a light mist--at first his clothes remain dry but after a little while have imperceptively become quite drenched.[17]

As for the quick D-C-B-A-G fifth-descent at the end: this is certainly quite possible--it often happens--but in this case I feel that there is a better reading more consistent with the nuances of the musical surface. Since B is so strongly stressed in mm. 13-20--the accented first treble note in nine consecutive measures--it is difficult to believe that a descent to B has not yet occurred. Still, since D is regained in m. 21, it is possible--but to my mind, less convincing--to regard B as an inner voice tone under a retained D that quickly descends to G at the very end of the exposition.

Student B presents a somewhat similar reading (see middleground graph in Example 6 on previous page), with treble E as a main note instead of a pickup in mm. 4 and 6, and with D retained until a quick fifth-descent at the end beginning in m. 21, two measures before Student A's reading, which makes the descent somewhat more leisurely. As shown in Example 7 (on next page), Student B's reading of the repeated descending thirds in mm. 4-8 is similar to, but more consistent and nuanced than, Student A's: both are labeled Roman numeral I and shown as fourth-progressions divided into a descending step plus a third, which brings out the V triad; nonetheless, they are still essentially read as fourth-progressions prolonging tonic harmony.

A curious feature of this graph is the identification of Urlinie $\hat{2}$ with the high D in m. 10, a note clear out of the main register. The high D is a superimposed inner-voice note which, although it refers to Urlinie $\hat{2}$, does not initiate it. Later on this student does not give

[17] Frank Samarotto gives many other examples of gradual modulation in "The Drama of the Bridge: Modulation as Process" (Paper presented at the Texas Society of Music Theory meeting, University of North Texas, Denton, TX, February 25, 2006).



Example 7 - Student B, Exposition, mm. 4-8

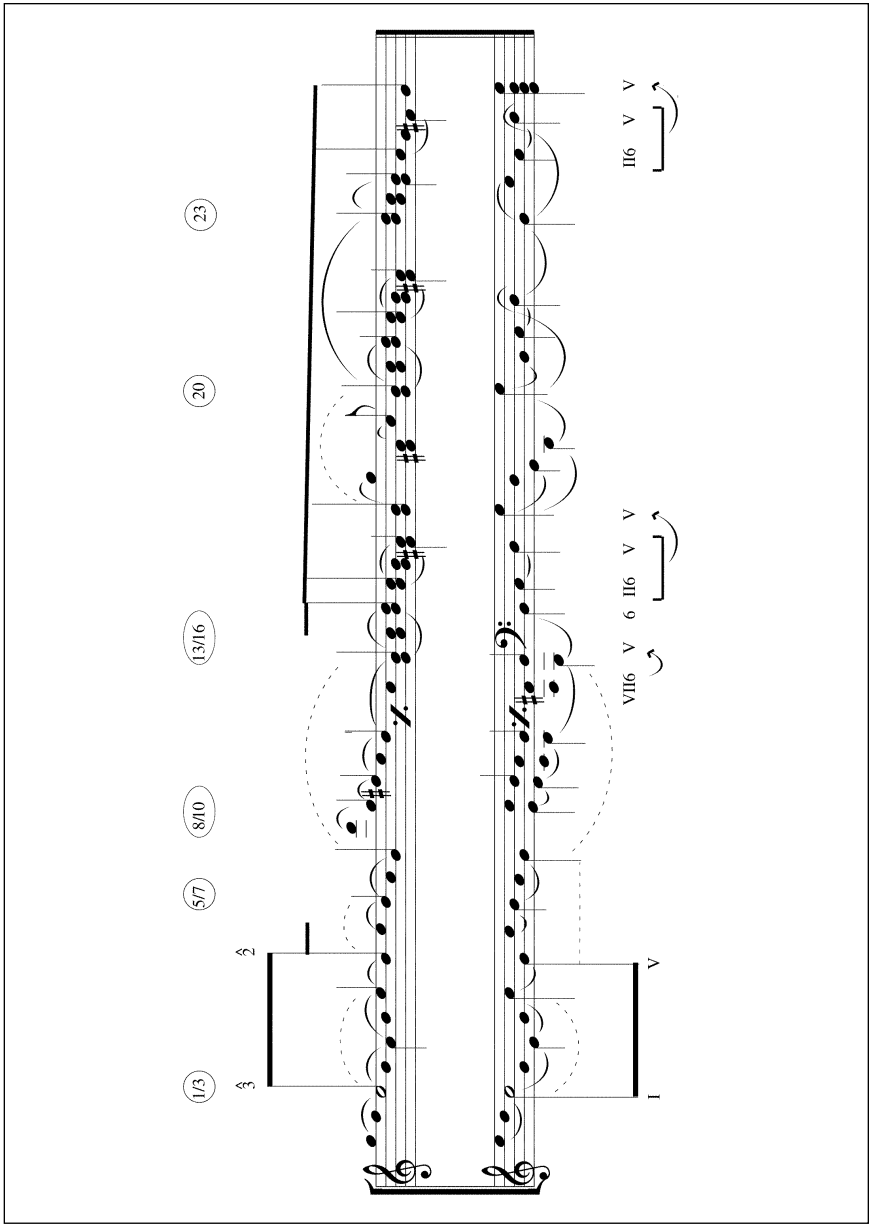
the other high notes (G, B, D in mm. 17-19) any special status--they are notated as simple unstemmed black notes.

Student C presents a reading somewhat like my own, but better (I can't help feeling), or at least more interesting (see Example 8 on next page). Here $\hat{2}$/V is reached at the end of the horn call, and the subsidiary fifth-descent is more gradual than in the previous two students' readings--top-line B arrives with the imperfect authentic cadence in the dominant in m. 14, descending A-G at the end of the exposition. Student B's reading of mm. 4-13 is fascinating, rather like a series of nested boxes. Urlinie D (although not notated as a white note) is retained throughout. Nested between the two D's is a preliminary descent to B, which lasts from mm. 8 to 13. And nested between the two B's are the descending tenths (G/E-F♯/D-E/C-D/C) from the second half of m. 8 to m. 12.[18] It's a very symmetrical, rather elegant, reading.

So, to summarize, Student A misreads the harmony and ignores the strong stress on treble B in mm. 19-21, preferring a quick D-to-G fifth-descent at the very end. Student B's reading is somewhat similar but more nuanced, resulting in a "have-your-cake-and-eat-it-too" reading of mm. 4-8; in addition, Student B misinterprets the high D as an Urlinie note, equating register with structure. Students A's and B's misreading of the harmony results in an unacceptable

[18] In the notation x/y the slash denotes "over" or "above."

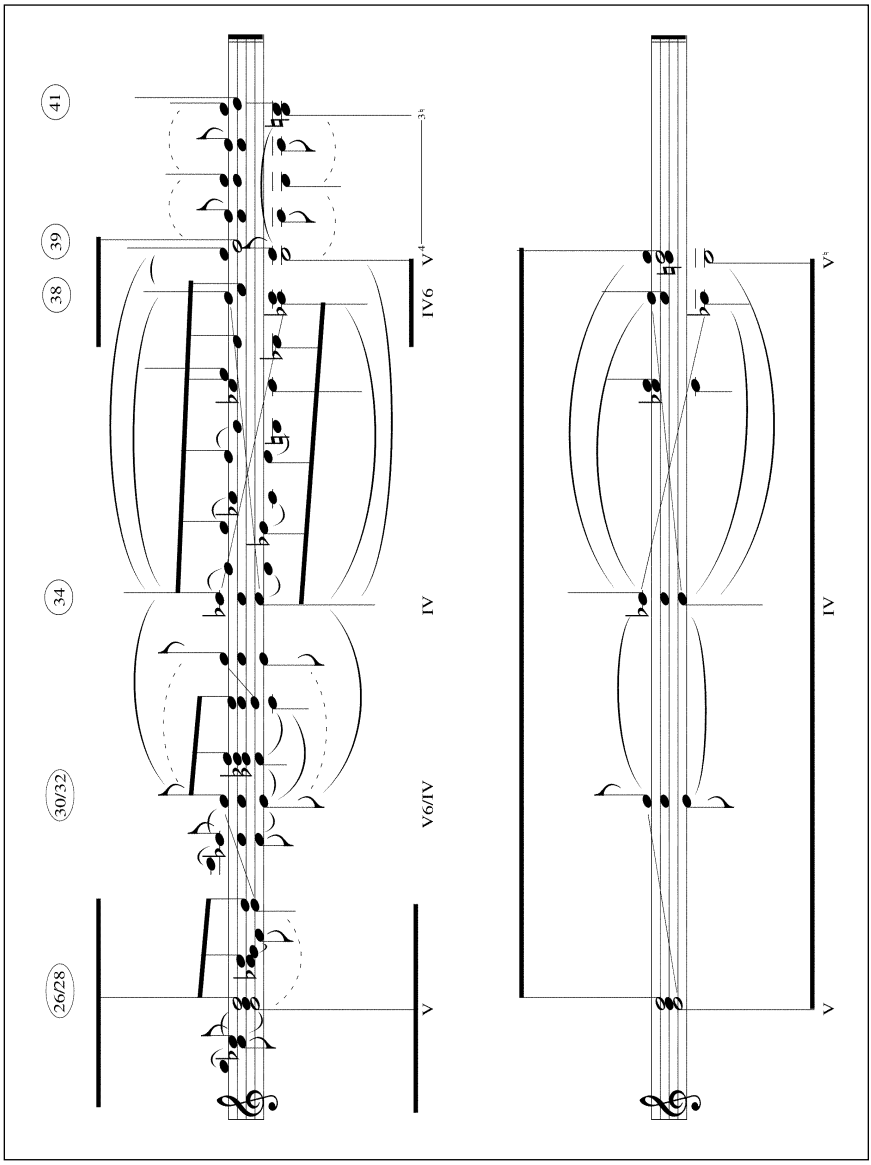
interpretation; taking a quick fifth-descent at the end (Student A and B) is quite possible, but demotes the insistent emphasis on B, and so seems less appropriate. Student C's reading, in my opinion, gives the best "fit" to the music.



Example 8 - Student C, Exposition

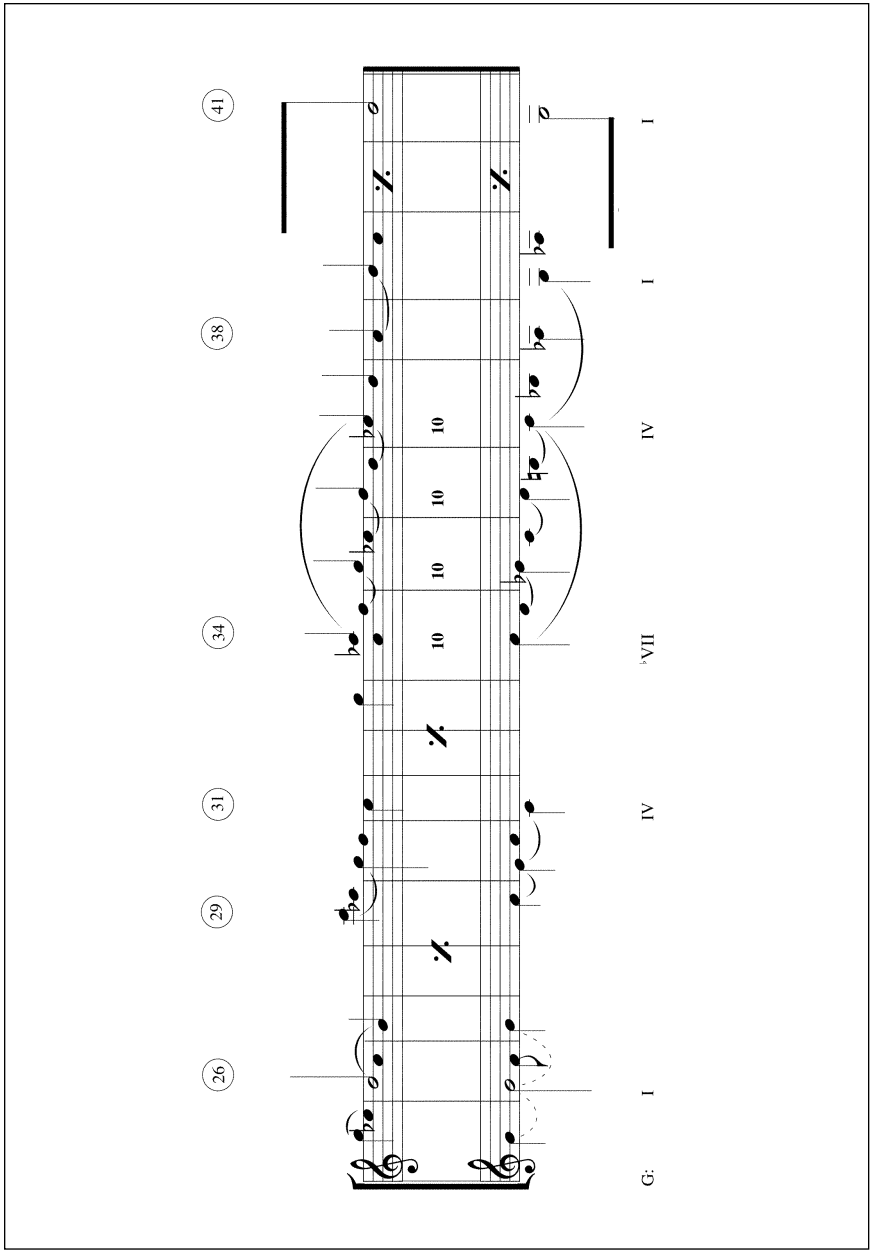
Point (2): In the development, how does one interpret the voice leading in mm. 34-41 and, tangentially, how does it relate to mm. 1-4 and 26-27?

This passage (mm. 34-41) expresses a harmonic motion from F-minor to G, the latter part of the large V-IVm-V progression of the development as a whole (see my graph in Example 9). Almost



Example 9 - Slottow, Development

all of the students recognized the movement from Fm to G but were unclear exactly how F-minor was prolonged. Student D's graph is fairly representative (see Example 10).



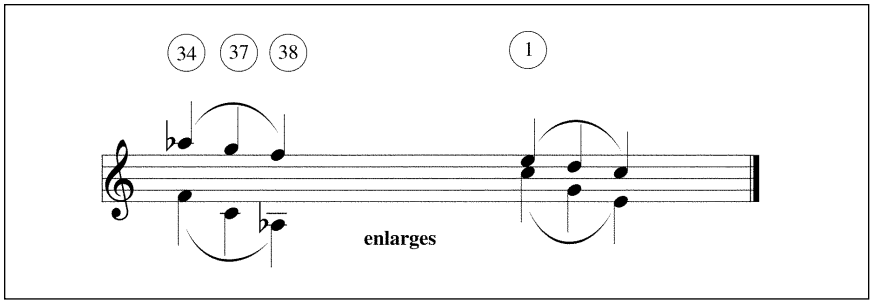
Example 10 - Student D, Development

To begin with (this, however, was *not* representative), Student D treats the entire development as if G-major were the tonic--the student has either forgotten that the development begins on V or has made a strategic decision to treat G as a "temporary" tonic. Either way, the decision is unfortunate, since it obscures the tonal function of the development, and especially of the final V chord. It takes students a while to see that a prolongation of a chord, even one as extensive as this, does not necessarily imply a modulation to the key in which that chord functions as the tonic. Although the exposition definitely modulates to G, after the double bar the change of mode, with its new E♭ and A♭ accidentals, strongly redirects attention to C-minor. G does not behave like a temporary tonic here: there are no V chords and no leading tones (except in m. 41, at the very end of the section). In this discussion I will continue to use C Roman numerals.

Measures 34-41 show a line of descending outer-voice parallel tenths from A♭/F to E♭/C, each followed by weak-beat subsidiary tenths a third below. In m. 37, the subsidiary line disappears and the pace of the descending tenths accelerates, continuing through D/B♭ to C/A♭, at which point the bass A♭ descends to G (V) and the treble C rises to D. Note that Student D slurs from bass C past A♭ to G, implying a fourth-progression from minor I (mislabeled IV) to V (mislabeled I). This reading is OK as far as it goes (except for the last slur and the modulation to G), but it could go further. There are two linked issues--one having to do with segmentation (or prolongational boundaries) and the other with the top voice (here turn back to my graph, Example 9).

The segmentation is incorrect because Student D does not link bass F-C-A♭ into a single F-minor arpeggiation, a prolongation bounded by $\frac{5}{3}$ and $\frac{6}{3}$ F-minor chords, forming a voice exchange. Thus bass A♭ is a boundary, a point to be slurred to, not past. Probably one reason why the student didn't see this is because there is a significant omission in the depiction of the top line. As the parallel tenths descend, a higher and sparser registral line emerges from the treble A♭: A♭-G-F over bass F-C-A♭, forming a large F-A♭ voice exchange. The G/C in the middle also gives the passage a motivic component--it becomes a large-scale replication of the horn motive that begins the sonata (see Example 11 on next page). Ultimately A♭/F in m. 34, after diving into the inner voice to its inversion F/A♭, resolves to G/G in m. 39, and inner-voice C5 (which Student D depicts as a top-line note) proceeds to D5, thereby regaining Urlinie $\hat{2}$/V, here

submerged as an inner voice within the G chord. Meanwhile, in the lower octave, C4 is sustained as a suspension, resolving to an implied B3 two measures later (m. 41).[19] At that moment, Urlinie D, which has been submerged in the V chord under G, emerges forcibly from hiding, highlighted by registral prominence and metric stress, and initiates a rapid flourish of descending notes.



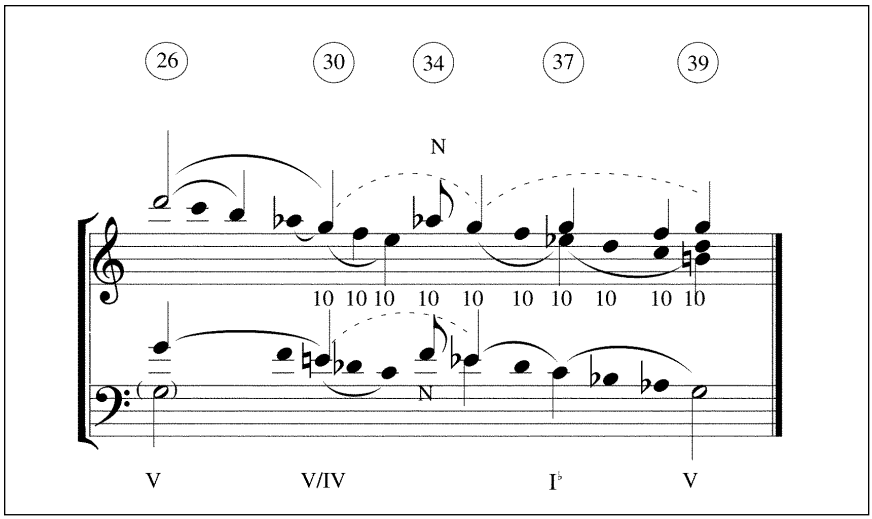
Example 11 - Mm. 34-38 as an motivic enlargement of m. 1

Student D saw much of this: the student shows a resolution to $\hat{2}$/V in m. 39, but withholds Ursatz status, which is reserved for the more definitive arrival in m. 41; nor does the student show the 4-3 suspension.

Now, I don't expect a first-semester Schenker student to see all of this--it is not an easy passage. However, some students did include notes from the higher registral line; one even saw the voice exchange. However, few recognized the F-minor prolongation; I suppose because the F-minor $\frac{6}{3}$ in m. 38 is not felt as an arrival, since it leads right into the G-major chord in m. 39. I think the difficulty was that, since F-minor $\frac{6}{3}$ so clearly wants to resolve to G, students found it hard to consider it as a boundary of an F-minor prolongation in and of itself. They just wanted to go past it to the resolution.

There is some confusion here about the interaction between linear-contrapuntal and harmonic events--a lack of coordination. The prolonged F-minor has its own time span, and the descending tenths take place within and articulate that time span. The voice exchange in particular delineates the boundaries of the F-minor prolongation very clearly. In addition, Student D's "G" Roman

[19] An alternative reading extends the F minor prolongation and voice exchange through the end of m. 40, definitely resolving to G major (now without the 4-3 suspension) in m. 41.



Example 12 - Student E, Development

numerals considerably confuse the issue; otherwise the student might have recognized the fairly standard IV-I-IV^6 expansion of the subdominant, which then resolves to V, instead of struggling with a decidedly nonstandard ♭VII-IV-♭VII^6 chord progression, resolving to I.

Student E's (middleground) graph, shown in Example 12, is quite unusual, not to say audacious, in that there is no F-minor prolongation at all. Instead, the entire development is read as a large plagal-like V-Im-V progression. The F-minor $\frac{5}{3}$ chord in m. 34 is shown not as a goal but as an upper neighbor to a prolonged C^6 sonority, which changes quality from major before ("V/IV") to minor after. C-minor^6 connects to C-minor $\frac{5}{3}$ in m. 37, and the F-minor $\frac{6}{3}$ chord in m. 38 becomes merely one of a chain of descending tenths leading to V.

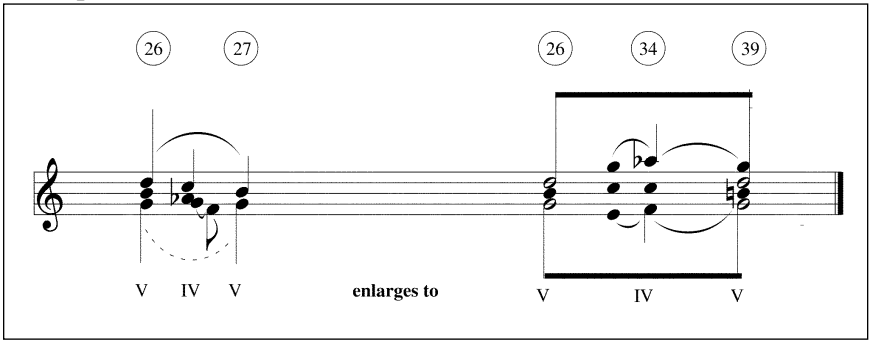
The initial treble D-C-B♮ descent in mm. 26-29 is raised an octave in the graph to more clearly show the student's conception of a descending fifth progression (D-C-B-A♭-G) with treble G as its goal, which is then prolonged for the remainder of the development.

An odd component of this reading is that C-major $\frac{6}{3}$ chord, labeled as V/IV, never resolves to IV at all, even though the root-position F-minor chord in m. 34 would certainly appear to be its resolution. Rather, it is tied to the C-minor $\frac{6}{3}$ chord in m. 37, the chord *after* the F-minor chord.

Student E's work is a good example of a phenomenon with which any teacher will be familiar: a reading that, while quite novel, is nonetheless strangely lopsided. The student draws out a very different pattern--this is interesting and even exciting--but the pattern doesn't quite hold together, doesn't quite add up. The graph has several good points--it shows the upper G-F-G line in mm. 37-39 (missing in Student D's graph), scrupulously marks the motivic outer-voice parallel tenths, correctly reads the arrival at the final dominant in m. 39, and is generally rather meticulous and detailed. The problem is (as usual) the segmentation. There are several difficulties with reading a prolongation of C instead of F-minor, all of them centering on the arrival of the F-minor $\frac{6}{3}$ chord in m. 34:

> (1) Since the F-minor chord does actually resolve the preceding V/IV (and is metrically accented in the bargain), it is quite awkward for the C-major $\frac{6}{3}$ applied dominant to skip past its resolution and modally transform into a minor $\frac{6}{3}$ chord. I think I can follow the student's reasoning: the G/E♮ tenths in mm. 30 (repeated in m. 32) are so similar to the G/E♭ tenth in m. 35, why not connect them and invoke modal mixture to explain the chromaticism?
>
> (2) The arrival on the F-minor A♭/F tenth coincides with a clear change of design--it initiates a sequence. A sequence imposes its own segmentation, tending to be heard as a single unified process with its own territory. If the boundaries are violated, the sequence loses its sense. It seems rather a stretch to yank the G/E♭ tenth out of the sequence and give it a higher structural rank than the preceding initiating A♭/F, connecting it back to the G/E♮ tenth which precedes the start of the sequence.

Incidentally, I never leave this section without mentioning another motivic parallelism--the fact that the chord progression at the beginning of the development (mm. 26-27)--V-IVm-V (which I think owes something to flamenco chord progressions)--is replicated in the harmonic scheme of the entire development (see Example 13.)

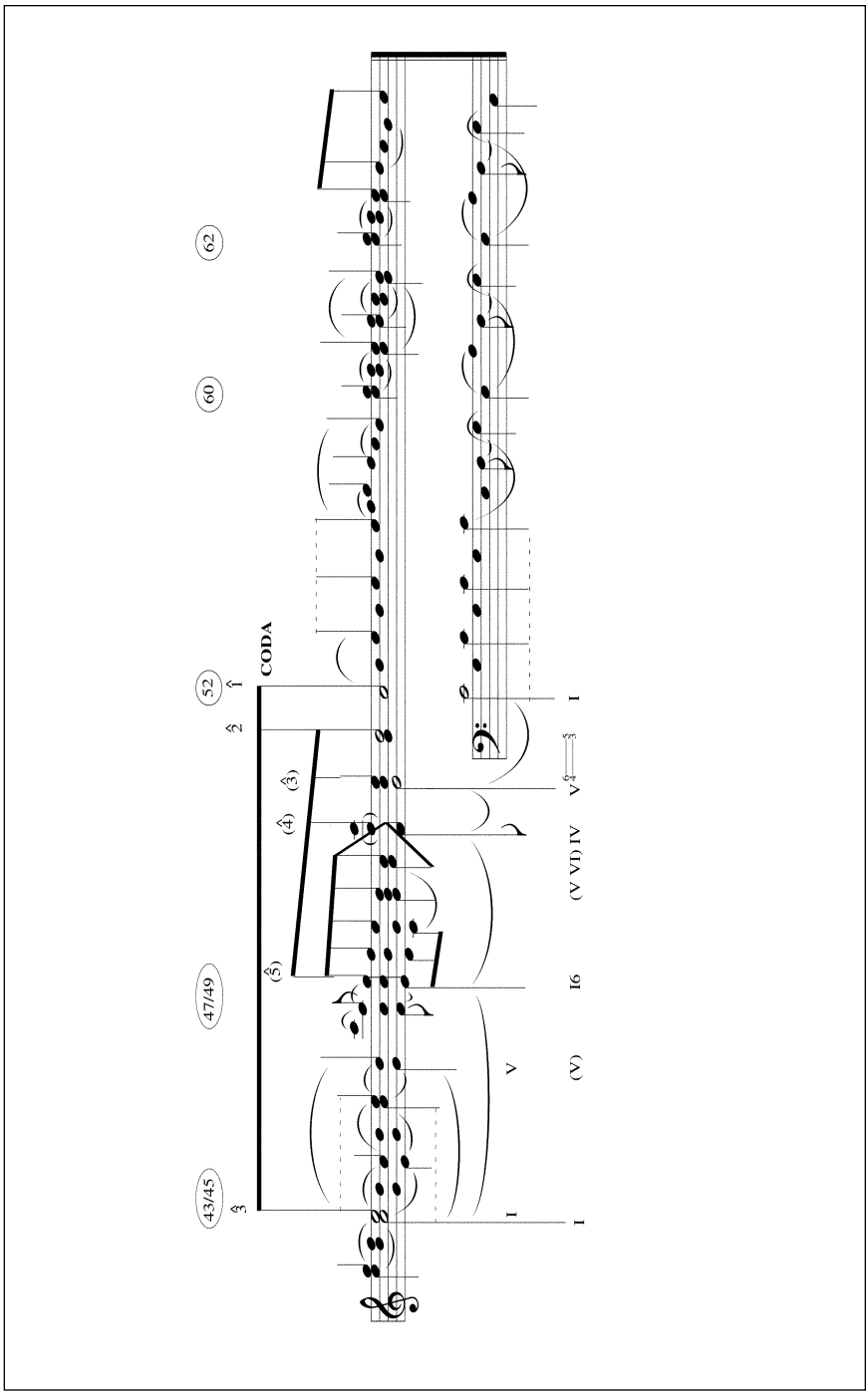


Example 13 - The development as an motivic enlargement of its first two measures

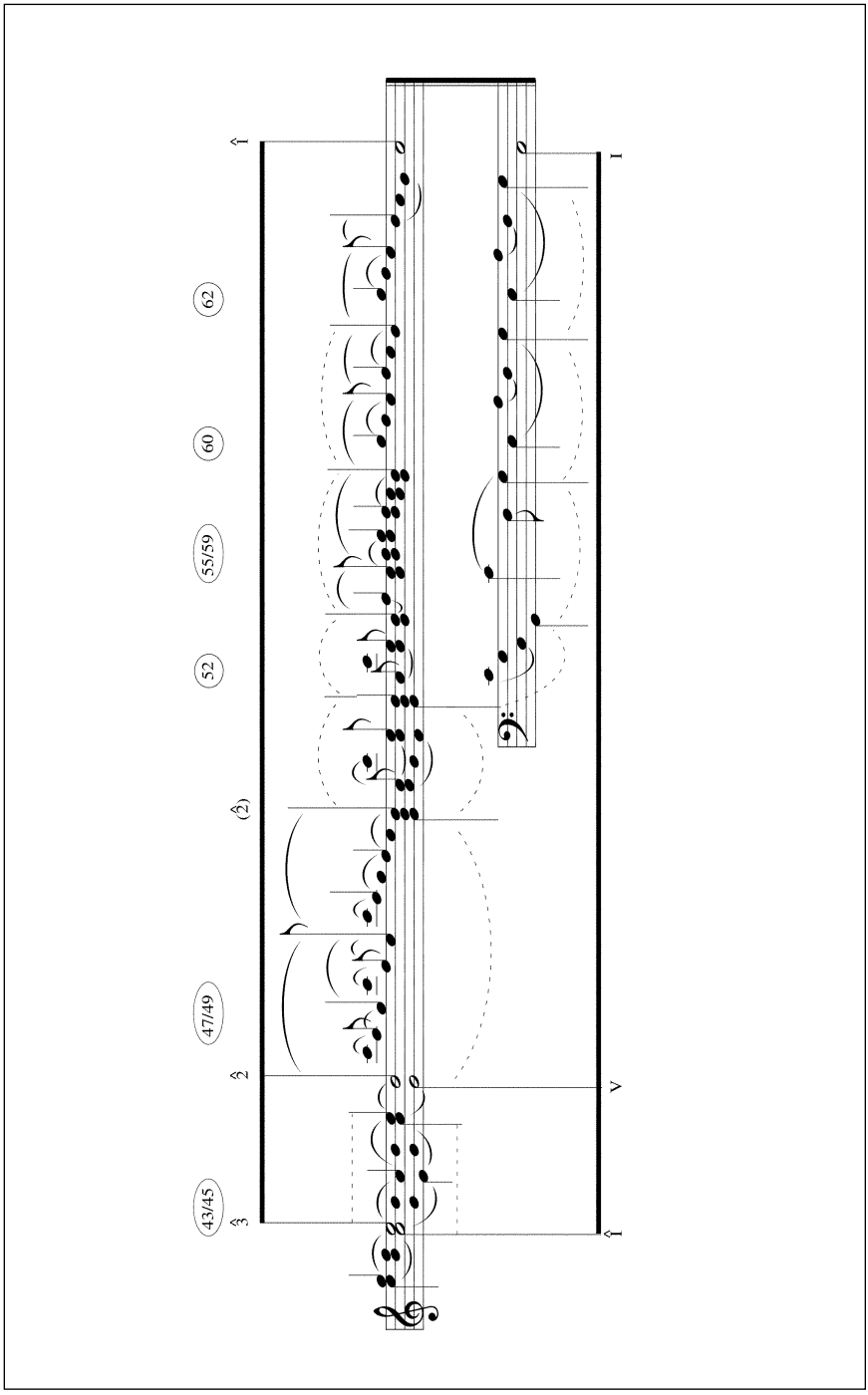
Point 3a: In the recapitulation, what is the status of V in m. 45/47 (corresponding to mm. 2/4 in the exposition)?
Point 3b: Where is the structural close of the piece?

The development ends with an interruption, and Urlinie $\hat{3}$ returns at the beginning of the recapitulation. At what point does it descend to $\hat{2}$? I read the structural close ($\hat{2}$-$\hat{1}$) in m. 52, and (as mentioned earlier) the rest of the piece essentially as coda--that is, necessary for balanced proportions and thematic repetition, but functioning tonally to confirm and nail down the arrival on $\hat{1}$/I. My main reason for this reading is that, whereas in the exposition (mm. 13-14 and again in mm. 16-17) $\hat{2}$ resolves to $\hat{3}$ (in G) in an imperfect authentic cadence, in the corresponding passage in the recapitulation (mm. 51-52 and 55-56), $\hat{2}$ resolves to $\hat{1}$ (in C) in a perfect authentic cadence. See my graph in Example 14 (see next page).

Because earlier, while working on the exposition, I had presented my view that Urlinie $\hat{3}$ descended to $\hat{2}$ at the end of the horn theme, a number of students took the descent at the identical place in the recapitulation, with more or less disastrous results. They forgot that, whereas the exposition begins in the tonic and modulates to



Example 14 - Slottow, Recapitulation



Example 15 - Student E, Recapitulation

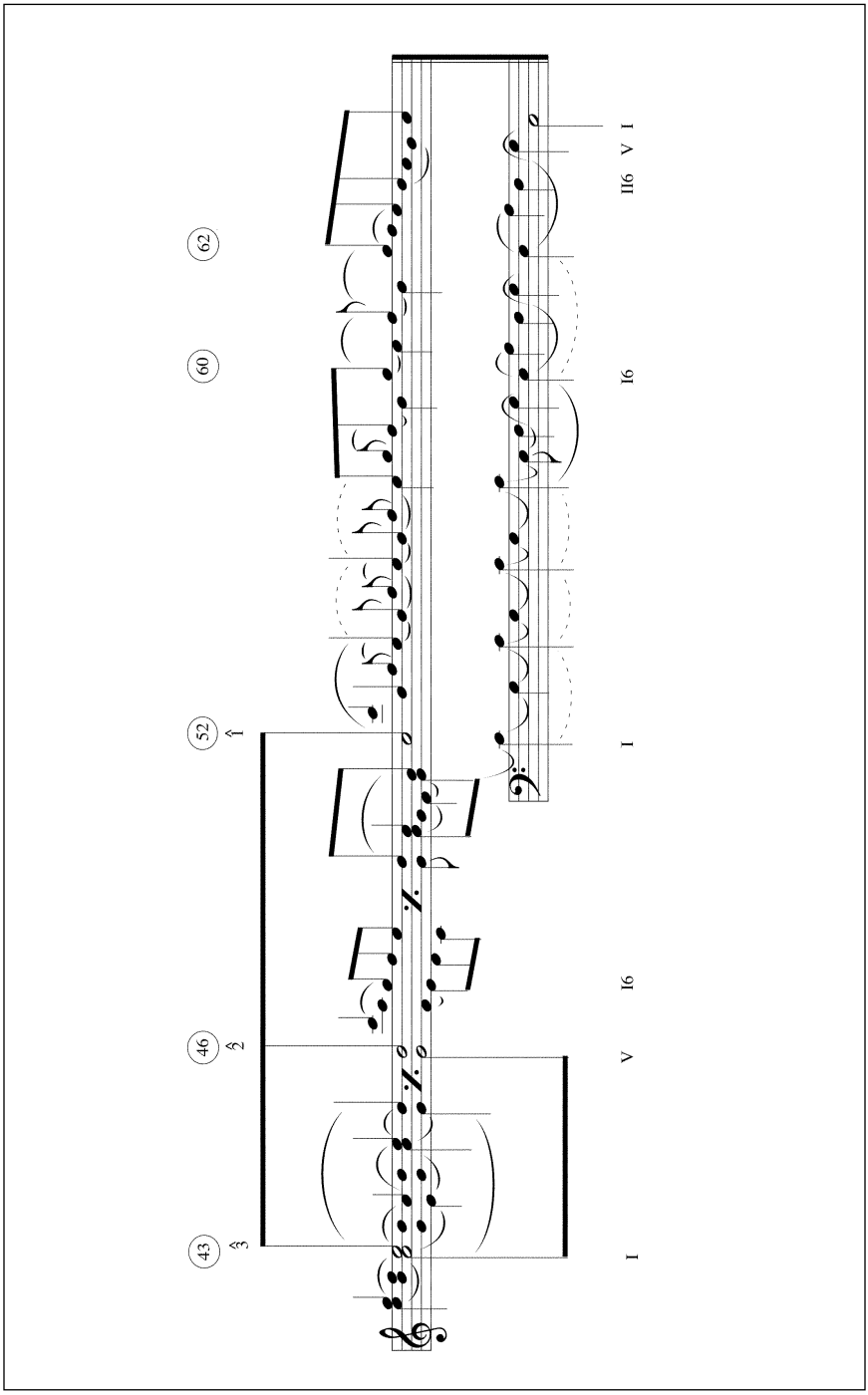
the dominant, the recapitulation is basically all in the tonic. This is clearly indicated by the fact that the exposition material beginning with the upbeat to m. 5 transposes up a fourth at the cognate location at the upbeat to m. 47.[20] So if the end of the horn theme is read as a move to top-line $\hat{2}$/V it m. 4, it can't be read the same way in m. 47 without warping the tonal scheme of the sonata.

The most extreme case of this fundamental misunderstanding was Student E's graph (Example 15 on previous page), which not only moves to top-line $\hat{2}$/V at the end of the horn theme, but prolongs it through virtually the rest of the piece, only descending to $\hat{1}$/I in the last measure. To do this the student must misread the deceptive cadence in A-minor in m. 51, the perfect authentic cadences in C-major in m. 52 and 56, the multiple I-V-I's in C-major, and the extended cadence on C-major in the last four measures. In short, Student E must read as dominant prolongation an entire section whose sole harmonic function is to affirm the tonic. The graph is disorienting, yet perversely fascinating--rather like the Black Mass or Alice's Looking-Glass world--virtually a negative image of the actual situation. It is an instance of how a mistaken theoretical notion can obliterate what is perfectly apparent to the ear.

None of the other student graphs were as profoundly shocking as this one, but many fell into the same trap, if to a somewhat lesser extent. Student F (see Example 16 on next page) takes the descent to topline $\hat{2}$/V at the end of the horn theme (m. 46), but prolongs it until top-line $\hat{1}$ (although, oddly enough, not large bass I) is reached at the first perfect authentic cadence in m. 52. The placement of top-line $\hat{2}$/V is incorrect, but the damage is more limited than in Student E's graph, since it descends to $\hat{1}$ shortly thereafter. Student F's nonalignment of treble $\hat{1}$ and bass I is interesting, and although theoretically not quite right, is nonetheless a rather sensitive reading, a compromise between a sense that top-line $\hat{1}$ is decisively reached in m. 52, and the fact that the piece is not yet over--there is still unfinished business to be got through.

Many students, however, did not read a descent to Urlinie $\hat{2}$ in m. 51 (as I do), nor, for that matter, in m. 46 (as Student F does). One student saw the structure as continuing for the rest of the piece, reading Urlinie $\hat{2}$-$\hat{1}$ (over II^6-V-I) in the last two measures--not my own reading, but certainly a valid alternative.

[20] This passage recasts, in C-major, the earlier C-minor passage from the development (upbeat to m. 30 to m. 33).



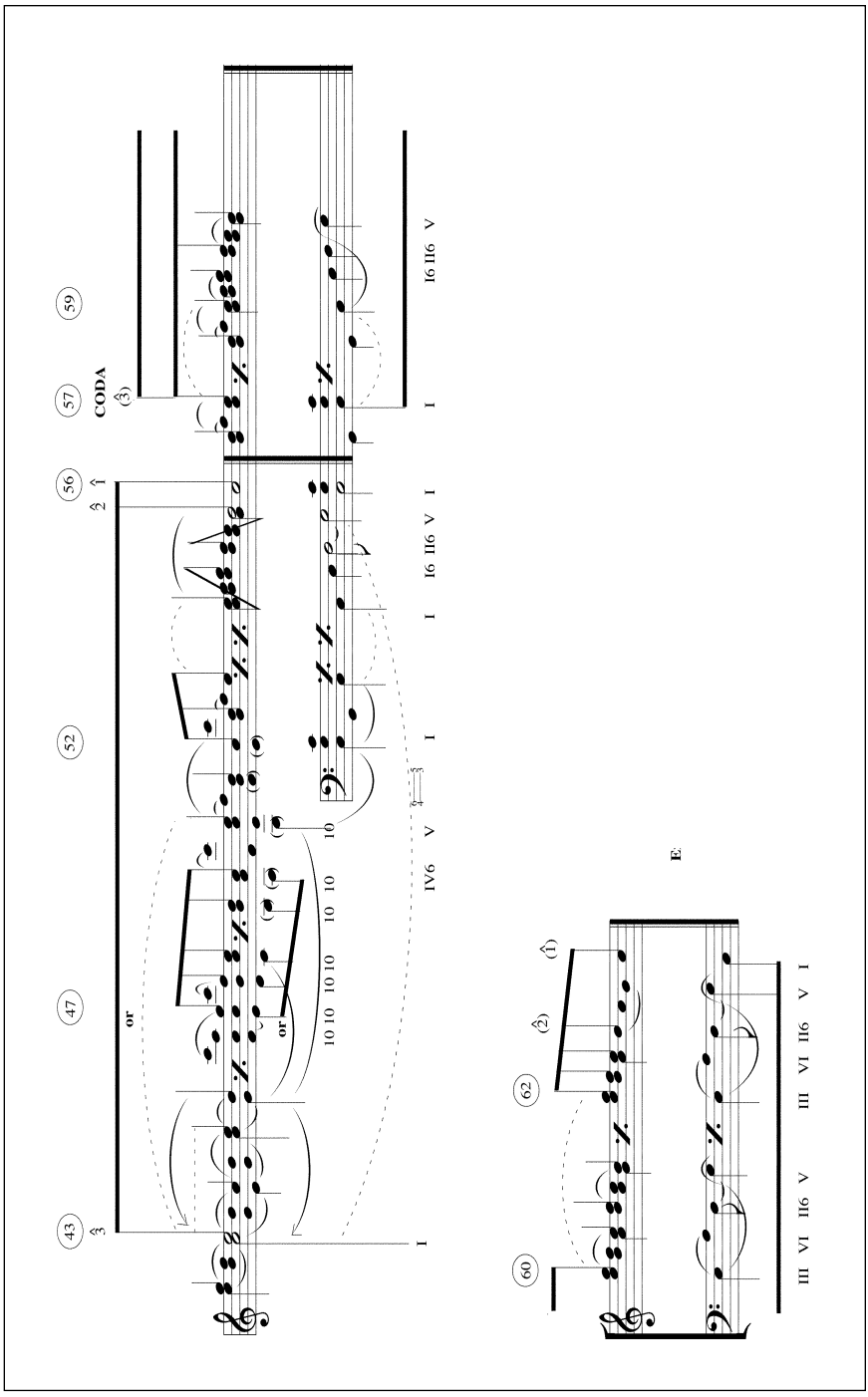
Example 16 - Student F, Recapitulation

Student G ended the structure in mm. 56 (see Example 17 on next page). I can follow the student's reasoning, but it is a doubtful reading. The student decided that the piece had a coda, saw that the penultimate perfect authentic cadence was in mm. 55-56, and so ended the structure there. What the student did not see was that the cadence in m. 56 is elided, beginning an exact repetition of the previous four-bar phrase (in a movement with many other immediately repeated phrases). Adjacent repetitions are usually heard as grouped together--the repetitions reduce to a single event. It is awkward, and somewhat arbitrary, to snatch mm. 55-56 out of the middle of this grouping and confer structural status on it.

The location of the structural close in this sonata is not obvious. It is most unusual for what might be termed the second-theme material to be placed *after* the arrival on structural Î/I, resulting in a coda of immense proportions, considering the brevity of the piece as a whole. As discussed earlier, this outsize coda provides a sort of compensation for the exceedingly short duration of the initial tonic at the beginning of the piece.

Students have trouble accepting the validity of this apparently eccentric reading partly because it is atypical, and runs counter to their preconceptions and previous experience. Then why work on the sonata at all? I think that a virtue of working on such a piece is that it offers a vivid lesson that the Schenkerian enterprise does not consist merely of squeezing hapless musical works, kicking and screaming, into rigid preconceived molds (often an early accusation of Schenker I students). Rather, it involves studying the individual features of a piece as a concrete and unique manifestation of more basic underlying norms of common-practice voice leading and tonality, as formulated in Schenkerian theory and analytical practice: "always the same, but not in the same way."[21]

[21] A translation of Schenker's motto *semper idem sed non eodem modo*, from, among other places, Schenker, *Free Composition*, trans. and ed. Ernst Oster (New York: Longman, 1979), title page.



Example 17 - Student G, Recapitulation

In this paper I have looked at student readings of various events, various forks in the road, in Scarlatti's C-major sonata: in the exposition, the descent to top-line $\hat{2}$ and its subsidiary fifth-descent; in the development, the F-minor prolongation; and in the recapitulation the descent to top-line $\hat{2}$ and the location of the structural close. I have commented on the readings in much the same way as I do in class. What has been the point of all this? The point, I suppose, is that it is important to get students to steer a middle course between a sort of aimless relativism (all readings are equally good) and an inflexible exclusivity (only my reading, or the teacher's reading, is good). Certain things are logically contradictory or simply completely off the wall (such as reading the recapitulation as dominant prolongation), but even among plausible readings, not all possibilities are equally good, and not even all good possibilities are equally good. Considering alternate readings in the classroom demonstrates a range from optimally acceptable (and this may include more than one possibility), to possible but musically awkward, to just plain impossible.

Beyond Chord-Scale Theory: Realizing a Species Approach to Jazz Improvisation

KEITH SALLEY

Collegiate instruction in jazz improvisation is typically given in two places: the jazz theory classroom and private lessons. In both contexts, one of the first concepts taught is the relationship between chord and scale.[1] I distinguish the term "scale" in the classical sense fromthe term "chord scale." The former refers to a stepwise collection of pitches that expresses a tonal center. The latter refers to a stepwise collection of pitches that melodically expresses a chord. A harmonic progression such as I→ii→V7→I contains all of the pitches in a major scale, and the progression could easily support a melody that expresses all of the pitches of that scale. Classical theory holds that one scale accounts for the harmonic and melodic organization of the whole progression. By contrast, jazz pedagogy recognizes a succession of "chord scales," one for each chord. Chord-scale theory teaches students to make harmonically informed melodic improvisations by enforcing one-to-one relationships between chords and scales.

Chord-scale theory is the cornerstone of instruction in jazz improvisation. It begins by associating seventh chords, such as the ii7 and V7, with corresponding diatonic modes (in this case, Dorian and Mixolydian). When improvising over progressions of diatonic seventh chords, students are advised to use the appropriate chord scales, switching them as the chords change. After students became proficient at this, they learn to apply altered and non-diatonic scales to altered and non-diatonic harmonies. At every level of skill the approach is the same: students must change scales—thereby changing their melodic orientations—along with the changing chords.

My use of the term "chord-scale theory" might imply that there is a definitive approach to teaching jazz improvisation, or that chord-scale theory is clearly and indisputably defined in some work by a single author. In truth, there are many different works on the subject

[1] In this article, the terms "scale" and "chord scale' refer to both scales and modes.

by authors from different generations.[2] My criticisms of chord-scale theory pertain to its limitations as a conceptual approach for teaching improvisation. These criticisms address the pedagogy on a very general level, and are broad enough to apply to all works on the subject.

This article should be helpful to any instructor of jazz theory who has noticed the surprising number of students who understand chord-scale relationships perfectly well but still cannot begin to improvise the types of lines that occur in bebop performances. I believe there is a disconnect between the prevailing theory of improvisation pedagogy and the practice of jazz performance. It is a disconnect that becomes evident once a student has memorized a number of chord scales but cannot connect one to another in real time. Barry Velleman's "Speaking of Jazz: Teaching Jazz Improvisation through Linguistic Methods" describes the problem succinctly: "current materials for teaching jazz improvisation rarely succeed at bridging the gap between executing learned patterns and creating spontaneous variations."[3] Bridging Velleman's gap requires knowledge of chord *connections*, and proficiency in this area does not come directly from studying chord-scale theory.

Part one of this article discusses two ways in which this teaching approach fails to prepare musicians for jazz improvisation. The first involves the discrepancy between the upper extensions of 9th, 11th, and 13th chords and the melodic pitches that soloists use to improvise

[2] For a representative sampling, see David Baker, *How to Play Bebop,* vol. 1, and *The Bebop Scales and Other Scales in Common Use* (Bloomington, IN: Frangipani Press, 1985), and *Jazz Improvisation: A Comprehensive Method for All Musicians*, Revised ed. (Van Nuys, CA: Alfred Publishing, 1988); Jerry Coker, *Jerry Coker's Complete Method for Improvisation: For All Instruments*, rev. ed. (Miami, FL: Warner Bros. Publications, 1997); Dan Hearle, *The Jazz Language* (Miami, FL: Warner Bros. Publications, 1980); Richard Lawn and Jeff Hellmer, *Jazz Theory and Practice,* 2nd ed. (Van Nuys, CA: Alfred Publishing, 1996); Mark Levine, *The Jazz Theory Book* (Petaluma, CA: Sher Music Co., 1996); John Mehegan, *Jazz Improvisation 1: Tonal and Rhythmic Principles* (New York: Watson-Guptill Publications, Inc., 1959); Scott D. Reeves, *Creative Jazz Improvisation*, 4th ed. (New Jersey: Prentice Hall, 2006) and *Creative Beginnings: An Introduction to Jazz Improvisation* (New Jersey: Prentice Hall, 1997); and George Allan Russell, *The Lydian-Chromatic Concept of Tonal Organization for Improvisation, All Instruments* (New York: Concept Publishing Corp., 1959).

[3] Barry Velleman, "Speaking of Jazz: Teaching Jazz Improvisation through Linguistic Methods," *Music Educators Journal* 65 (1978): 28-31.

upon them. The second involves the failure of chord-scale theory to distinguish between a melody whose pitch content relates to the *sounding* chord, and one whose pitches relate to a chord that is *about* to sound. I provide some analyses that illustrate relationships between jazz melody and jazz harmony that should enable jazz theory students to create more idiomatic bebop melodies.

The second part of this article goes beyond chord-scale theory and offers a pedagogy for jazz improvisation in six species, informed by the analyses in part one. It draws from several conceptual approaches to jazz analysis and pedagogy including guide-tone lines, Shelly Berg's "goal-note Method," and criteria gleaned from Richard Hermann's "Charlie Parker's Solo on Ornithology: Facets of Counterpoint, Analysis, and Pedagogy," offering an alternative methodology that addresses deficiencies of chord-scale theory.[4] My method focuses on chord connections by gradually introducing rules for melodic motion over typical bebop harmonic progressions as rhythmic and melodic textures become more complex. The progression of species helps students to understand how the essential tones of sounding harmonies relate to those of approaching harmonies. It also helps them to see how less essential tones may be used in embellishing contexts.

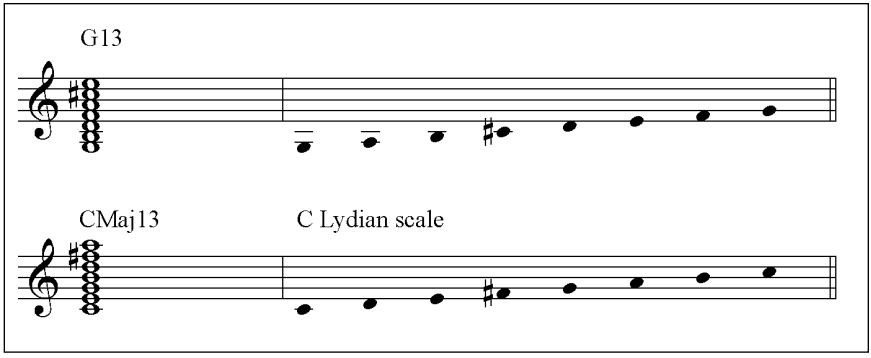
Part I

Chord-scale theories often mislead students into thinking that there is a chord for every scale and a scale for every chord, or what is worse, that at some level of abstraction, it is practical to regard a fully extended chord (root through 13th) and a scale as the same thing.[5] Such theories often graft Mixolydian and Ionian modes onto V chords and I chords, respectively. But chords with major thirds usually take augmented 11^{ths} as extensions, as $P11^{ths}$ create unpleasant dissonances against major thirds. Example 1 shows how the generally accepted arrays of extensions for dominant seventh and major seventh chords actually correspond to the Lydian

[4] Shelly Berg, Jazz improvisation: *The Goal-Note Method: A Comprehensive, Programmed Guide to Jazz Theory and Improvisation*, 2nd ed. (New York: Kendor Publishing, 1998); Richard Hermann, "Charlie Parker's Solo to 'Ornithology': Facets of Counterpoint, Analysis, and Pedagogy," *Perspectives of New Music* 42, no. 2 (2004): 222-262.

[5] See, for example, Levine, *Jazz Theory*, 33.

dominant and Lydian modes, respectively.[6] However, Ionian and Mixolydian remain acceptable options for soloists, as their P11^{ths} can resolve over the course of a melodic line without conflicting with the voice-leading function of any structural chord tones. The tertian structures of chords naturally restrict upper extensions, but jazz improvisors exercise considerable latitude in the melodic expression of underlying harmonies. Such license is analogous to the melodic insertion of non-chord tones in traditional harmony.



Example 1 - G Lydian Dominant scale.

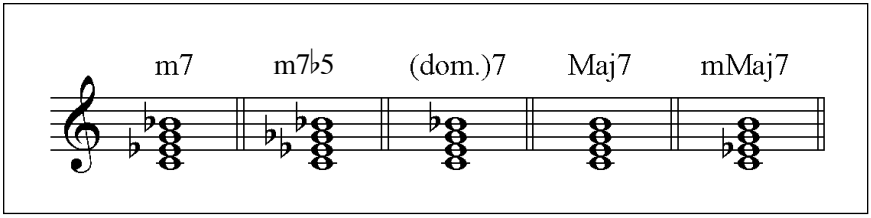
Some chord-scale theories seem to account for differences between allowable melodic tones and allowable chord tones.[7] However, certain of these authors maintain that the one-to-one correspondence exists and simply treat problematic tones as exceptions. For example, Mark Levine's *Jazz Theory Book* insists that scales are horizontalized chords, but points out that one should avoid tones of scales that should not occur in chord voicings, such as P11^{ths} in major seventh and dominant chords.[8] The assertion that scales somehow generate fully extended chords (or vice-versa) leads to cumbersome taxonomies of scale types and overly specified chord categories. I propose a conceptually neutral space where a

[6] The Lydian dominant scale is the fourth mode of the jazz minor scale. The jazz minor scale is equivalent to the ascending form of the melodic minor scale (sometimes referred to as "the acoustic collection"). A Lydian dominant scale on G would consist of the pitches G, A, B, C♯, D, E and F.

[7] Lawn and Hellmer, *Jazz in Concept and Practice* is especially sensitive to this difference, as the authors deal with allowable extensions and chord-scale relationships in different chapters. See also Baker, *How to Play Bebop*; Levine, *Jazz Theory*; and Reeves, *Creative Jazz Improvisation*.

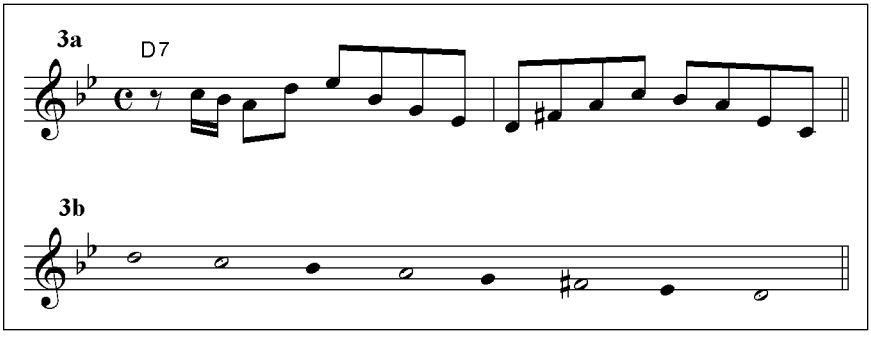
[8] See Levine, *Jazz Theory*, 34-37 and Reeves, *Creative Jazz Improvisation*, 37-38.

chord symbol's core arpeggio of root, third, fifth, and seventh is a suitable anchor for pitch-class correspondence between harmony and melody. Example 2 shows core arpeggios of the five basic chord types that constitute the harmonic language of bebop: minor seventh, half-diminished, dominant seventh, major seventh, and minor major seventh.[9]



Example 2 - Core arpeggios of the five basic chord types.

Example 3a, a passage by Charlie Parker, demonstrates the utility of core arpeggios.[10] Example 3b represents the pitch-class content of the passage as a linear collection of pitches. The core arpeggio tones of the sounding D7 chord are hollow note heads, while intervening tones are darkened. This representation helps illustrate how less structural pitches relate to core arpeggio tones.



Example 3 - Charlie Parker, "Red Cross," 1st solo chorus, mm. 17-18.

Steve Larson's "Schenkerian Analysis of Modern Jazz: Questions About Method" and Steven Strunk's "Bebop Melodic Lines: Tonal

[9] Readers may wonder why the diminished seventh chord is not listed here, as p. 20 of Mehegan's, *Jazz Improvisation* cites it as a basic chord type. The reason is that the chord commonly functions as a rootless dominant ninth chord. In most other contexts, it functions as a common-tone diminished chord.

[10] *The Charlie Parker Omnibook* (Atlantic Music Corp., 1978), 67.

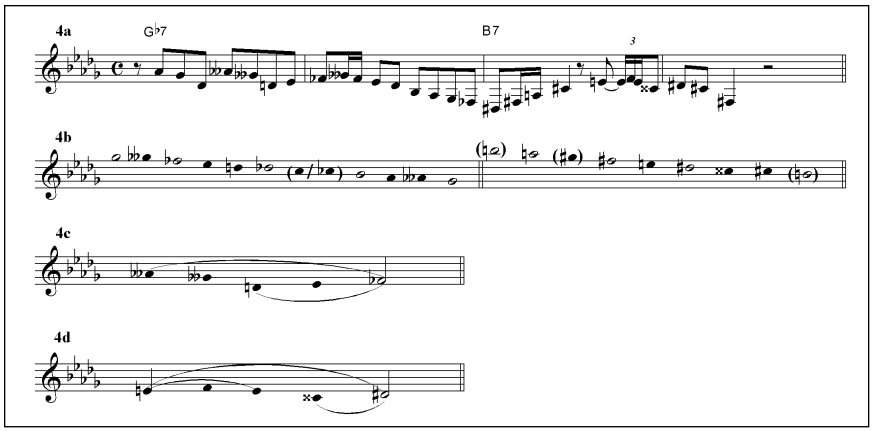
Characteristics" argue that the upper extensions of chords in modern jazz are best understood as stepwise displacements of more structural tones.[11] Henry Martin's "Charlie Parker and Thematic Improvisation" makes a similar argument for the interpretation of jazz melody: "In bebop melodic lines, passing and neighbor tones, as the most familiar non-chord tones from standard tonal theory, are ubiquitous and should be understood as structurally dependent on the chord tones they connect."[12] Some readers may find it helpful to conceptualize passages like that of Example 3a in terms of Schenkerian diminution and structural levels, with the core arpeggio existing in the background, and the melodic pitches of the foreground creating paths between them. We should not view the array of notes in Example 3b as a scale. Example 3b maps the pitch content of the passage onto two levels of pitch-class space, and it shows the relationship between these levels in a convenient, linear fashion. Example 3b illuminates the function of the upper neighbor E♭ major arpeggio (see the black notes) in a way that the nonetheless accurate chord-scale designation "harmonic minor, mode V" does not.

Example 4a presents a passage by tenor saxophonist Harold Land.[13] Example 4b (next page) illustrates how the pitch-class content of Land's melodic line relates to the sounding harmonies, but it models this relationship differently than Example 3b. Example 4b attempts to arrange the pitch classes that occur over each chord into chord scales. To make complete chord scales with members on every scale degree, it interpolates pitches that do not actually occur in the passage. Given the viability of both perfect 11^{ths} and raised 11^{ths} in chord scales for dominant seventh chord types, it allows either C or C♭ in the pitch-class collection that sounds over the G♭7 chord. It allows G♯ in the B7 chord scale. This is a more likely choice given the two most popular chord scales for this chord type, Mixolydian and Lydian dominant. The abundance of pitches

[11] Steve Larson, "Schenkerian Analysis of Modern Jazz: Questions About Method," *Music Theory Spectrum*. 20, no. 2 (1998): 212; Steven Strunk, "Bebop Melodic Lines: Tonal Characteristics," *Annual Review of Jazz Studies* 3 (1987): 97-98.

[12] Henry John Martin, *Charlie Parker and Thematic Improvisation* (Lanham, MD: Scarecrow Press, 1996).

[13] Example 4 is transcribed from The Clifford Brown and Max Roach Quintet, *Brown and Roach Inc.*, EmArcy 814 644-2, © 1954 PolyGram Records, Inc.

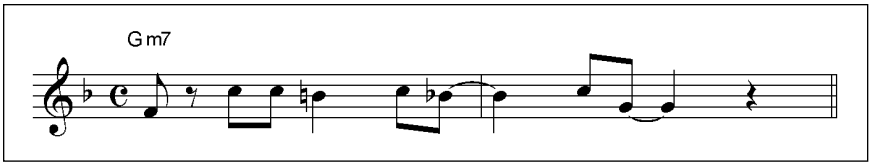


Example 4 - Harold Land, "Stompin' at the Savoy," 1st solo chorus, mm. 17-20

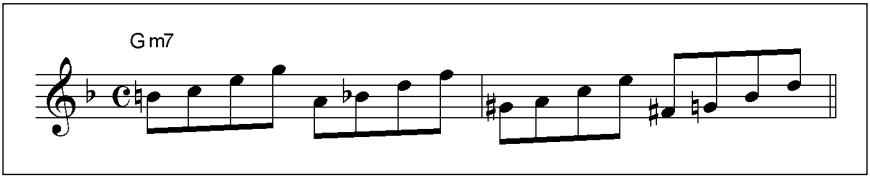
in both of the collections illustrated in Example 4b suggests that the pitch content of either measure should not be considered in terms of scales. Although both collections occur over chords of the same type, and contribute equally to a line of surprising continuity, when viewed as scales, the differences between these collections are striking. It seems unnecessarily complicated to describe Land's approach to inventing this phrase as marked by a dramatic change of chord scales at its halfway point.

The pitches in these collections do not even follow some of the rules of chord-scale theory. In measure 17, for instance, G𝄫 occurs over a G♭7 harmony, a juxtaposition that conflicts with the true chord seventh, F♭. Notice (in Example 4a) that the G𝄫 is even followed by a leap. The pitch presents no conflict to the listener, however, as it is part of a larger enclosure of F♭. Example 4c illustrates. Since all of the pitches that occur over the G♭7 chord do not function at the same structural level, it is not necessary to consider them as some alternative chord scale or as the linearization of some ultra-chromatic chord. Similarly, over mm. 19 and 20 of Example 4a, we see that when the pitches C♯, E, and F occur, they are not alterations *per se*; that is, they do not function within the overall voice-leading scheme of the B7 chord. Example 4d shows how they form local embellishments that resolve within the sounding chord to D♯, a tone of the core arpeggio. For this reason, it is of little pedagogical or analytic value to consider these pitches part of some altered dominant scale on B.

Other infractions occur in Examples 5 and 6, excerpts from a Charlie Parker solo.[14] At Example 5, B♮ clashes with a Gm7 chord. At Example 6, B♮ sounds against the same chord as an incomplete lower neighbor to the first of a descending sequence of arpeggios. While chord-scale theorists across the board proscribe playing tones that create such dissonances against sounding chord structures, these very dissonances characterize the bebop style by implying chromatic lines that lie just beneath the surface.



Example 5 - Charlie Parker, "Ah-Leu-Cha," 1st solo chorus, mm. 25-6

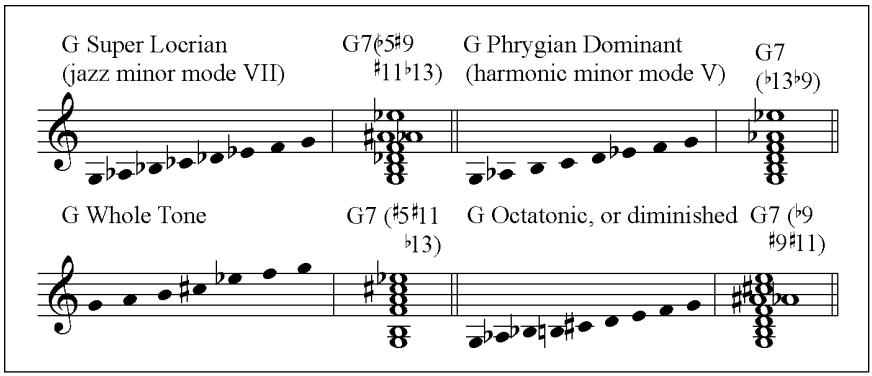


Example 6 - Charlie Parker, "Ah-Leu-Cha," 2nd solo chorus, mm. 9-10

There is no distinction between regular and altered dominant chords at the level of the core arpeggio. Chord-scale theories often distinguish between these, assigning modes such as Mixolydian or Lydian dominant to the unaltered type, and jazz minor mode VII to the altered. Some authors recognize more types of altered dominants that correspond directly to scales or modes, such as harmonic minor mode V, and the whole-tone and octatonic collections.[15] See Example 7 (next page). But players often create lines over dominant chords that are not adequately accounted for by any of these types. It is sufficient to recognize that 9^{ths}, 11^{ths} and 13^{ths} are elastic; altered or not, we hear them as neighbors to core arpeggios tones and not necessarily as parts of a scale.

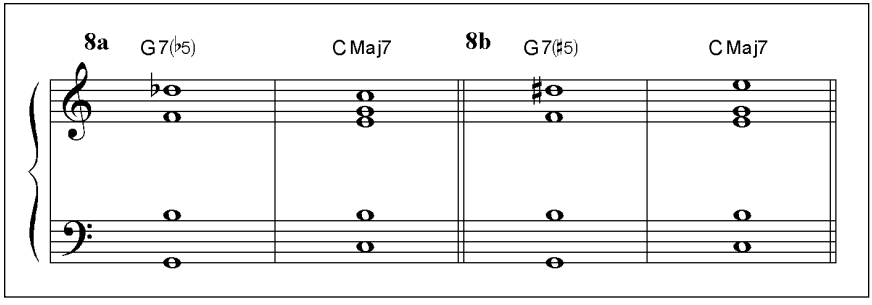
[14] *Omnibook*, 87-88.

[15] See, for example, Levine, *Jazz Theory*, 70-72, 81-94, or Reeves, *Creative Jazz Improvisation*, 209-216, 225-229.



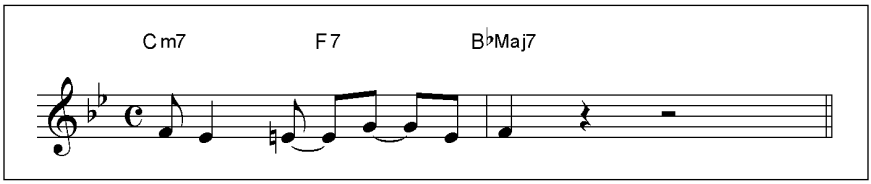
Example 7 - Altered dominant scales and their corresponding chords

Dominant seventh chord symbols often tell improvisors to alter fifths by raising or lowering them one semitone. However, the functions of lowered fifths are usually better understood as raised 11^{ths}. Similarly, raised fifths are usually better understood as lowered 13^{ths}. In other words, if we do hear the pitches that occur in improvised lines above a sounding chord in relation to the nearest tone of that chord's core arpeggio, we should usually hear the pitches a semitone away from the fifth above a chord root as tendency tones against this more structural tone. When the fifth of a dominant chord is truly altered, its function is best understood in light of the chord that is about to sound. The D♭ in Example 8a is a true lowered fifth that resolves to the root of the subsequent tonic chord. Similarly, the D♯ in Example 8b is a true raised fifth that resolves upward to the third of the subsequent chord.



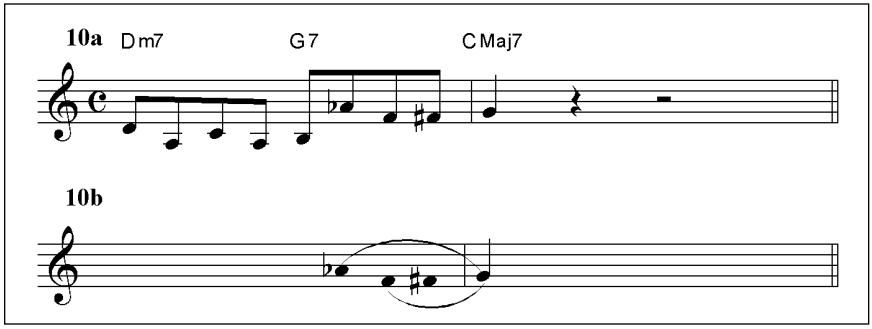
Example 8 - The functions of true altered fifths

This brings us to my second problem with chord-scale theory, which is that it does not encourage analysts to differentiate between pitches in a line that relate to a *sounding* chord and those that relate to a chord that is *about* to sound. I refer to the former relationship as an "immediate context," and the latter as a "target context." This problem also requires us to consider structural levels. See Example 9, a passage from Charlie Parker's solo on "Thriving from a Riff."[16]



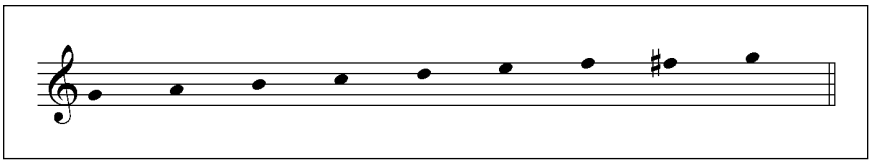
Example 9 - Charlie Parker, "Thriving From a Riff," 2nd solo chorus, mm. 10-11

In this ii-V-I progression, Parker plays an E that conflicts with both pre-dominant and dominant chords. By leaping away from the dissonance, Parker heightens our awareness of the conflict it creates in an immediate context. But in a target context, this tension is part of a larger enclosure of F♮. When F♮ sounds, it does so as the fifth of the tonic chord. In Example 10, an excerpt from another Charlie Parker solo, the sequence of pitches A♭, F, F♯ in the last three eighths of bar 24 forecasts a resolution that listeners expect to hear over a tonic harmony.[17] Example 10b shows how these pitches serve a clear voice-leading purpose as part of an enclosure of the fifth of the following chord, C major. It makes little sense to fit the cluster of pitches A♭, G, F♯ and F into a dominant chord scale on G.



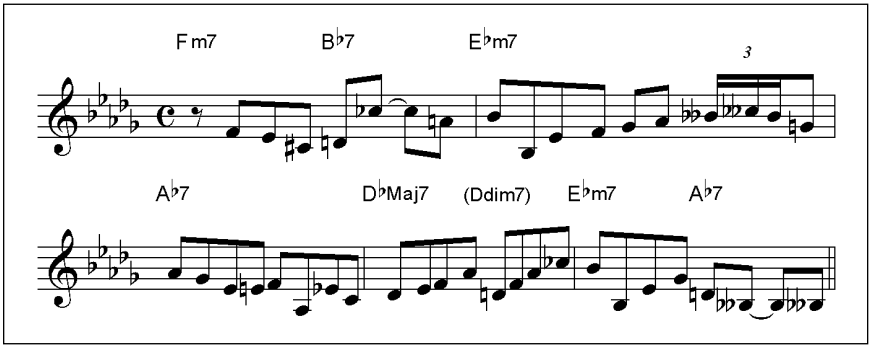
Example 10 - Charlie Parker, "Yardbird Suite," 1st solo chorus, mm. 24-25

[16] *Omnibook*, 61.
[17] *Omnibook*, 9.



Example 11 - The bebop scale, on G

The F♯ at the end of the first measure of Example 10 would not normally occur in a G7 chord scale for fear of it conflicting with the V7 against which it is set. However, some chord-scale theorists allow the pitch in a collection known as the bebop scale. Example 11 shows its most popular form. Chord-scale theorists often mention this scale, stipulating that players must treat the raised seventh in passing.[18] This stipulation does hint at a perspective of jazz melody that admits more than one structural level, but even this broadened perspective cannot account for the present example, where the melodic goal of this short gesture is a single pitch over another chord. Furthermore, the bebop scale does not account for the A♭, which is clearly part of the same gesture that contains F and F♯ and not a member of another chord scale that was abandoned in mid-phrase.



Example 12 - Clifford Brown, "Stompin' at the Savoy." 1st solo chorus, mm. 4-8

[18] Levine, *Jazz Theory*, 171-179 takes a general approach to the concept, defining a bebop scale as any "traditional scale [or mode] with an added chromatic passing note" (171). Reeves, *Creative Jazz Improvisation*, 52-66, discusses the "bebop 7th" scale, which corresponds exactly to Example 11. He observes the practice of using the scale to enclose pitches in immediate contexts (55). Baker, *How to Play Bebop* vol. 1 is the most comprehensive work on the topic. His approach is as general as Levine's; like Reeves, he discusses enclosures. None of the authors, however, discuss the function of the bebop scale in target contexts.

Example 12 is a passage from Clifford Brown's solo to "Stompin' at the Savoy."[19] Although certain pitches in his line violate rules of chord-scale theory, the melody is still sensible and harmonically unambiguous. While B♭7 sounds, the A♮ resolves upward to the fifth of the E♭m7 chord in m. 5. Likewise, the G♮ (m. 5) that sounds over E♭m7 is a leading tone to the dominant chord that follows. Chord-scale theories would proscribe such pitches, causing some to conclude that they create harmonic conflicts. But throughout Example 12, chromatic melodic tones between seventh chords create reasonable amounts of melodic tension, and melodic tension can be different from harmonic tension. Brown's approach to constructing bebop lines is sensitive to this difference, and this sensitivity allows him to improvise in a style that experienced listeners of jazz recognize as harmonically informed, but melodically driven. Although Brown developed his style well before the advent of any codified chord-scale pedagogy, his lines demonstrate how one can bridge the gap between current jazz pedagogy and musical practice.[20] Part II of this study offers an instructional method for jazz improvisation that introduces rules of voice leading and dissonance treatment in a way that develops within each student an understanding of the difference between incidental dissonance at the melodic level and essential dissonance at the harmonic level.

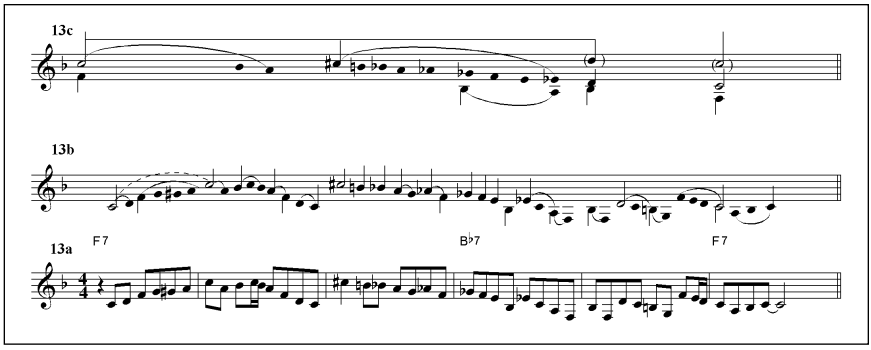
Situations that involve this failure to distinguish between immediate and target contexts are not limited to singular "wrong notes" like major 3rds on minor chords and major 7^{ths} on dominant and minor seventh chords. Example 13a shows mm. 2-7 of Cannonball Adderly's solo on Thelonious Monk's "Straight, No Chaser,"[21] illustrates a relatively expansive target context. Several pitches in measure 4 are heard entirely in anticipation of the B♭7 chord at bar 5. These pitches do not necessarily constitute a viable chord scale for F7. The tension created by the initial pitch, C♯ creates an expectation for D♮, the third of the approaching B♭ chord. This expectation is not satisfied until m. 6, after every other pitch in the aggregate has sounded. The pitch content of mm. 4 and 5

[19] Brown and Roach, *Brown and Roach Incorporated*, 1954.

[20] The first published work on chord-scale theory is generally recognized as George Allan Russell's *Lydian-Chromatic Concept*, published in 1959. However, John Mehegan's *Jazz Improvisation*, 84-98, of the same year, addresses the topic on a more rudimentary level.

[21] The Miles Davis Sextet, *Miles and Monk at Newport*, Columbia, CL 2178, © 1964 Columbia Records.

sets up an expectation for the third of the approaching chord by passing toward this goal in two directions at two levels of structure. Example 13c illustrates. A line of tones extends downward from C♯5 to E♭4, spanning an augmented sixth. The resolution of E♭4 to D4 implies a resolution of C♯5 to D5, and this allows a continuation of the ascending chromatic line that passes from C5 (m. 2) through C♯5 (m. 4) to an implied D5 (m. 6) at a higher level of structure.



Example 13 - J. "Cannonball" Adderly, "Straight, No Chaser," 1st solo chorus, mm. 2-7

Part II

I have discussed the problems above mainly in terms of the challenges they present for analyses informed solely by chord-scale theories. If chord-scale theory is inadequate to the task of explaining typical bebop lines, then surely it is not up to teaching students how to play them. This section of the article confronts the larger problem of instruction in improvisation. When chord-scale theories verticalize scales or modes, they isolate tones from the contexts that define them. This is why the novice will not understand how to resolve the "altered" pitches of an altered dominant chord scale by simply practicing the scale. But we can teach students to be aware of the tension any melodic tone would create against the core arpeggios of sounding and approaching chords.

Henry Martin's "Charlie Parker and Thematic Improvisation," Steve Larson's "Schenkerian Analysis of Modern Jazz," Steven Strunk's "Bebop Melodic Lines: Tonal Characteristics" and Richard

Hermann's "Charlie Parker's Solo to Ornithology" argue for the analytical value of considering bebop lines in terms of structural levels.[22] I would add that there is also great *pedagogical* value. A species model for improvisation with various levels of rhythmic and voice-leading activity helps musicians to conceptualize the structural hierarchy of bebop lines. Example 14 gives a model for instruction in jazz improvisation in six species. Before progressing through the species, students should know the major and minor scales in every key. While all of the species in the model except the first use chromatic rather than diatonic space, one should still be aware of the differences in tension that chromatic tones create. Equally important are the core arpeggios of all chord types, such as those listed in Example 2. Students should also be sensitive to the hierarchy of functions in the jazz cycle, a term that refers to the ii-V-I progression that pervades bop harmony, as well as the half-cycle, which refers to the ii-V harmonic pattern with no following tonic.

	Description
1	conjunct motion, core arpeggio tones only
2	conjunct motion, leaps of a third, passing and neighbor tones
3	conjunct motion and small leaps, enclosures
4	compound melody, leaps between structural or non-structural tones
5	conjunct motion and small leaps, alterations of chord fifths in special cases
6	compound melody, alterations of chord fifths, eighth-note triplets

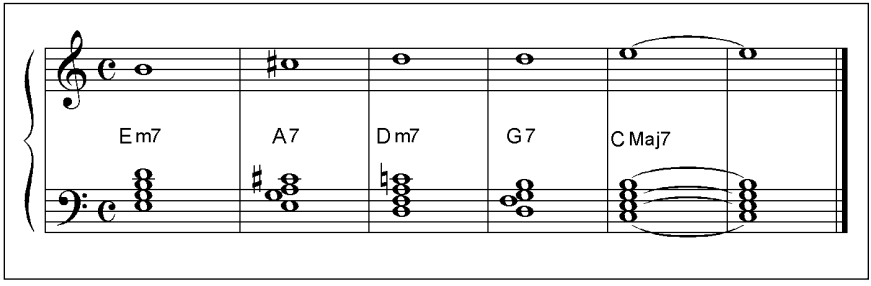
Example 14 - Model for Instruction in Jazz Improvisation

"Cantus firmi" are cycles in major and minor, and they can range from solitary jazz cycles to chains of half cycles that ultimately lead to a full cycle. In all but the last species, students must begin on core arpeggio tones and must resolve to core arpeggio tones of tonic chords by the final pitch. As the sounding chord's core arpeggio

[22] Henry Martin, *Charlie Parker and Thematic Improvisation* (New Jersey: Scarecrow Press, 1996). To an extent, Hermann proposes some didactic application of his own species model for instruction in jazz performance (pp. 248-249).

is always structurally superior in an immediate context, all other pitches can be said to create a type of dissonance. There is therefore no difference between chromatic and diatonic dissonances, although the familiarity with diatonicism that comes from listening to and playing tonal music (and from the inescapable influence of the modern use of Greek modes in typical jazz pedagogical resources) will undoubtedly influence students' intuitions. By eliminating the terminological distinction between diatonic and chromatic, students will gain a more realistic understanding of harmonic conflicts (an inevitability in jazz at all skill levels) and they will develop a more practical sensitivity to them. They will learn to conceptualize their improvised lines in terms of both immediate and target contexts, as defined above.

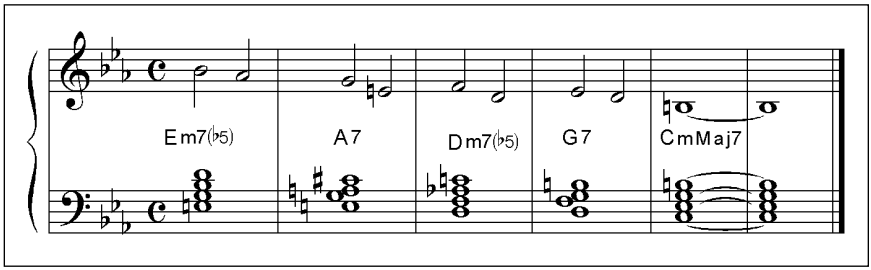
Let's consider some sample exercises. Example 15 is a first species exercise. In this species, the player must use whole notes in stepwise motion. (Outside of a specific diatonic framework, "stepwise" refers to melodic movement by whole tone or semitone). The purpose of this species is to develop an awareness of structural voice leading. For this reason, only tones of core arpeggios may sound at this level of rhythmic activity. Exercises in first species can produce the types of linear intervallic patterns we often hear in tonal music, such as 10-7-10 (a progression of intervals between an upper voice and a bass voice that consistently alternates between 10^{ths} and 7^{ths}) and 5-8-5.



Example 15 - species one

In second species, two notes sound over each harmony, only one of which must be a member of the sounding chord's core arpeggio. This species, along with all subsequent species, allows passing and neighbor tones. Second species also allows leaps between adjacent core arpeggio tones. The improvisor must follow leaps by stepwise movement in the opposite direction. Changes in direction at this level of rhythmic activity begin to produce the kinds of contours we hear in bebop melodic lines. Example 16 is in a minor key, so

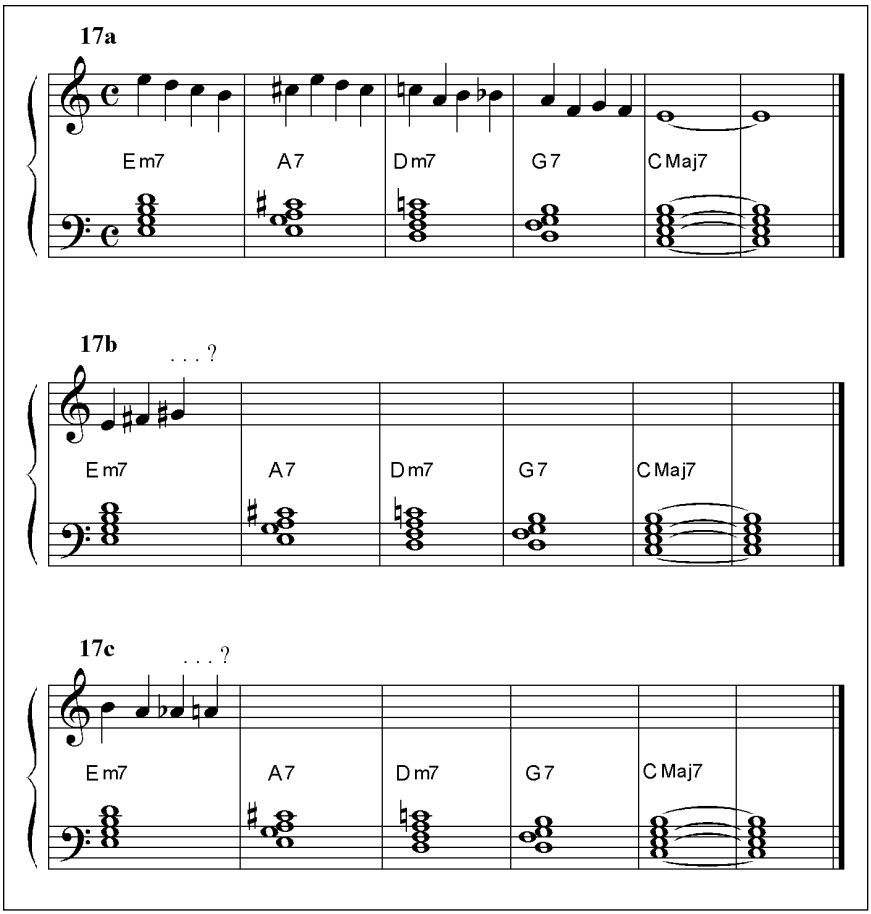
pre-dominant chords are half-diminished and the tonic is a minor major seventh. Notice that the diminished 11th (A♭) that sounds over Em7♭5 produces no aural conflict, since it resolves to G in the following bar.



Example 16 - species two

Third species features quarter notes. See Example 17a (next page). Here students should favor conjunct motion. Leaps of a third are allowed between pitches, provided they are followed by stepwise motion in the opposite direction. As this pitch space is not specifically diatonic, instructors should specify that thirds may be diminished, but not augmented. Leaps of a diminished third must only enclose core arpeggio tones, and motion following this leap should proceed in the opposite direction. When such leaps occur on beats three and four of a measure, they should enclose core arpeggio tones of the approaching chord. This rule facilitates enclosures like those depicted in Examples 9 and 10. As students get increasingly comfortable with the idea of enclosing pitches, they will begin to sense where to put tendency tones in their lines without being constrained by chord scales. For example, in the 4th measure of Example 17a, a student has enclosed the root of the G7 chord with A and F. This enclosure will come across somewhat weakly, and sensitive musicians will learn through experience that enclosures are stronger when at least one of the pitches is a minor second from the targeted note.

There are dangers of mistreating tension in this species. See Example 17b. Here, a student has reached a troublesome dissonance over the first chord. Hopefully, the first two species will develop sensitivity to core arpeggio tones to such a degree that situations like this would be rare. Still, this kind of conflict often happens in real jazz, as when a soloist substitutes a dominant seventh chord type for a minor seventh without telling the accompanist, or vice-versa. In this species, we can avoid conflicts like that in Example

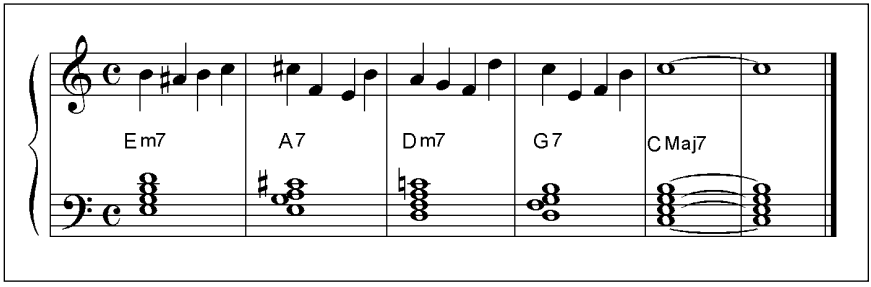


Example 17 - species three

17b by making this simple rule: core arpeggio tones may not be altered. Enforcing this rule, we see that the G♯ must really be an A♭. As such, the student must treat the diminished third F♯→A♭ like an enclosure and resolve to the G natural. A line like that in Example 17c must be heard as a stepwise approach to the third of the sounding chord. Cases such as these require another rule: a melodic tone that approaches a core arpeggio tone to within a half step of it must resolve immediately. Therefore, the student cannot change direction on the A♭, and must play a G on beat four. This rule applies to species three through six. There are two allowable exceptions to this rule. The first exception involves cases where the chord changes before the resolution can occur. In such a case, the melodic line should still resolve if the core arpeggio tone is common

to both chords. The second involves cases where a tone sounds as the first part of an enclosure. In such a case, the resolution must happen by the end of the next beat.

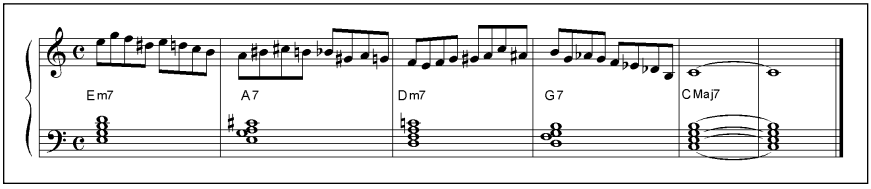
In fourth species, quarter notes occur in compound melody. See Example 18. Leaps larger than a third are allowed, but no leaps should exceed an octave in size. Leaps do not need to be balanced by opposite stepwise motion, but leaps to non-structural tones must resolve to the nearest structural tone. The melody at m. 2 observes this rule. Here, the leap from C♯5 to F4 over A7 is followed by a resolution to E4. In the event that the non-structural tone is equidistant from two core arpeggio tones, the rule of opposite stepwise motion should prevail. Leaps larger than a third from non-structural tones may only happen on the downbeat of a measure, and the melody must return to the register of the non-structural tone before the end of the measure and resolve the dissonance. The melody at m. 4 observes this rule. Here, the leap from C5 over G7 creates tension against the B♮ in the core arpeggio. The leap to B4 at the end of the measure resolves this tension. The rule against altering core arpeggio tones still holds. In this species, students create lines that derive meaning from target contexts. As a result, students begin to create lines that sound quite idiomatic.



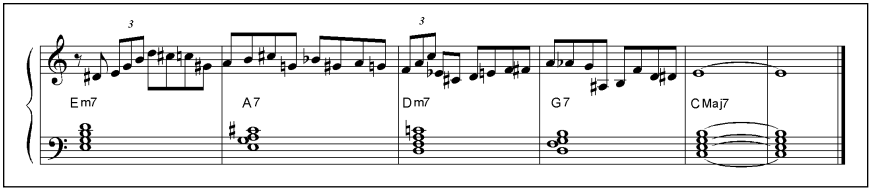
Example 18 - species four

Species five features eighth notes. See Example 19 on the next page. Leaps of a third may occur between tones regardless of their inclusion in the sounding core arpeggio, provided such leaps are balanced by stepwise motion in the opposite direction. Here, augmented seconds may occur melodically when the first pitch is a core arpeggio tone and the second is a half step away from another core arpeggio tone. As augmented seconds are perceived as leaps, resolutions to the nearest core arpeggio tone must immediately follow them. The melody at m. 2 follows this rule. Here, a resolution

to C♯ follows the ascending augmented second A-B♯. These may occur anywhere on the first three beats of a measure. When an augmented second occurs on beat 4, the interval should prepare a resolution by semitone to a core arpeggio tone of the chord in the approaching measure. Students may alter core arpeggio tones in two cases. One case occurs in a target context, and involves the last beat of a measure. Here, such an alteration may sound provided it resolves in the direction in which it was altered to a structural tone of the approaching chord. In observance of this rule, the D♭ in m. 4 resolves to the C in m. 5. The second exception involves an immediate context, and applies when a student approaches a chord root by way of an altered seventh, or vice-versa. The second measure of Example 15 shows the enclosure of the chord root A with the tones B♭ and G♯.



Example 19 - species five



Example 20 - species six

Finally, sixth species features eighth notes in compound melody. See Example 20. In sixth species, students may begin after an eighth rest, omitting the core arpeggio tone. License is given to leap from any type of note to any other, provided that, within two eighth notes, the nearest member of the sounding chord's core arpeggio follows it. By permitting an additional eighth note to sound before resolution, sixth species allows more prolonged enclosures. See, for example, the sequence of pitches G-B♭-G♯-A at m. 2. Another type of exception should be made when such a leap occurs on beat four of a measure, in which case a student may resolve one beat later to the nearest member of the approaching chord's core arpeggio. The melody across mm. 1-2 observes this rule, where the leap

from C to G♯ over Em7 is followed by a resolution to A over A7. Rules regarding alteration of core arpeggio tones are the same as they are in fifth species. Having become proficient in sixth species, students may employ eighth-note triplets, provided they outline core arpeggios and use but one triplet per measure.

As of yet, no species in this model deals with suspensions or retardations. The embellishment of suspensions and retardations involve additional layers of structure. Such complications bring the topic somewhat outside the scope of the present study. To understand the nature of suspensions and retardations in bebop improvisation in the spirit of this species model, one would have to start with something at the rhythmic level of species 1 with the melody delayed by one or two beats. A whole series of species would necessarily follow; gradually increasing in rhythmic activity while allowing more freedom in embellishing delayed resolutions.

Depending on the student, the progression of species proposed in Examples 15-20 may be fast-paced. All students, regardless of skill, will need time to assimilate the later species. As students become more sensitive to how the more structural chord tones relate from chord to chord in typical bebop progressions, the rules for leaping become less strict. In the more rhythmically active species, computer transcriptions or recorded playbacks will enable students to assess what they liked, and what they did not like. Students should be challenged to explore each species thoroughly before proceeding to the next one. They should also be encouraged to notate examples in a new species before attempting to improvise in them. Doing so will allow then to realize possibilities that they might not have played off the cuff. The next step would be for them to play what they have written in real time.

The private lesson is the optimal setting for implementing a species approach to jazz improvisation. Students would progress through the species, playing through stock progressions such as the iii→V/ii→ii→V→I cycles given above. After gaining proficiency, they may apply the species method to jazz standards, choosing tunes whose harmonic progressions differ progressively by degree from the cycles given in Examples 15-19. However, as students grasp (and inescapably, transgress) new rules of voice leading and dissonance treatment, their own melodic styles will develop. For this reason, peer review is recommended, and master class or seminar settings could provide invaluable feedback. The analytical discussions in the first part of this article offer a unique analytical

perspective that can be used in the jazz theory classroom. Teachers can begin to explain transcriptions of master improvisors in terms of how they create tension around core arpeggio tones.

While these sample exercises consisted only of cycles and half cycles, students could take a species approach to parts of tunes or entire tunes from standard repertoire that are comprised of predominantly jazz-cyclic harmonic motion. And, with an extended vocabulary of core arpeggios, possibilities abound for species approaches to tunes of more recent vintage (i.e. modal tunes, such as Miles Davis's "Flamenco Sketches," tunes that combine modal harmony with more traditional jazz harmony, such as Wayne Shorter's "Ana Maria," or even more modern works by Pat Metheney, Dave Holland, or Dave Douglas). Because such studies require modification of the species model, they would be appropriate for advanced private teaching. Fortunately, the idea of mastering improvisation at levels of increasing rhythmic complexity where rules of contrapuntal engagement gradually allow freedoms is really quite elastic. It exists independently of the specific model offered here, and can be applied to a lerge number of "cantus firmus" types. It is also possible to use this model to embellish normative or idealized middleground structures in first species examples (such as 5-lines or 3-lines, various linear intervallic progressions) with the aim of developing lines with more formal integrity in a Schenkerian sense. Again, this option is best reserved for advanced private study.

In bebop, the voice leading that takes place melodic lines is far less restricted than the voice leading that takes place in harmonic accompaniment. The melodic resources used in improvisation are not derived from the pitches that typically occur in fully extended harmonies. Furthermore, the meaning of any tone in a line may be derived by the context of the sounding chord or by the context of the chord that is about to sound. Numerous melodic notes may occur over one harmony. And when they do, a complex of at least two structural levels usually develops. A certain degree of elasticity with regard to the rules of chord-connections-via-melody obtains in these situations (as evidenced by modern jazz practice). As teachers and players, we need to be sensitive to these situations, as they often comprise the very basis and essence of the bebop style. We cannot teach jazz improvisation with a method that recognizes the standard melodic fare of such masters as Charlie Parker, Clifford Brown, and Cannonball Adderly as anomalous. We cannot teach

jazz improvisation without taking into account the differences between structural levels, sounding and approaching chords, and also between harmony and melody. The instructional model offered here enables students to make these distinctions in real time. By developing sensitivity to the more structural harmonic tones in bebop, and understanding how they connect, more students will bridge the gap between theory and practice.

Master Teacher Column* Inspired Accidents: Spontaneous Invention in Musical Performance

MICHAEL R. ROGERS

It is possible for an artist to have stupendous technical prowess, to be able to amaze and delight audiences with dazzling virtuosity, and yet there is—something lacking. We all at one time or another have had the experience of hearing a fantastically impressive performance . . . in which this mysterious something is not there. The superficial brilliance pulls an automatic reaction from us ("Wow") . . . it's like meeting a beautiful person . . . who turns out to have no brain, or no heart. One instinctively says "Wow," . . . even if on second look there's not much there.

On the other hand, most of us have also had the experience of hearing an unsophisticated performance that may be full of wrong notes, or [one] by a street musician [or even a child] in which we are moved to tears, immobilized with a palpable feeling of awe.[1]

*Editor's note: It is our observation at *JMTP* that, when it comes to pedagogy, "revered" writing is as instructive, sometimes more, than "refereed." Reflective teachers who have completed long and successful careers in the classroom have unique insights, perhaps even warnings, to make, pertaining especially to trends, pitfalls, traditions, and the nourishment of holistic and effective pedagogies and approaches. Invited submissions from such "master teachers" are consistent with the journal's mission and certainly within the founding spirit of the Gail Boyd de Stwolinski Center for Music Theory Pedagogy. This column, by former JMTP editor Michael Rogers (cited five times in this issue alone), and author of *Teaching Approaches in Music Theory*, inaugurates what we trust will become regular contributions by similarly "revered" teachers.

[1] Stephen Nachmanovitch, *Free Play: Improvisation in Life and Art* (Jeremy P. Tarcher, 1990), 119.

Even when conventionally appropriate phrasing and shaping are heard in a musical rendition, intangibles can seem missing. To distinguish not just between "the musical" and "the unmusical" but also between "the musical" and "the ultramusical" and to inquire why these magical elements—these uncanny "X-factors"—are present or absent in a performance seem among the most burning questions of music study and theoretical training.

To assist my investigation, I have constructed a "Communication Chain for Musical Performance." [See diagram, page 121.] Three basic positions on the flow chart identify Step 1 (extreme left side), the **Composer** who imagines sounds and corresponding notation; Step 2 (far right side), the **Performer** who translates notation back into sounds; and Step 3 (extreme right), the **Listener** who experiences the resultant sounds as music. The capital "L" (for Listener) inside each of the three corresponding boxes reminds us that the composer and performer operate as listeners as well as the audience.[2]

Between Steps 1 and 2, the chart is exploded as various sub-stages are identified and positioned within the larger scheme of performance preparation. Once the composer's role is acknowledged, music study ordinarily begins with relevant "**Historical Background**" information about social context; style; influence; performance practice; and comments by the composer or others. These topics are the core of music history courses in the standard undergraduate curriculum but can also often be found in music theory classes as well, particularly in a "comprehensive musicianship" environment. These topics, among others, can also sometimes be found—and perhaps *should* be found—in the applied music studio, at least when the instruction provides a full-blown "music lesson" as opposed to merely coaching in how to play an instrument. The totality of this scholarship by itself can color the performer's attitude and understanding in positive ways but can also provide a necessary springboard to succeeding phases of learning.

[2] Cf. charts in Frederik Prausnitz, *Score and Podium: A Complete Guide to Conducting* (W. W. Norton, 1983); and Peter Westergaard, "What Theorists Do," *College Music Symposium* 17/1 (Spring 1977): 143-149.

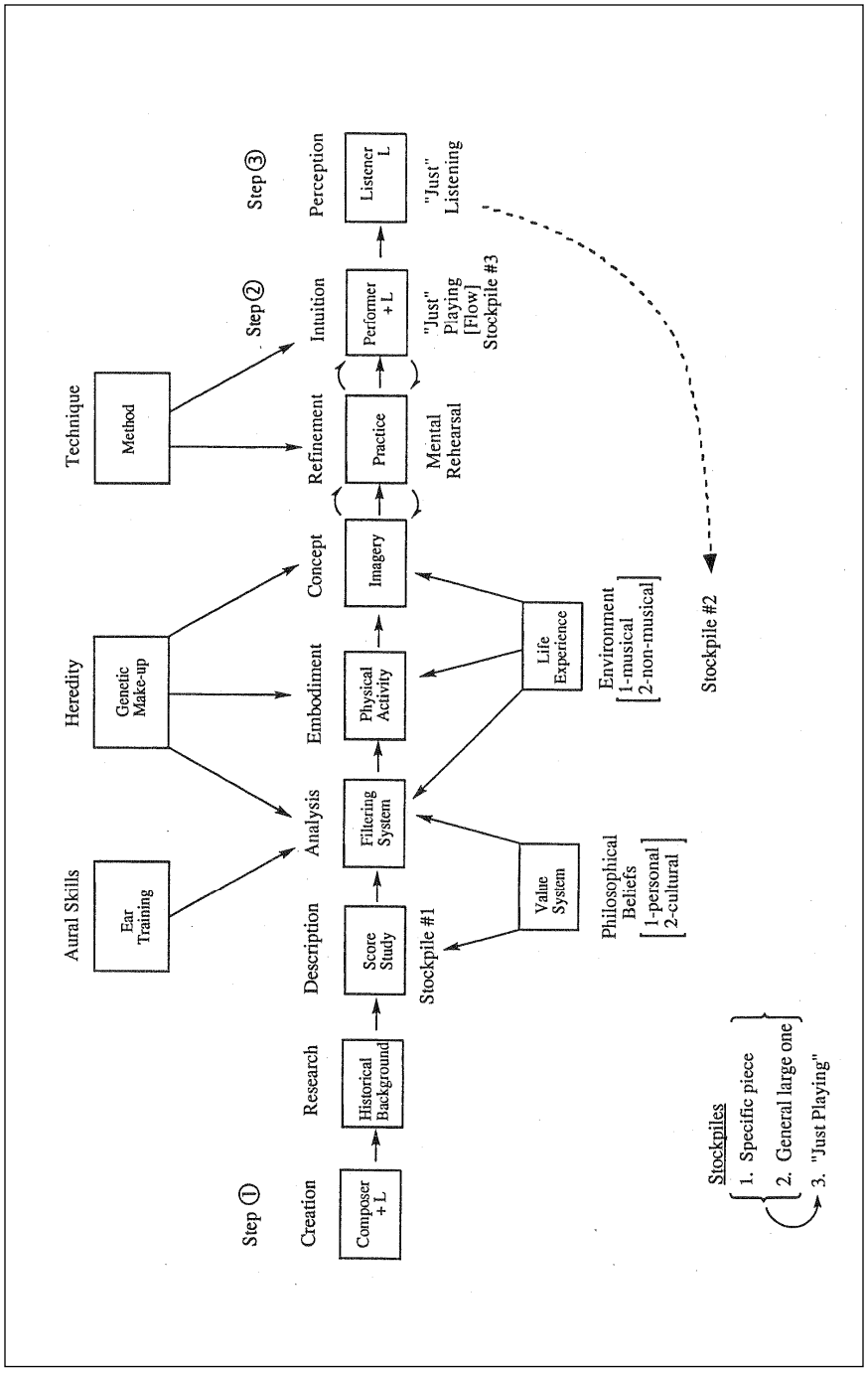


Diagram - Communication Chain for Musical Performance

Next, as we read from left to right across the chart, the category of "**Score Study**" is represented. In examining music, it is desirable to construct a sort of "table of contents" for the given composition by labeling large structural divisions; contrasts of texture and sonority; pitch materials; areas of stability and tension; movement towards and arrival of goals; and so on. Non-pitch factors are important, too, such as dynamics; duration; register; silence; and timbre. Of course, at this stage, the traditional elements of compositional devices and music theory study come into prominence.

Such "description," however, should be distinguished from true "**Analysis**" (the next box), which focuses on "how" and "why" things happen, not just on "what" and "where" questions. Real analysis, then, doesn't just collect facts but interprets them. Very often the analysis proper will emerge, almost imperceptibly, out of score familiarization. What starts as a convenience may well turn into an analysis.[3] Although description cannot replace analysis, an analysis cannot be constructed without the foundation of meticulous preparatory work. Score study, then, is a necessary but not sufficient cause for musical understanding to occur.

Analysis explains necessary connections, relationships, and patterns. Unlike score study alone, which only requires visual inspection of notation and lists of data, analysis activates (and is activated by) one's perceptual and cognitive filtering systems and forces active hearing: organizing, grouping, and comparing events; paying full attention; screening and sifting thoughts and responses through a conceptual sieve that has already been conditioned by previous training, aural skills, personal values, heredity, and overall life experiences (see some of these peripheral factors contributing from the sidelines as they are represented on the chart in boxes above and below the flow of the main categories). The term "score study" is frequently mentioned by conductors as an important aspect of their preliminary preparation before stepping on the rehearsal podium—as it should be. Sometimes, however, the richer contribution of analysis, in combination with score study, is not fully recognized or utilized. The same might be said of any performer, of course, not only conductors.

Doing analysis is more important than the *result*. What counts is not the outcome, but making judgments; using trial and error;

[3] Nicholas Cook, *A Guide to Musical Analysis* (George Braziller, 1987), 240.

testing, revising, and discarding hypotheses; sorting information, weighing alternatives, and weighting facts; endlessly debating with oneself on the significance of evidence; exercising the mind and ears—these are the habits of thinking and listening that we label musicianship. The value of analysis is for the person doing the analysis, not for the one reading it. Analysis is all those steps that make the final product possible and not necessarily the final product itself.

Another stage, "**Embodiment**," is often overlooked as a potential resource for performers—or perhaps for any serious student of music. This activity locates and actualizes the expression of a work within the body through physical exercises. Emotion joins motion. Body language can be a form of musical performance and a form of nonverbal analysis—analysis derived from pure sensation and direct physical experience rather than through rational thought. Some things can be better "felt" than explained or intellectually understood.

When performed with music (either acoustically present or imagined), body exercises—moving, bending, swinging, swaying, stepping, shifting, balancing, counterbalancing, tensing, releasing with the fingers, hands, arms, legs, neck, and torso—can reveal gestural qualities of expression; linear contours; hypermeter; harmonic rhythm; centers of poise; comparative weights of arrival; relative intensity of climaxes; plot thickeners (and thinners); large-scale arcs of design; and silences filled with spilled-over tension, forward-looking anticipation, or simply a blank lull. Such exercises go beyond the ordinary physical maneuvers of dancing, conducting, gymnastics, or calisthenics.

Tacit assumptions about the control, flux, and adjustments of conflict and resolution at both local and global levels become exposed through embodiment training. Body knowledge about how music breathes can be returned to a performance (or to one's listening)—not by adding contrived choreography but by integrating a more supple response to the pace and affects of the composition.

Analysis is too often done as an insipid mental activity. Embodiment honors the fusion of mind and body as a fact of our psychological/physiological make-up; it helps us to recognize music as a living organism through analogous mapping of sentient

processes into our physical being and then uniting these discoveries with the performance (or with our listening). Music can even be listened to with the whole body, not just the ears and brain. Anyone who has felt the sounds from a large cathedral pipe organ vibrating on the skin knows this truth.

Compositions are often considered as inert or immobile constructs like snowflakes or crystals. Embodiment frees us to hear music as states of energy or as a budding flower. Paper-and-pencil analysis can easily be undertaken as laboratory dissection—analysis of dry notation rather than of a living pulse. Embodiment engages our listening with a fervency and immediacy otherwise unattainable. One is ultimately after encapsulating an aesthetic reaction and then transferring that ardent response to the audience.

Contemplation of such a frequently underappreciated (or unknown) resource raises interesting pedagogical questions. Is embodiment an aspect of performance study or of theoretical study? Or of both? Is it worthy of dedicated attention in training music students? Is it just for performers or for everyone? Where would it fit in the curriculum? Where would the time for including it come from? How would teachers learn to do it? Should it be part of a theory pedagogy course for graduate students?[4]

Flowing on, "**Musical Imagery**," could be defined as the concept of "how a piece goes"—an idealized performance likeness that is carried inside one's head. This concept is a byproduct of all the preceding stages. Imagery absorbs the features, thought, raw sensation, and expression from research, score study, analysis, and embodiment. All the previous strands commingle and reformulate here.

Imagery, though, could include other facets besides just inner hearing, such as picturing a piece as an evolving shape of bulging pressures or deflating respites. Or the unfolding plot of a play—a narrative trajectory—could provide a conceptual analogue for

[4] For the most comprehensive writings on embodiment and its relation to music theory, see Alexandra Pierce, *Spanning: Essays on Music Theory, Performance, and Movement* (University of Redlands, CA, 1982, by the author); Alexandra Pierce and Roger Pierce, *Expressive Movement: Posture and Action in Daily Life, Sports, and the Performing Arts* (Plenum Press, 1989) and *Generous Movement: A Practical Guide to Balance in Action* (The Center of Balance Press, 1991).

crystallizing an image. We might experience a psychological profile of a composition with emotional resonances of conflict, wit, poignancy, surprise, suspense, or stasis. Distorted or out-of-tempo time realms might be involved, too—an endless stretch of unwavering mood, or at the opposite extreme, an instantaneous spark of insight that distills the heart of a composition into a wordless impression.

Aural images could be bonded with pictorial ones: e.g., of some dramatic scenario, say, during a Mozart minuet, where imagined characters act out stylized gestures with bows, face-offs, pirouettes, or curtsies; or where a dancing lady in a swirling red dress emulates the contours and jazzy inflections of Ravel's "Bolero." Examples of interpersonal relationships; abstract geometric designs; colors; scenes from nature; optical illusions; dreams; kaleidoscopic shifts of focus; paintings, sculpture, and architecture could be visualized to reinforce fictitious or material sounds.

Bodily perceptions of listening—muscular tightening and relaxing—or of dancing or conducting music might vitalize images. Recalled perceptions of singing or playing are another resource: the feel of taking a breath; blowing a stream of air through a tube; moving a bow over strings; pressing down keys; firming and loosening an embouchure; and bending and leaning to the forces of directed motion can all be internalized. Unlike with embodiment, however, where actual physical movement is involved, we are now here talking specifically about interior activity within the imagination alone.

An alert listener will recognize the meaning and impact of the rhythmic pattern that pervades the first movement of Bruckner's Fourth Symphony: the paired quarter notes and quarter-note triplets. Such a pattern is often psychologically associated with human movement—the image of a compressed body rising, as from a crouch, slowly at first, then more swiftly to full stature. The effect of physical rising being tapped into helps to give this kinetic action its uplifting, life-affirming quality and provides a striking kinesthetic image for a conductor.

Metaphors or purely verbal connotations, as opposed to visual representation, can also link with a musical impulse. In variation 24 (a slow fugue) of Beethoven's Diabelli Variations, the concept of "altitude" could be helpful in permeating to the music's core. The top line often seems to be straining upwards with a sense of urgency or struggling as if a mysterious force was trying to push an invisible

ceiling ever higher. Without actually picturing mountain climbing, the idea of "altitude" alone suggests height, soaring, reaching, or even more lofty thoughts such as elevation and eminence. Such language stimuli might subtly augment the desired mood and character of the passage.

"**Practice**" is ordinarily realized with the given instrument, voice, or ensemble ready at hand. Many hours of such contact rehearsal are required for technical and musical acquisition. Acquiring "technique" is represented here on the chart as another outside influence. My model, however, is not mainly concerned with learning the notes of a piece or with fluency or facility on the instrument but rather places uncommon emphasis on practicing silently away from the instrument. It is based on the needs of conductors, who, because of insufficient rehearsal time with their ensemble, must often practice their interpretation in the privacy of the mind. Internal practicing, though, can often be as vivid as the real thing. In fact, making it vivid first in the mind will help ensure it being vivid later in concert. What seems initially to be an impediment for conductors—limited time with the full group—can be a blessing in disguise and offers an opportunity for non-conductors as well.

Mental rehearsal, then, done away from the ensemble, the piano, or voice should be especially prized. *What* is being practiced is the refinement of imagery. Feedback loops along the entire chain would be triggered during such practicing. Details from earlier stages would be seen in new light as mutually complementary relationships between practice and imagery are developed and explored—intertwined like braided cord.

As imagery is continuously burnished through physical *and* mental practice, its content is enlarged and enormously empowered which, in turn, affects what is being practiced. [Notice the circular arrows on the chart connecting these two categories.] This reciprocity engenders an improved version of "how it goes" that is then carried forward into the recital auditorium.

It is also possible, as a part of practice, to imagine the whole larger environment that surrounds any real performance—walking onto the recital hall stage; feeling the blood rush to your head;

feeling your legs stretch as you bow; feeling the initial contact with the instrument as you position it to your body; looking into bright lights on the stage; hearing the opening tone spill out into the vast acoustics of the concert hall (the "ringing-in-the-rafters" effect). All of these sensory stimuli are created during the imagery phase and then honed to perfection through mental practice.

The imagined and internally practiced version must eventually be wedded to the actual public performance. It is as if the aural image, after enhancement by practice, becomes imprinted on a virtual compact disc carried inside the brain. When played back, this private version escorts the real performance to fulfillment by pre-echoing, ideally, the sounds emanating from the instrument. The pianist, let's say, wrapped in the current of sound she is producing, loses track of playing the piano and is, when everything jells, simply creating music out of a deep synchronicity between the imagined sounds inside her head and the actual sounds inside the piano—riding the waves of imagination, so to speak, into the concert hall. A psychological state of "flow"[5] emerges and the two sources of sounds—one from the head and one from the instrument—meld into a single stream.

When an imagined act and result fuse in this way, athletes often speak of being "in the zone" or "in the groove." Race car drivers, for example, speak about the car, the driver, and the road melding into oneness—racing on "driver's planet," as they say, where time slows to a crawl while traveling 300 yards per second. Similarly, climbers meld with the mountain or a team of surgeons melds into a unified group in the operating room, performing a kind of coordinated ballet. As an ancient proverb states, "The hand is the thing, not the fingers." In music, the highest level of chamber performance, such as within long established string quartet ensembles, can often achieve a state of "concinnity" (harmonious agreement of parts as in a well-tuned engine or finely made watch), where all the members seem to be breathing together, where all their individual thoughts and impulses become one and the performance seems to issue from a single mind of potent "group think" rather than from four separate players. When a pictured image (as in sports) or an

[5] "Flow" is here being used in its technical sense as understood in the psychological literature: "complete, timeless absorption in an activity." See Mihaly Csikiszentmihalyi, *Flow: The Psychology of Optimal Experience* (Harper & Row, 1990).

audiated image (as in music) is strong enough, it can almost will the favored outcome into existence. The goal of mental rehearsal in musical performance is to achieve such focused concentration.

"**Intuition**" is the mechanism that merges the two streams—internal and external—into one. Intuition impels, on the fly, the milli-second to milli-second micro-adjustments that permit the two versions of performance to exist "in sync." Because these rapid-fire adjustments seem to occur in a flash, I define intuition as "immediate knowing without the conscious application of reason or judgment"—knowing without knowing how we know.

The speed with which intuitive decisions can be made—and *must* be made in the real-time, semi-improvisational rush of actual performance—is truly astounding. This has given rise to the idea that intuition-based performance is the result of superficial or simple-minded "snap judgments." True as this may be, it is also deceptive. The apparently simple algorithms used for intuitive performance are based on a complicated preparatory methodology—a background of previously established expertise. This applied expertise only seems quick when measured in action by a stop watch; in reality it is months, years, and even decades in the making. Its complexity and refinement, both of which occur offstage, are what "snap" the judgment.[6] If asked, "How long have you been practicing for your recital?" the only appropriate answer is "All my life."

A musician's intuition, then, is not just an uninformed hunch. By this stage in my model (i.e., in the student's development), the mind has already been primed with the cumulative results of historical research, score description, probing analysis, and animated embodiment—all the stages that make imagery possible. Each prior stage feeds into the next. Imagery is a coordinated summary of knowledge, insights, and responses—a sumptuous and multi-layered supply base—that is passed on, like a baton in a relay race, to our intuitive capacities at the precise moment of performance.

By the way, the box-like compartments in the diagram are not discrete stages. To keep things visually tidy, there are many overlaps and bleed-throughs not pictured. Score study, analysis,

[6] For a fascinating view of the "snappiness" of intuition, see the recent bestseller: Malcolm Gladwell, *Blink: The Power of Thinking Without Thinking* (Little, Brown and Company, 2005).

and embodiment, for example, blur at their edges. After all, analysis is just another (more advanced) form of score study, while embodiment, in turn, is just another mode of analysis. And the relationship of imagery, mental rehearsal, and intuition is especially permeable and coalescent. The three are practically inseparable—like water from three connected lakes.

Two common confusions need to be addressed. First, intuition should be distinguished from "instinct," which refers to inborn patterns of response or behavior as opposed to learned behaviors. Instinct is biology driven; intuition is experience driven. Intuition is the inevitable emergent consequence of all our prior training, not something handed to us at birth. It is earned, not given. And it can be either abundant or threadbare. Training will tell.

Another deeper and more common misunderstanding, in discussions of musical performance, involves the so-called bipolarity of intuition and analysis. In my opinion, this is a myth. Analysis is not something to be pictured in opposition to intuition—for example, "reason" vs. "vague feelings" or "rational thinking" vs. "fuzzy thinking," as it is so often mistakenly characterized in the professional literature.[7] A corrective and more accurate view, though, has recently been incisively expressed by neuropsychologist Elkhonon Goldberg:

> Intuition is often understood as an antithesis to analytical decision-making, as something inherently nonanalytic or preanalytic. But in reality, intuition is the condensation of vast prior analytic experience; it is analysis compressed and crystallized. In effect, then, intuitive decision-making is postanalytic, rather than preanalytic or nonanalytic. It is the product of analytic processes being condensed to such a degree that its internal structure may elude even the person benefiting from it. . . . The intuitive decision-making of an expert bypasses orderly,

[7] For an example of this "opposition" view, see Wallace Berry, *Musical Structure and Performance* (Yale University Press, 1989), 7-8. Berry warns against using intuition as a "capricious guide" and offers analysis for its superior values of "logical reasoning and articulate expression." In fairness, he does speculate that intuition could be the "outcome of deeply assimilated experience conducive to spontaneous responses," but this idea, unfortunately, is immediately dropped and never heard from again.

> logical steps precisely because it is a condensation of extensive use of such orderly logical steps in the past. It is the luxury of mental economy conferred by vast prior experience.[8]

It's not a question, then, of "analysis vs. intuition" but rather how analysis interacts with intuition—how it informs intuition. The true relationship of the two is complementary, not adversarial—"both/and," not "either/or." This necessary and more up-to-date position has immense implications for understanding the value (and limitations) of theoretical training and its ongoing ripple effect throughout a musician's life.

It is helpful to distinguish between "declarative knowledge," which can be displayed by writing or speaking—like the fact that Haydn and George Washington were born in the same year—and "procedural knowledge," which can only be demonstrated by activity—like riding a bicycle. Declarative knowledge is explicit, readily verbalized, and rapidly acquired (as in learning to write triads). Procedural knowledge, on the other hand, is implicit, hard to verbalize, and slowly acquired (as in performing music).[9]

Converting the declarative to the procedural can be learned. What starts out as a conscious step-by-step application of the rules eventually becomes automatic and internalized—as in spelling our name. What once had to be learned as a tedious exercise eventually becomes spontaneously reproducible and intuitive. The results of analysis can later pour forth as a sixth sense, as second nature during performance. Some call it "blood memory." This implicit memory can affect our behavior without conscious awareness. What is remembered was conscious when it was first learned but is not so when it is later used.[10] Over time, these memories become almost as deeply embedded in our thinking habits as our fingerprints or even our DNA.

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[8] Elkhonon Goldberg, *The Wisdom Paradox* (Gotham Books, 2005), 149-152.

[9] W. Jay Dowling, "Procedural and Declarative Knowledge in Music Cognition and Education," in *Psychology and Music: The Understanding of Melody and Rhythm*, ed. Thomas J. Tighe and W. Jay Dowling (Lawrence Erlbaum Associates, 1993), 5-18.

[10] See John Kihlstrom, "The Cognitive Unconscious," *Science* 237 (1987): 1445-1452.

This view is supported by Goldberg's brain-imaging research. The right hemisphere (favoring novelty and initial learning) is activated when an individual is in the early stages of acquiring a new cognitive skill but as that task is mastered, the left brain (favoring long-term repositories of established mental routines) takes over:

> The right-to-left transfer could also be demonstrated for various real-life professional skills, which take years to acquire. Novices performing the tasks requiring such skills showed clear right-hemisphere activation. But skilled professionals showed distinct left-hemisphere activation while performing the same tasks. Music is a good example. When musically untrained individuals (like most of us) were asked to recognize melodies, the right hemisphere did a better job and was particularly active. But in professionally trained musicians the opposite was true: The left hemisphere did a better job and was particularly active.[11]

According to this view, then, and as applied to my chart, early-stage musical analysis is more closely associated with the right brain and later-stage intuition with the left. And more important, a transfer between the two is possible. This transfer is one aspect of what has recently been called the *neuroplasticity* of the brain.[12]

Imagine two bird watchers, one experienced, one a beginner. The experienced one catches a glimpse of a large yellowish bird flickering overhead and instantly calls out "evening grosbeak." Meanwhile, the novice frantically flips through a field guide, shuttling between pages of yellow birds, birds with crowned heads, birds with large silhouettes, birds that undulate while flying. The experienced bird watcher has amalgamated all that data and internalized a signature pattern, while the novice must rely on an external device—the field

[11] Goldberg, 204-205.

[12] See Sharon Begley, *Train Your Mind, Change Your Brain* (Ballantine Books, 2007); and Ian H. Robertson, *Mind Sculpture: Unlocking Your Brain's Untapped Potential* (Fromm International, 2000). These two books report on some amazing psychological experiments that document how mental rehearsal can affect musical performance.

guide—which can only provide information, not synthesis, and inefficiently at that. Experienced bird watchers respond quickly because they rely on the accumulated wisdom of intuition.

Like the bird watcher, the performer should first build up the declarative knowledge bases of history, analysis, and so forth—i.e., their musical "field guide" should be studied—and then move gradually toward a more procedural approach. In fact, once learned, all factual knowledge should be set aside, left off the performance platform. While performing, all thinking—all conscious rational decision-making—should be abandoned. Do as much analysis as you can, then forget about it—throw away the field guide. It will continue to influence one's actions from behind the scenes. Tracings of analysis and data-related work will linger as part of the deeper stockpile of accumulated memories like visible tracings left on ice by skaters. Not only the tracings of current recital pieces but the residual tracings of all pieces ever played, studied, or heard are stashed away for subtle influence and indirect recall. This operates as a massive emotional and expressive library stored in dormancy. Composer John Adams calls this his "garbage heap" (all the music he has ever heard since childhood including songs from the crib, TV commercials, and Elvis Presley)—his "idea bank" for writing new music, in his case, or one's aural stockpile in my performance context.

The concept of *stockpile* as stored experience, *not* facts about music, is the ground of intuition.[13] Most great performers play from the tacit and latent bedrock of a generalized intuition, not from consciously recalled knowledge about specific pieces. If the goal of analysis is to sensitize the cognitive ear and refine the aural imagination, as Leonard Meyer has suggested,[14] then analysis of any similar group of pieces would be as useful as analysis of the ones currently being practiced. One cannot easily perform from a recipe, from a set of programmed instructions, or directly from declarative knowledge, as derived from analysis, just as a centipede cannot walk smoothly by thinking about moving each individual leg. One cannot perform with natural, musical fluidity from a consciously remembered, planned interpretation for the same reason that one cannot dance

[13] For a penetrating and original theory of human consciousness and provocative discussion of how the mind establishes and draws upon stockpiles of previous experience, see Douglas Hofstadter, *I Am a Strange Loop* (Basic Books, 2007).

[14] Leonard Meyer, *Explaining Music* (University of Chicago Press, 1973), 17.

gracefully from painted footprints on the floor. As more than one sage has proclaimed, this would amount to "paralysis by analysis." In a sense, intuition simplifies or screens out the stultifying clutter of analysis—the infamous "too-much-information" problem of our age—while, at the same time, drawing strength from it. One might say intuition purifies analysis.

The concept of "just listening" is useful here. The double meaning and play on words is intentional. I mean the term "just" in the sense of *merely* or *only* listening and also in the sense of *genuine* or *authentic* listening, as opposed to the kind of analytical listening that is so often done in academic settings. *Just listening* cannot result by adding outside consideration to the consciousness of the sounds—descriptive, historical, technical, theoretical, or cultural—although conscious verbal knowledge is a valid initial step in getting to the intuitive stage. Just listening can be looped back into our larger stockpile of total life experience that, in turn, reinvigorates the whole cycle. And by analogy we can call intuitive performance "just playing"—playing free from the inhibiting influence of conscious analytical thought. [See the chart.]

To "just play" requires listening without presupposing, classifying, controverting, evaluating, approving, or disapproving—listening that is not dueling with what is being performed. The beady eye of the conscious self is there during analysis but not during the performance proper. Appropriate training develops automatic skills that can be applied without the need for awareness that they are being so used.[15]

Artistic performance demands the paradox of "wild purity" or "controlled mania"—a mixture of reckless abandon and care. The goal is to incorporate both the methodical mindfulness of analysis

[15] Tor Norrestranders, *The User Illusion: Cutting Consciousness Down to Size*, trans. Jonathan Sydenham (Viking, 1998), 264.

and the vetoless flow of intuition in music making. As Friedrich Schlegel has said (in *Athenaeum Fragments*): "It is equally fatal to have a system and not to have a system. One must combine them." Pianist Russell Sherman has especially persuasively articulated this idea:

> The spontaneity of Artur Schnabel or Thelonius Monk does not flow from unrehearsed consciousness, or because they never thought about things. It flows because they thought about things so hard and honestly that they were attuned to the puzzles and contradictions which demand a leap of faith, or play. Only from a thorough preparation which teaches all and the limitations of all can the conditions arise for inspired "accidents." Only the anguish and amusements of hard work can train one to perceive the charms of chaos, the dynamics of its properties and improprieties.[16]

"**Inspired accidents**" can only happen from nurtured, well-prepared discipline and perseverance. The "inspiration" portion of the duality is not carried by a sunbeam from the sky but issues from the rigorous foundational spadework that makes intuition possible. The "accidents" portion represents "what happens"—the byproduct of spontaneous invention. Working easy at the end only follows from working hard at the beginning.

There are no shortcuts, then, for learning how to perform music well. And even though I have mainly been focusing on performance in my discussion, I just as well could have substituted the word "listener" for "performer" (as I have actually done several times already) or substituted the more general word "musician" or "theory student." I'm thinking of performance, in other words,

[16] Russell Sherman, *Piano Pieces* (Farrar, Straus and Giroux, 1996), 29. This is perhaps the single most profound and human book on musical performance yet written—a real work of life-enhancing philosophy, not just practical advice. Every page is filled with stunning insights. I wanted to underline practically all of it. It is dense and best read in small doses (with frequent pauses for pondering) since it will constantly stir one's thinking and subtly challenge one's stereotyped and humdrum presuppositions about how music-making really works.

not just as playing an instrument or singing but in the broadest possible sense of "activated musicianship." Progress in all realms of musicianship is always the result of dedication, a wise and meticulous pedagogical framework, and a commitment to artistic excellence and mastery on the highest level. Mastery on the highest level means that theoretical learning—maybe I should call it "just learning"— has been so completely internalized that music making or listening becomes the natural and elastic extension of a stockpile of musical experience. Performance and listening should flow from the student as freely as sap flows from a tree. The promise of music theory pedagogy is to provide just such experience, and the goal, seen in this light, becomes *intuition enrichment*.

Similar ideas about the value of intuition-drenched musicianship have also been forcefully stated by others. By way of summary, I offer a brief survey of increasingly concise versions.

Benjamin Britten:

> "After the intellect has finished work, the instinct [he should have said "intuition"] must take over. In performance the analysis should be forgotten and the pieces played as if they were at that moment being composed."

Pierre Boulez:

> "In a paradoxical way, you become more spontaneous when you know more."

Suzuki Daisetz (a Zen Master):

> "One has not understood until one has forgotten it."

Basho (the 17th-century Japanese poet):

> "Learn the rules, then forget them."

Pierre Boulez:

> "Intuition is memory."

And the winner for brevity is Leonard Bernstein's pithy comment on performance:

> "It's all jazz."

In the end, imagery spills out of its bountiful content of conceptual, cognitive, emotive, and corporeal meanings into the reservoir of intuition, by way of practice. All three, in synergistic combination, provide an unassailable coupling between our mental life and sounded music. Under such conditions, as T.S. Eliot has so eloquently stated, music is "heard so deeply that it is not heard at all, but you are the music while the music lasts."

Listen Up!: Thoughts on iPods, Sonata Form, and Analysis without Score

Brian Alegant

Introduction

In a recent textbook Gary S. Karpinski summarizes two kinds of activities that have proven useful for developing listeners' skills in attending to form.[1] One activity involves listening guidelines (or questions to be answered in prose); the other uses some kind of visual representation. Both have the potential to highlight features of a work that will become clearer through repeated listening. Karpinski makes three assertions about developing listening skills: first, that students should focus on the recurrence of motivic and thematic materials, textural changes, harmonic instability, and key areas; second, that students need to listen *repeatedly*; and third, that the skills gained through acquiring "intimacy with even only a handful of works" can be transferred to unfamiliar repertoire.

This essay summarizes a pedagogical approach that uses iPods to teach students to analyze sonata forms without score.[2] It discusses the advantages of iPods and outlines the organization of the course, paying particular attention to the learning outcomes and the roles played by graduated assignments. My primary aims are to stimulate thought about the topic of analysis without score, and to suggest that it is both possible and rewarding to teach this particular skill. The strategies I advocate resonate strongly with Karpinski's three assertions above, namely an emphasis on close readings of a handful of works in order to develop specific skills that can be generalized; the use of various kinds of visual representations (ranging from virtually blank scores to highly annotated ones); and an ideal device for repeated listening—the iPod.

An earlier version of this essay was read at the annual College Music Symposium conference held in San Antonio, Texas in 2006. I would like to thank my colleague Jan Miyake for her valuable feedback.

[1] Karpinski, *Aural Skills Acquisition*, 2000, pp. 136–137; emphasis his

[2] While there are many writings on sonata form and aural skills pedagogy, to my knowledge none deal in any depth with the topic of teaching sonata form without score.

The course in question was Music Theory III, the third semester of a two-year sequence required of our undergraduate music majors.[3] I divided the course into two units, one on 19th-century song and the other on sonata form. The harmonic vocabulary included the standard items found at the end of most tonal-music textbooks: chromatic sequences, Neapolitans and augmented sixths, common-tone (embellishing) chords, advanced mixture, enharmonic reinterpretation, and symmetrical divisions of the octave into major and minor thirds.[4] These items were introduced through repertoire, and reinforced through analysis and part-writing assignments.

The main objectives of the sonata-form module were to provide students with the skills to acquire a non-trivial understanding of movements without score and to develop their ability to analyze in "real time." By the end of the unit students were expected to hear the formal divisions and subdivisions of a sonata form (ideally, in real time); recognize vocabulary items and the large-scale harmonic structure; and identify and write convincingly about "marked" features.[5] They also were expected to apply these skills to unfamiliar repertoire.

I began the unit by analyzing several sonata-form movements *with* score. Once students understood the small-scale and large-scale events, they listened to the works *without* score until they could recognize and identify (in real time) the analytical details. Gradually the movements became longer and more complicated, as formally transparent piano sonatas gave way to increasingly chromatic and formally ambiguous works for ensemble and orchestra. At the same time the assignments became increasingly difficult: the first few assignments provided many hints; subsequent ones contained fewer hints; and the final ones provided no hints at all. Overall, the syllabus unfolded this way:

[3] Theory III is the third and last tonal course in our "fundamentals" curriculum; Theory IV is devoted to post-tonal, atonal, and twelve-tone music. Students also take zero, one, or two upper-division electives, depending on their specific degree program. Throughout the curriculum the theory courses are linked with aural skills courses that stress similar content and skills.

[4] Such as Aldwell and Schachter, *Harmony and Voice Leading,* 2002; Kostka and Payne, *Tonal Harmony,* 2004; Laitz, *The Complete Musician,* 2003.

[5] I borrow the term "marked" from Hatten, *Musical Meaning in Beethoven* (1994), and *Interpreting Musical Gestures* (2004).

Weeks 1 and 2: Listening with score to major-mode sonatas; vocabulary
Week 3: Major-mode sonatas with visual aids
Week 4: Minor-mode sonatas with visual aids
Week 5: Development sections, with and without visual aids
Weeks 6 and 7: Consolidation: listening without any visual aids

The iPods proved to be tremendous assets. Every student received a 20-GB iPod for the duration of the semester. Each iPod contained everything needed for the course: syllabus, handouts, assignments, analytical reductions, articles, recordings, and scores.[6] Students thus had immediate and unlimited access to materials; when listening they could pause, rewind, fast-forward, and repeat as often as needed. (A built-in timer allows a user to identify events to the level of the second—so that it is possible to pinpoint, say, an augmented sixth in the key of the submediant precisely at 4'33".) I used the iPods to store and catalog hundreds of sound files, thereby facilitating both inside- and outside-of-class listening.[7] A final bonus: since the iPods were collected at the end of the semester, copyright permission for recordings became a non-issue.

There were some disadvantages to using iPods, too. Creating a master play list was quite time consuming, since it involved

[6] While one can also store these files on ERES or Blackboard, I found it much easier to move multiple files to iPods than to upload them to a remote server. Moreover, ERES and Blackboard accounts have space limitations and tend to be slow during periods of heavy use. I also found it best to store scores as pdf files and to store sound recordings as mp3 files (on our server, mp3 files—while not ideal sonically—are more reliable than AAC and require much less space than WAV files). In case readers are wondering about the logistics: each student signed a "contract" at the beginning of the unit stating that he or she would be charged the replacement cost of the iPod if it were lost, stolen, or damaged. All iPods were returned, in working condition, at the end of the semester.

[7] I found it useful to construct individual play lists containing multiple performances. For instance, I had nearly a dozen different interpretations of the first movement of Beethoven's "Ghost" Trio (op. 70, no. 1), and multiple performances of the fourth movement of Schubert's posthumous A-major piano sonata (D. 959). I then crafted assignments that asked students to evaluate different interpretations through various lenses or analytical filters. iPods are much better suited for such comparative listening than swapping CDs or downloading files from a remote source.

importing and classifying files, standardizing play lists, and transferring the playlists to the individual iPods.[8] And the devices are not cheap: a 20-GB iPod at the time was $260. (One can now purchase a 30-GB video iPod for the same price.) Certainly, some institutional backing is required, such as an internal grant. I received funding for 22 iPods, one for each student, one for me, and one reserved for an emergency. Since then I have "recycled" the iPods from one class to the next.

Are iPods necessary to teach students how to listen without score? In a word: no. Students could always listen the "old-fashioned" way—by visiting the library. Or they could connect remotely to a course management system like Blackboard or another electronic reserve platform. Nevertheless, students took full advantage of the iPods' portability and versatility. They listened significantly more with iPods than previous classes did without them; indeed, they reported an average of six hours per week of listening to material related to the class (and, presumably, additional time listening to other music). This amount of listening resulted in a substantial engagement with the subject matter and deeper learning.

A FEW WORDS ON SONATA FORM

I will assume that readers are conversant with the principles of sonata form, and comfortable with some analytical approach or system (such as Caplin, Green, Hepokoski and Darcy, Ratner, or Rosen).[9] The terminology used here is based on the sonata theory of Hepokoski and Darcy. Theirs is a detailed and complicated genre-based approach to sonata form, one that places a premium on the notion of areas, or zones. My purpose here is not to rehearse its intricacies but rather to familiarize readers with its terminology.

[8] I spent a considerable amount of time, for instance, standardizing the names of composers, works, and movements—in large part because students had difficulty finding movements if the key words were not coded in a similar fashion. Thus, I chose the tag "Mozart" instead of "Mozart, Wolfgang," or "Amadeus, Wolfgang Mozart," or "Mozart, W. A," etc. All in all, I estimate that it took about 50–60 hours to compile the playlists. While this start-up cost is daunting, it is a one-time expenditure: the playlist can now be instantly retrieved and easily amended.

[9] See for instance Caplin, *Classical Form,* 1998; Hepokoski and Darcy, "The Medial Caesura," 1997, and *Elements of Sonata Theory,* 2006; Ratner, *Classic Music*, 1980; Green, *Form in Tonal Music,* 1979; and Rosen, *The Classical Style*, 1997.

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Exposition                Development //  Recapitulation  (Coda)
|| P — Tr      S — Cl  || (stages)  Rt   P — Tr      S — Cl       ||
       MC         EEC                          MC       ESC
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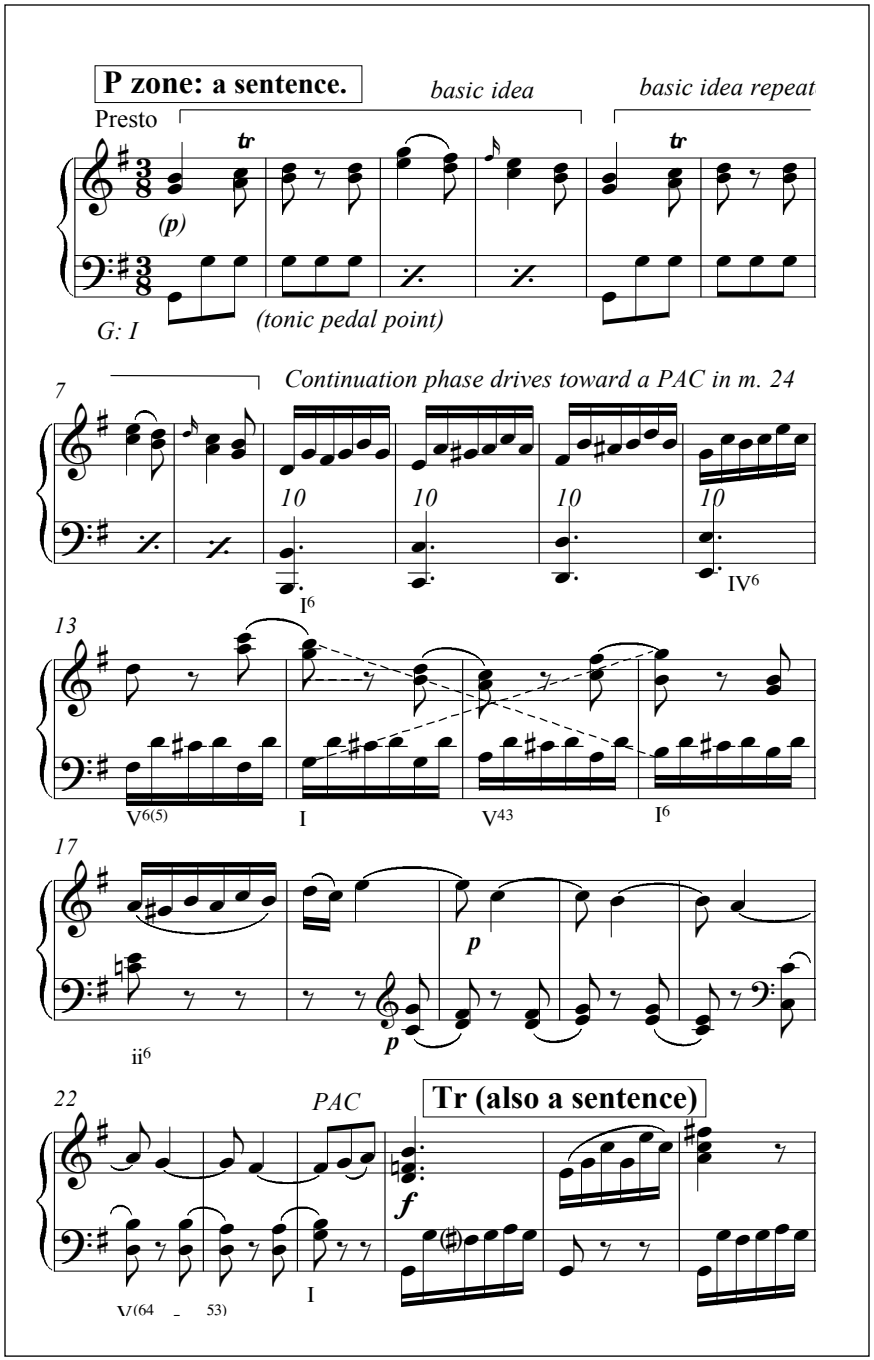
P = primary zone
Tr = transition (functions primarily to increase tension)
MC = medial caesura (the dividing point in most expositions)
S = secondary zone (may contain multiple components, which are labeled S1, S2, etc.)
Cl = closing zone (commensurate with the onset of EEC and ESC)
EEC = essential exposition closure (the definitive authentic cadence in the exposition)
Rt = retransition
ESC = essential structural closure (corresponds to EEC in the exposition)

Example 1. A typical sonata form with a two-part exposition.

Example 1 models a prototypical sonata form, with labels and abbreviations for what Hepokoski and Darcy refer to as a two-part exposition.[10] The first half of this type of exposition contains the Primary zone (P) and the transition zone (Tr); the second half contains the Secondary zone (S) and the Closing zone (Cl). The medial caesura (MC), a significant rhetorical device, bifurcates the exposition. The signal event of the exposition is the definitive arrival of a perfect authentic cadence (PAC) in a non-tonic key (most often V in major keys and III in minor keys). By definition, this PAC marks the essential expositional closure (EEC), which is commensurate with and initiates the closing zone. The corresponding event in the recapitulation is the essential structural closure (ESC), which ushers in the closing zone of the recapitulation. A coda may follow (although many early sonatas lack codas).

[10] By standard I mean the normative two-part exposition, as discussed in Hepokoski and Darcy 1997 and 2006. Of course, readers know that there is no such thing as a universal or definitive model of a sonata form.



Example 2: Mozart, Piano Sonata in G major, K. 283, iii.

A SAMPLE ANALYSIS

I began the unit with the third movement of Mozart's Piano Sonata in G major, K. 283, iii.[11] Example 2 provides an annotated score of the exposition. The score outlines the large-scale formal design and offers a few observations on phrase structure, chromaticism, and voice-leading details.[12] In my experience, the analytical annotations match what most sophomores can reasonably apprehend in a single class. One advantage of the movement is its formal transparency: the exposition, development, and recapitulation are relatively straightforward. At the same time, it contains some interesting harmonic wrinkles, including modal mixture, augmented sixths, and applied chords.

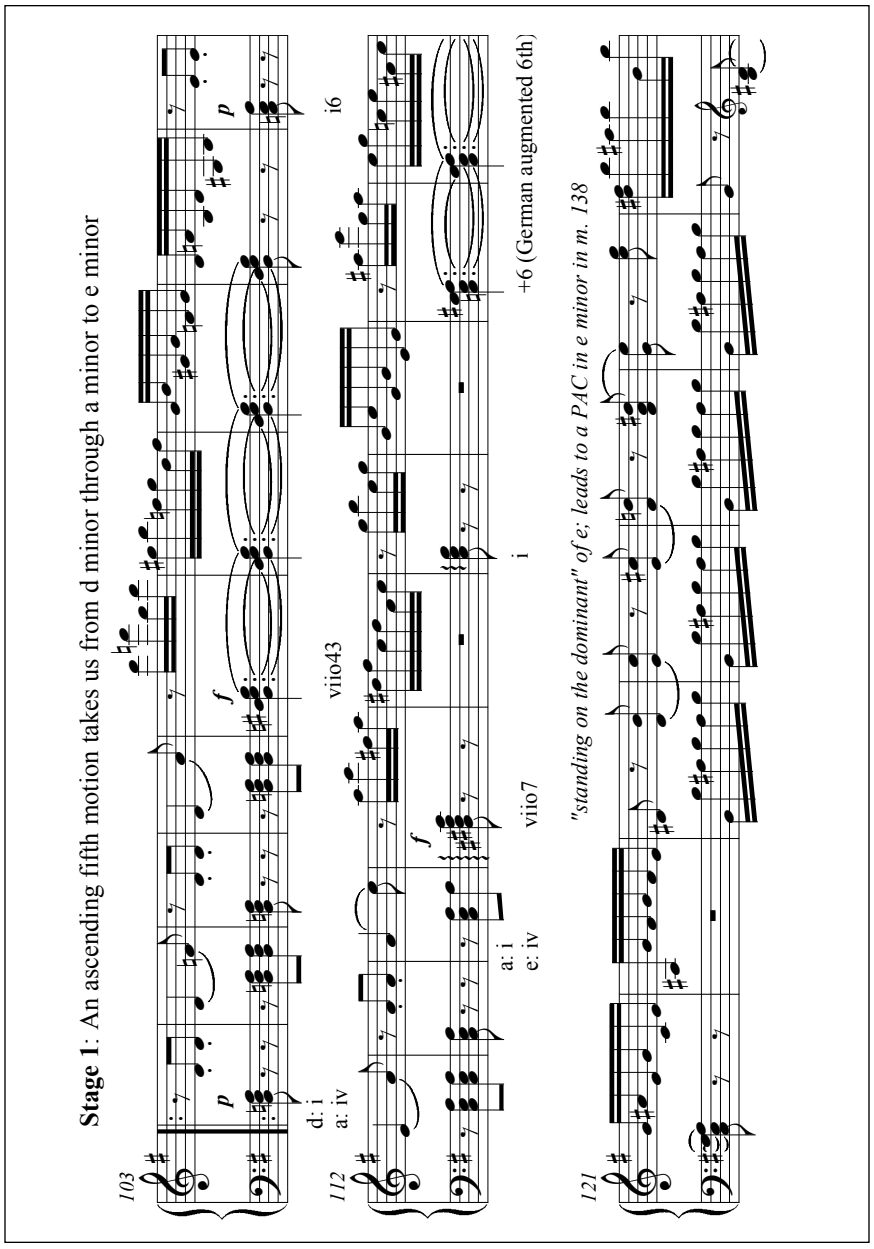
The P zone of the exposition unfolds a sentence, with a clear-cut presentation phase that includes a four-bar basic idea and its repetition. A four-bar hypermeter is immediately established; this hypermeter governs nearly the entire movement.[13] The continuation phase of the sentence (mm. 9–24) changes figuration and character. It features an ascending bass line (mm. 9–16) that extends I6 harmony, an expansion of ii6 (mm. 17–21), and a cadential-6/4 that leads to a PAC (mm. 22–24). The latter portion of the continuation is characterized by syncopation and rhythmic instability. The transition (mm. 25–40) immediately reasserts a sense of squareness. It touches on the subdominant (IV), moves through a fleeting C♯ (m. 28), and lands on V, which I hear as a half-cadence in G. The MC (medial caesura) encompasses the two eighth-note rests, which release the energy built up during the transition. The S zone is twice as expansive as the P zone. It is also structured as a sentence, with an eight-measure basic idea (mm. 41–48), its repetition (mm. 49–56), and a sixteen-bar continuation (mm. 57–73). The PAC in the key of the dominant (m. 73) marks the EEC and initiates the Cl zone.[14]

[11] Another ideal choice is the anthologized first movement of K. 333.

[12] Such chromatic events include the telling $C\sharp_4$ in m. 38, which points to V, and the fleeting instances of $B\flat_4$ in mm. 65–68, which invoke modal mixture and foreshadow the inflection to d minor with which the development begins.

[13] Early writings on hypermeter and its analytical implications include Rothstein, *Rhythm and the Theory of Structural Levels*, 1981, and *Phrase Rhythm in Tonal Music*, 1989; and Schachter, "Rhythm and Linear Analysis," 1987.

[14] One could argue that m. 97 and not m. 73 is the EEC, in which case the C1 zone in Example 2 would function as S2. This is a good talking point in class. I prefer the former reading, in large part owing to the trill.



Example 3: Development Section of K. 283, iii

The Closing zone houses an eight-measure chromatic phrase (mm. 74–81) and a varied repetition of this phrase subject to invertible counterpoint (mm. 82–97). "Rocket" gestures (mm. 89–92) initiate a cadential flourish (mm. 93–96) followed by another V:

PAC (m. 97). The C2 zone contains a four-measure chromatic idea (which is subsequently exploited in the development) and a two-measure cadential gesture that reaffirms, for the third and last time, a PAC in the key of the dominant.

The development section is shown in Example 3.[15] I divide it into three stages based on motivic content, cadences, and changes in figuration, dynamics, register, and texture. (Parsing the development into autonomous "chunks" makes it easier for students to model the character shifts and large-scale harmonic organization.) Stage 1 unfolds a series of four-measure groupings. It begins on d minor

Exposition		
P	0:00; 1:01	sentence: 4 + 4 + 8 measures
Tr	0:14; 1:15	
MC	0:23; 1:25	I: HC
S	0:24; 1:26	also a sentence, but longer
C1	0:43; 1:44	beginning of closing = EEC repeated w/invertible cpt.
C2	0:58; 1:59	another confirming PAC begins in d (v), modulates
Development		
	2:13	a *forte* +6th chord in e minor
	2:23	PAC in e minor (vi)
	2:24	Rt (back to V)
Recapitulation		
P	2:40	return to tonic and opening tune
Tr	2:59	
MC	3:09	
S	3:10	
C1	3:28	*ESC*: essential structural closure

Example 4. A sample early assignment: Mozart, K. 283, iii

[15] In the interest of space I shall gloss over many analytical details, including the establishment of a four-bar hypermeter, the expansion of subsections, and several "extra" measures; the specific derivation of thematic material (most of which is taken from the transition zone and the cadential gesture at the end of the exposition; the absence of P and especially S zone material is intriguing); and the references in mm. 159–66 to the B♭ near the end of the closing zone of the exposition.

(mm. 103–06), touches on a first-inversion a-minor chord (m. 111), and travels another fifth "sharpwise" in the direction of e minor (vi). The pull to e minor is enhanced by an augmented sixth (mm. 119–22) and an extended dominant expansion (mm. 123–31). There follows a brief detour (mm. 132–33), a re-gathering of momentum, and a conclusive PAC (m. 138). Stage 2 is fragmented and saturated by p–f juxtapositions and cadential gestures that allude to other keys. Stage 3 occupies the retransition, which interestingly enough lacks a strongly asserted C♮ (the 7th of V7).

The central issues of the recapitulation concern subtle changes in the P and Tr zones, the (mostly literal) transposition of material in the S and Cl zones, and the presence of a perfunctory coda.

Listening with score, consolidating with visual aids

Once students understood the basic principles of sonata form and the characteristic features of this movement, I used visual aids to consolidate the analysis and help them internalize small-scale and large-scale features. To illustrate, Example 4 (preceding page) represents a timeline or flowchart for the movement.

The assignment asked students to provide times for the main formal divisions and harmonic arrival points. It also reinforced many of the analytical details that were addressed in class.[16] I included a brief summary of the exposition at the top of the assignment, as a reminder of the large-scale structure; I am stating it below in the text rather than crowd the example. It read: The P zone is a sentence; you can conduct it (and nearly all of the movement) in a four-bar hypermeter. The move from to the Tr is somewhat tricky. The Tr zone begins at 0:14, with a change in figuration, and moves from the tonic to the dominant. The *medial caesura* (MC) is the noticeable break in the texture at 0:24. The S zone is also a sentence, but the basic idea and its repetition are *eight* measures apiece; the continuation is also expansive. The PAC in the dominant at 0:44 is the *EEC*, or essential exposition closure. This, the defining event in the exposition, asserts the new key area with a PAC.

[16] The actual assignment did not provide the times; they are included for reference. These times match the performance by Ivo Pogorelich on Deutsche Grammophon 437762–2. His quirky, extroverted, and unconventional performance contrasts strikingly with the interpretations of Mitsuko Uchida (Philips 412 122–2) and Malcolm Bilson (Hungaroton HCD 31010). Such differences lead to lively discussions and provocative essays or reaction papers. I should add that students were on their honor not to use score to complete the assignment.

The first two weeks proceeded in this fashion: students analyzed major-mode sonata movements with score until they reached a satisfactory level of understanding, then reinforced their understand by listening to visual aids. A few students struggled with this step; soon, however, everyone was up to speed. (There were, of course, widely varying degrees of success in identifying voice-leading

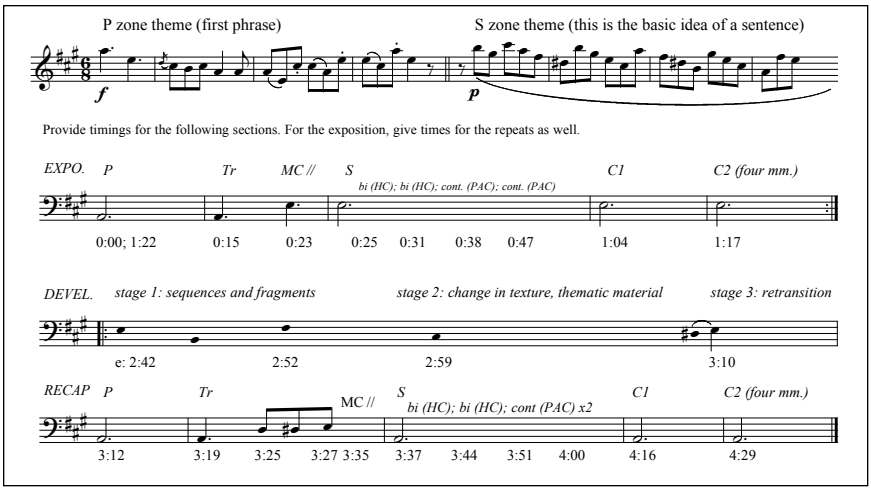
Listen to the movement several times *without score*, and enter times for the formal divisions at the spots indicated below. When finished, check your work by studying the movement *with score*.

Exposition		
P	0:00; 1:29	sentence; *ff* summary 0:20, 1:49
Tr	0:28; 1:58	wanders, moves to V of III
MC	0:42; 2:11	V of III extended
S	0:51; 2:19	sentence; III
EEC/C	1:18; 2:28	
Development		
Pre-core	2:59	begins in I (!)
Core	3:10	moves to iv (f minor)
Rt	3:43	standing on V
Recapitulation		
P	3:51	sudden *ff*; sentence
Tr	4:14	note: a flat key
MC	4:28	V of iv/IV
S	4:35	IV (F major!)
	4:48	corrected to i; *sub. f*
ESC/C	5:17	
Coda	5:26	just two measures

* * *

Also: Write one paragraph on unusual features of the S zone in the recapitulation, and two paragraphs on hypermetric irregularities. Indicate the precise times of these passages.

Example 5. Beethoven, Sonata op. 10, no. 1, i



Example 6: Mozart, Sonata in A major for violin and piano K. 305, i

details, chords, sequences, progressions, and modulation schemes.) In week three I introduced minor-mode sonatas, with score. Example 5 is a filled-in version of an assignment that summarized the salient features of the first movement of Beethoven's piano sonata in C minor, op. 10, no. 1.[17]

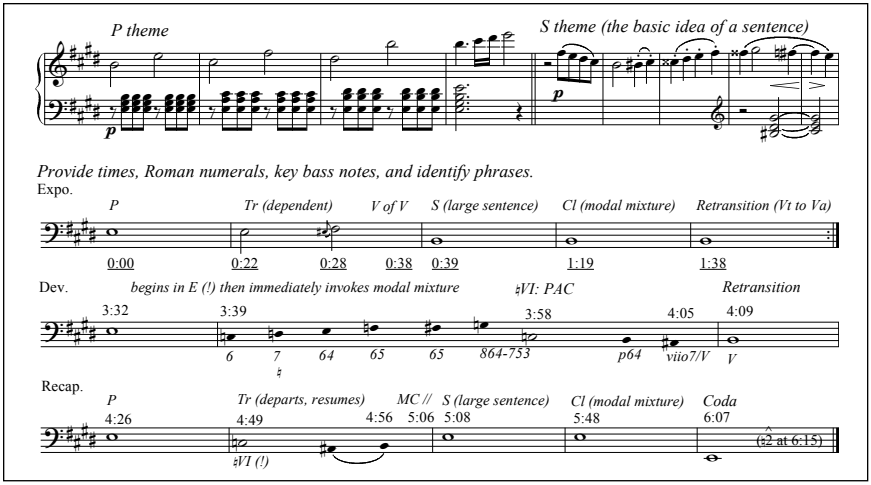
Listening without score, but with visual aids

By the end of three weeks students were relatively comfortable listening without score. Thus, the subsequent assignments provided fewer crutches and signposts. At first they were asked to interpret movements without score, but with profiles of the P and S themes and a sketched-out template of the form. To illustrate, Example 6 was designed for the first movement of Mozart's sonata for violin and piano, K. 305.[18]

Example 7 was designed for the first movement of Beethoven's piano sonata in E major, op. 14, no. 1. It gives the broad outlines of the exposition and recapitulation (the skeleton of P, Tr, S, and Cl), plus selected bass notes and figured-bass symbols in the development. Students were asked to fill in the remaining materials. Students found these types of assignments challenging but manageable.

[17] This particular assignment did not provide times, and gave only a few hints in the far column. The times shown correspond to Richard Goode's performance on Elektra Nonesuch 79213–2.

[18] Times correspond to the performance by David Breitman (fortepiano) and Jean-François Rivest (violin) on Analekta AN 29821–2.

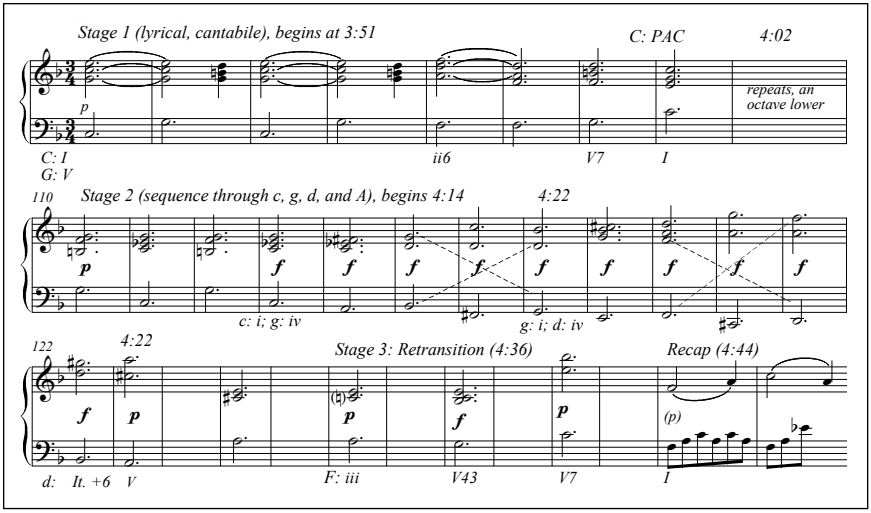


Example 7: Beethoven, op. 14, no. 1, i

I would like to make one brief note about the assignments. The first time I taught the course I assigned Examples 4 and 5 early on in module; students were still finding their way. Thus, I gave all of the information on the page except the timings; this was the only information students were asked to provide. One could—with more advanced classes, or at a later point in the semester—remove some or all of the hints in the right-hand margin. One could also remove some or all of the structural signposts to provide less of a scaffold for students. The point is that there are many possible variations and degrees of difficulty. In a similar vein, Examples 6 and 7 provided nearly all of the information shown save the timings. Here, too, one could selectively remove some or all of the bass notes, formal markers, or hints.[19]

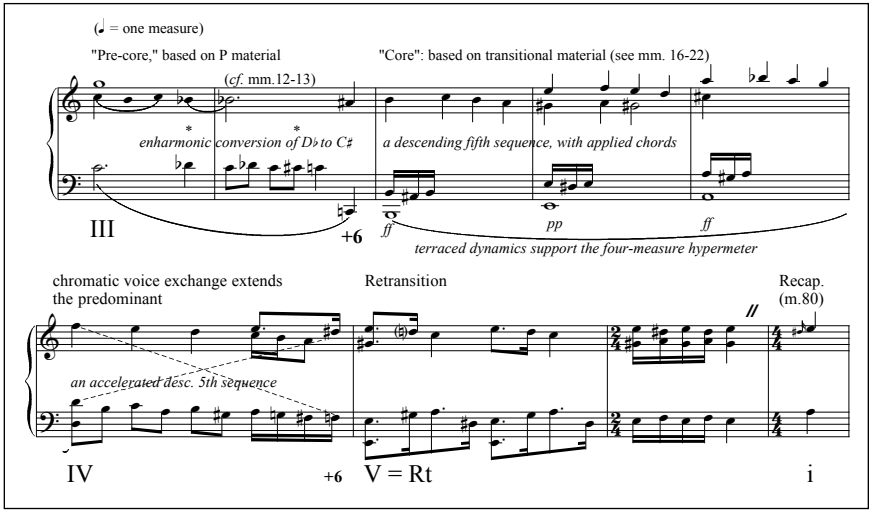
Soon, most students were able to ascertain the basic structure and the large-scale harmonic plan of a sonata form movement in two hearings. I then devised assignments that focused on specific passages: chromatic sequences, unusual progressions, mixture, or entire development sections or subsections. I spent a fair amount of time on development sections because they tend to give students

[19] For example, I gave these pointers for the Mozart: (1) in the exposition, the P zone is repeated twice; (2) the S zone begins as a parallel period (antecedent with a HC, then what would seem to be a consequent); however, its would-be consequent also ends with a HC, effectively turning the S zone into an extended sentence; (3) as a result, the closing zone does not begin at 0:45—the continuation phase of the sentence is immediately repeated, extending the S zone and delaying the Closing zone (and EEC).



Example 8: Development section for Mozart, K. 332, i

trouble—no doubt due to their harmonic instability (rapid and distant modulations and highly figured sequences). I found the timer feature of the iPod to be inordinately helpful: I could merely ask students to notate in the key of A major the passage from 3:15 to 3:32. To illustrate, Example 8 is a worksheet designed to help



Example 9: Mozart, K. 310, i. "Road map" of the development, shown as a rhythmic reduction.

students come to grips with the development section of Mozart's piano sonata in F, K. 332, i.[20]

Briefly, I parse the development section of the first movement of K. 332 into three discrete stages. The first stage cadences in C major; the second stage initiates a large-scale fifth ascent that travels from c minor to A major, which I read as the dominant of d minor; the third stage is the retransition, which inflects or "corrects" C♯ to C and eases into V43 and V7 of F. This assignment, too, could receive variation, such as the following: reinforce the learning that occurred during class by asking students to supply timings; require students to identify the stages and the bass notes by providing Roman numerals and notating a chordal reduction of the retransition; or require students to sketch the entire development, using any means or symbols appropriate.

Example 9 (see preceding page) provides a road map of another development section. This is the first movement of Mozart's sonata in a minor, K. 310, a quintessential illustration of a minor-mode III—iv—V development. The upper portion of the example is a rhythmic reduction that uses quarter notes to represent full measures. This development also divides into three stages: a "pre-core" that begins on III; a "core" that uses a descending fifth sequence to lead to iv; and a retransition that is ushered in by an augmented sixth.[21] The example also includes a few details on surface features. These observations are placed into a broader context in the "satellite view" in part II of the example. One intriguing issue concerns the dyads A♯–B and especially D♯–E, the latter of which plays a vital role in the sonata.[22]

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[20] Some of the registers have been normalized, and timings are for Andreas Staier's performance (Harmonia Mundi, HMC 901856). For purposes of space I have not included the score.

[21] The terms "pre-core" and "core" are drawn from Caplin 1998.

[22] It would be a worthwhile exercise to "trace the history" of D♯ (and its enharmonic equivalent E♭) throughout the movement. D♯ is in fact the first melodic note we hear (it is strikingly asserted as the chromatic lower-neighbor of E5). Throughout the movement it appears frequently as a chromatic lower-neighbor to E (see mm. 9, 11, 14, 80, 98–99, 107–08, 110, 113, 115–117), as a chromatic passing note to E (such as m. 7), as a "agent" of modal mixture (re-spelled as E♭ it colors mm. 16–21 of the transition), and as the bass note of the rhetorically-charged viio7/V (m.127) in the final cadential flourish that begins in m. 118. B♭ admittedly plays a smaller role: the conversion of B♭ to A♯ in the development section initiates the core of the development, and B♭ is highlighted in the Neapolitan chords in mm. 109 and 119.

|| P	—	Tr	(MC) //	S	—	EEC /	Cl	:||
(1)		(2)	(3)	(4)		(5)	(6)	

(1) The phrase structure of the P zone (frequently a sentence or period)

(2) The cadence at the end of the P zone, and the point of departure for Tr

(3) The harmonic context for the MC—and the point of departure for S
(is it half-cadence in tonic? A PAC in the dominant?
Another possibility?)

(4) The phrase structure of S, and its subsections (if any)

(5) The precise onset of EEC

Example 10 - Taking inventory: a checklist of the exposition.

Listening without score

Once students were comfortable—or, at least, less uncomfortable—with the challenges imposed by development sections, they were ready to tackle full movements without a score or visual aids. To foster this goal I devoted several classes to listening (without score) to several expositions. Students were asked to trace six events in each exposition—to take aural inventory of the harmonic and rhetorical structure. These are summarized in Example 10. I also instructed them to listen for other features, such as topics,[23] modal mixture, evaded or unusual cadences, augmented sixths, chromatic sequences, hypermetric irregularities, and striking changes in register, dynamics, or texture. By the end of the unit students became proficient at discovering and representing the main details of a sonata form. And by the end of the seven-week unit the majority of the class (roughly four of five students) was able successfully to analyze a sonata-form movement from "scratch": with no hints whatsoever.

[23] The study of topics (or *topoi)* has emerged in the past generation as a powerful analytical tool for tonal music. A survey of the field would include: Ratner, *Classic Music*, 1980; Allanbrook, *Rhythmic Gesture in Mozart: Le nozze di Figaro and Don Giovanni*, 1983; Agawu, *Playing with Signs*, 1991; and, more recently, Caplin, "On the Relation of Musical *Topoi* To Formal Function," 2005. Semioticians have picked up this thread, too; see Hatten, *Musical Meaning in Beethoven,* 1994; Grabócz, "A. J. Greimas's Narrative Grammar and the Analysis of Sonata Form," 1998; Monell, *The Sense of Music*, 2000; and Klein, "Chopin's Fourth Ballade as Musical Narrative," 2004.

Final thoughts

I set out to teach a seven-week unit on analyzing sonata form without score. I began by teaching the principles of sonata form by analyzing several works with score. I then created a set of graduated assignments that steadily removed hints and landmarks. Class time was spent listening, doing close analysis, and modeling the act of writing about specific events. By the end of the term, students were able to recognize (in real time) relevant vocabulary elements, mixture, sequences, phrases and cadences, large-scale form, and deviations in hypermetric organization. The majority of students were able to parse development sections and write competently about topics, narrative, and implications for performance. The iPods provided a seemingly endless number of sonata-form movements from the 18th and 19th centuries; students also had the opportunity to hone their listening skills in hundreds of live performances on campus. (They could also transfer their own libraries to the devices.)

Example 11 (see the following page) lists the repertoire I chose for the unit. I realize that we all have our favorite pieces and that there is a multitude of sonata forms—in addition to suitable rondos and concerti. I suggest these pieces because I had success with them and because it is easy to find multiple performances. The works are arranged into categories of easy, medium, and hard, based primarily on length, the degree of formal and harmonic complexity and ambiguity, and the "tallness" of the score. The list allows one to gradually increase the level of difficulty during the unit. It also suggests pieces suitable for final projects.

Overall, I was delighted with the learning that took place in (and out of) the class, especially the final projects, which asked students to analyze a movement without score and write a short (three- to five-page) essay on features of the work they found striking. In my view, students in this class acquired a better understanding of harmonic vocabulary and a firmer grasp of large-scale structure than in previous years. Additionally, they reported in their informal evaluations that they detected benefits in their aural skills classes; that their real-time listening skills improved significantly; and that their listening habits had changed dramatically. (In fact, half of the class purchased their own iPods before they left campus at the end of the semester.) The experience convinced me that it is entirely possible to teach students to "listen up" by using iPods to analyze sonata forms without score.

Easy:	relatively transparent; fairly short; "thin" textures
Mozart	Piano Sonata K. 283, iii, I [Major mode]
Mozart	Piano Sonata K. 309, i, or K. 311, i, or K. 332, i
Mozart	Piano Sonata K. 333, i or iii
Beethoven	Piano Sonata op. 14, no. 1, i
Beethoven	Piano Sonata op. 2, no. 1, [minor mode]
Beethoven	Piano Sonata op. 10, no. 1, i; op. 49, no. 1, i
Mozart	Piano Sonata K. 310, i
Mozart	Violin + Piano Sonatas K. 305, i, or K. 306, i
Mozart	Violin and Piano Sonatas K. 377, i, or 378, i
Mozart	Clarinet Quintet, K. 581, i
Mozart	Symphony in A major, K. 201, i

Medium:	longer; more mixture; more formal ambiguity
Beethoven	Sonata op. 13, i ("Pathetique"); op. 53, i ("Waldstein"); op. 55, i ("Appassionata")
Beethoven	Sonata for Cello and Piano, op. 69, i
Beethoven	Symphony No. 1, 6: i
Haydn	Piano Sonata Hob. XVI: 50, I
Mozart	Sonata for Violin and Piano, K. 304, i
Mozart	Quartet (three strings and oboe), K. 370, i
Mozart	String Quartet, K. 464, i
Mozart	String Quintet, K. 516, i
Mozart	Symphony 36 ("Linz"), ii; Symphonies 39, 40, 41, i
Schubert	String Quartet in a, D. 804
Schubert	Piano Sonata in A, D. 664, i

Hard:	increased length, mixture, formal ambiguity
Brahms	Cello Sonata in e minor, op. 38, i
Brahms	Sextet, op. 18, i
Schubert	Symphonies 5 and 9, i
Schubert	Piano Sonatas in A and Bb, D. 959, i and D. 960, i
Schubert	*Quartettsatz* (difficult)

Extensions include concertos, rondos, and later 19th-century works.

Example 11. Suggested repertoire of sonata forms.

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Review

Engaging Music: Essays in Music Analysis, **ed. Deborah Stein.**

New York and Oxford: Oxford University Press, 2005.

Reviewed by Gordon Sly

Writing in 1971 about articulations of the musical surface that can inform analytical interpretation, John Rothgeb expressed surprise "that there have been so few attempts to specify procedures for the derivation of musical analyses."[1] He qualifies this remark in a footnote: "This is not to deny the existence of pedagogically valuable descriptions of musical structure, but only to observe that such descriptions almost never concern themselves with procedures by which an analysis can be derived or critically evaluated."[2] Were he writing today, that surprise would surely have grown to full-blown astonishment—perhaps colored by a little dismay—as he described a landscape that appears pretty much unchanged.

Rothgeb's remarks bring into focus what I would argue is the central issue in evaluating the usefulness to students of analysis papers purported to be exemplars for their work. Simply put, while any written analysis may have some qualities that can instruct students, what is most important is that its processes be transparent and intelligible rather than obscure and unfathomable. How was its analytical point of view developed? What informed analytical decisions? Which possibilities were rejected and which embraced, and why? What implications flow from those decisions? These are the things that students need to have illuminated.

This transparency of process can be achieved explicitly, of course, or more indirectly. However accomplished, analytical writings meant to serve as guides for students must begin with the premise that they need to know how and why decisions are made. By this measure, *Engaging Music* earns a modest grade. Some of its papers are successful; most are not.

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[1] John Rothgeb, "Design as a Key to Structure in Tonal Music," *Journal of Music Theory* 15 (1971); repr., *Readings in Schenker Analysis and Other Approaches*, ed. Maury Yeston (New Haven: Yale University Press, 1977): 73.

[2] Ibid. p. 73, n. 1.

In the preface, the editor, Deborah Stein, promises "a book of essays *about* analysis by music theorists" (emphasis is mine). A moment later we learn that "topics range from introductions to specific analytical approaches to a wide variety of essays that *model* different analytical techniques (emphasis, once again, is mine). On this latter score, I think the book succeeds: the essays model analytical techniques, and many do so wonderfully well. But "essays *about* analysis" pledges something more, and here the book falls short. As Rothgeb suggests, a basic distinction exists between writing up a completed analysis, even one that progresses step by step, and presenting a methodology, a strategy of approach, a process that students who work through the article will then be able to apply to other musical works. For the most part, *Engaging Music* presents analytical models, but not necessarily methodological or pedagogical models.

That said, there is much of value here. Several of the essays, though they may lack explicit procedural direction, are sufficiently deliberate that a methodology may be able to be extrapolated, either by a student alone or perhaps with a little guidance from a teacher. As well, a number of the articles are marvelously written, and students need all the models of good writing that we can possibly make available to them.

In the pages that follow I provide an overview of the volume and an assessment of its design and editorial organization. After that, I discuss a number of the volume's contributions, focusing particularly on papers that I believe have much to offer students as they work to develop their analytical and writing skills. Finally, I offer a suggestion for using this volume in analysis courses.

Overview

Let me begin by acknowledging that a collection of writings whose goals are to provide for "upper-level music students" (undergraduates and graduate non-specialists alike, we may assume) "models" of analytical writing about music that are tailored to their level of training and experience is most welcome. Professor Stein has managed to bring together twenty-one pieces for the volume. Five are reprints of work published previously, and a sixth is a condensed version of an already published paper, but still, the whole represents a substantial logistical undertaking that addresses a pressing need and deserves our gratitude.

The collection is organized into three broad sections: the first, dubbed an introduction, is devoted to analytical topics and techniques; the remaining two to model essays, first on text-music relations, then on instrumental music. The framing sections—each of which contains eight essays, compared to the middle part on text and music, which has five—are sub-divided by subject; these subjects differ between sections, though "pitch" and "form" appear in both.

The variety that the volume achieves in several dimensions is admirable: vastly contrasted analytical approaches are presented; composers represented range over four centuries; 20th-century music has a prominent place; studies of popular music are included; women composers are represented; and, having authored five of the twenty-one essays, women contribute significantly to the collection. At the same time, the division into introductory studies and model essays seems arbitrary; no significant difference exists between the papers that comprise the opening section and those that make up the following two. Far more importantly, the sub-category entitled "Form" in Part I is represented by Ramon Satyendra's study of Chick Corea's "Starlight," and John Covach's primer on form in rock music. Quite apart from the merits of these papers, when one considers the ascendant position occupied by form in students' analytical work, as well as the dearth of popular music study relative to that of 18th- and 19th-century European music that characterizes the overwhelming majority of music schools in the country, this is a bewildering editorial decision.

The whole is prefaced by William Marvin's three-page "Introduction to Writing Analytical Essays," which, given the central aim of the volume, may well be its most valuable contribution. It is well organized and cogently written. I particularly like the ongoing parallels that Marvin draws between the processes of presenting in writing one's ideas on a piece of music, on the one hand, and practicing one's instrument or preparing a piece for performance, on the other. If the goal of the volume is to hit students where they live, well, this is where they live. They understand that mastering an instrument takes many years of diligent study, and that the journey will involve both hills and valleys. They understand that preparing a performance takes hours of practice, day after day, week after week. Yet many seem to feel that, if they can't get that five-page paper on the Chopin Prelude written in an evening, something is wrong somewhere—with Chopin, with the assignment, with them. Marvin's frequent reference to these more familiar processes both

informs them, and repeatedly reminds them, of what analytical writing really involves.

The main difficulty with which all involved with this project have had to contend involves the limitations—in technical language, in treatment of ideas or constructs—imposed to accommodate the level of experience of the intended audience. The papers generally handle this challenge well, though some of the discipline's subjects cooperate with such cautions more easily than do others (more on this below). From an editorial perspective, this difficulty has given rise to some awkwardness. At the bottom of the opening page of each paper are found "some reminders" that let readers know that bolded words are defined in the glossary, that complete citations can be found in the bibliography, and that certain notational conventions may vary from paper to paper. This same message, then, is delivered twenty-one times. The editor's thinking, of course, is that a book like this is more likely to be read in bits and pieces than it is from beginning to end, so information needed for any one paper is needed for all. Still, these repetitions become tedious and underscore the fact that this same degree of care has hardly been applied uniformly: scores for works analyzed in eleven of the twenty-one chapters are provided following the last chapter and, beyond the table of contents, we aren't informed of this at all.

More significantly, while technical terminology has been kept to a minimum, it is sometimes unavoidable. To deal with such instances, the editor has developed the aforementioned glossary to define these terms. For entries such as "aggregate" and "inversion" this is a perfectly reasonable solution. But for others, a dictionary definition is futile and may even be counterproductive. Entries for the Schenkerian terms "foreground," "middleground," "background," "prolongation," and "structural levels," for example, all direct the reader to "Schenkerian Analysis." Here we find all of these terms (some in quotation marks, others not, some in bold, others not; but all here), but none is defined in any meaningful way. Certainly a student would know little more than he or she had before about any of them, nor about "Schenkerian Analysis" itself, for that matter, from this entry. It would have been far preferable to have excluded altogether definitions of such terms from a glossary and instead pointed students to those essays that treat these ideas. But this observation points up another problem: none of the essays treats these ideas at a level appropriate for students (more on this below, as well).

Other frustrating aspects of the editorial organization concern the suggestions for further reading and introductory materials, which seem utterly haphazard. Eleven chapters provide lists for "further reading" at their conclusion; ten do not. Part II on text and music is prefaced by an editorial introduction and an extensive "further reading" section; Parts I and III have neither. There should be consistency in both areas. In instances where authors were not forthcoming with suggestions for further reading, the editor should have supplied them. If Part II merits a preface, Parts I and III—certainly Part III, which parallels Part II—should have them as well.

Finally, the topics and techniques introduced in the introductory section, to each of which are devoted two essays, include: rhythm, meter, and phrase; pitch; form; and musical ambiguity. This last topic is an unexpected choice given the direction set by the first three. Musical ambiguity, however, is of particular interest to the editor; indeed, her own contribution to the collection appears here. It is, as well, a central idea in our discipline, and one that is rarely addressed directly. Moreover, it has countless pedagogical applications: from the time we introduce it in the form of the pivot chord in a diatonic modulation, musical ambiguity rarely leaves the stage, becoming increasingly important as harmonic vocabulary becomes more chromatic. While the first three topics may have struck any editor as obvious candidates for an introductory section, I doubt the fourth would have occurred to many beyond Professor Stein, and she ought to be commended for having included it here.

Noteworthy Contributions

Editorial wisdom is also much in evidence in the decision to lead off with the two articles that deal with rhythm, meter, and phrase, and particularly in the choice of Charles Burkhart's study of phrase rhythm in Chopin's A♭-Major Mazurka, op. 59/2, to open the book. Not only does this topic have a relatively broad appeal among music students, but Burkhart has a knack for striking a balance of authority and kindliness that sets a compelling and inviting tone for the volume—of inestimable importance considering the anxiety in students often engendered by our beloved subject.

Burkhart's essay is a wonderful example of what analytical writing for students can be. Every analytical decision is transparent. Alternatives are considered. His appeal is always to students' musical instincts. He involves his reader in the process, and

explicitly ties together analytical and performance issues: "Is this plausible?" he asks. "Audible?" "In any event, this extension (bars 17-20) is surely trying to 'tell a story' of some kind. . . . We can only use words in our attempt to suggest it. What might they be? More important, what strategies might the performer employ to convey this 'story' dramatically?" (p. 8)

At the same time, Burkhart's focus on students' musical intuitions and on performance questions lead him to provide only a cursory definition of "phrase." In one sense, this is probably a wise approach: a thorough discussion at this point of what can be a knotty topic could be tedious, and is unnecessary to Burkhart's argument. Still, upper-class undergraduates are likely to have a relatively weak notion of phrase—perhaps a modest grasp of the subject based on the work of Green or Caplin.[3] For a student who has sought out this essay specifically for a clarification of, say, distinctions among the terms subphrase, phrase, and period, and an explanation of how the smaller combine to form the larger, this language is more likely to confuse than to illuminate, and will have to be qualified by a teacher:

Imagine two phrases in succession. If the first is defined by a weak ending and the second by a strong, the total effect will be something greater than simply two phrases: the second ending, because it is stronger than the first, will create the effect of a *single* large phrase, comprising the two shorter ones. (We will call such short phrases making up one longer one "subphrases.") In other words, phrases not only exist one after the other, but also form a hierarchy in which the shorter ones are subsumed by ever larger ones, with the largest constituting a section of the work's form (p. 4; emphasis Burkhart's).

Burkhart's essay is paired with one by Harald Krebs, which uses the *Lieder* of Josephine Lang to introduce students to hypermeter. Both this music and the idea itself will be new to students, of course, and Krebs takes care to convey his sympathy for Lang's work as he leads his reader through its metric organization. Krebs's experience in the classroom is everywhere in evidence here. Ideas are well-ordered and their presentation well-paced. He frequently precedes

[3] Douglas Green, *Form in Tonal Music* (New York: Holt, Rinehart and Winston, 1979); William Caplin, *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart, and Beethoven* (New York: Oxford University Press, 1998).

his description of a musical event with remarks about what *could* have occurred in this place, what the composer might have done instead, which leads his reader to consider why compositional choices may have been made. Finally, he anticipates a potential point of confusion between a hypermeasure and a phrase, and carefully explains the important differences between the two. While his analytical writing may not bring the reader into the process to the same extent as does Burkhart's, Krebs's closing section, which deals with the expressive qualities of hypermetric irregularity, is compelling, and likely to whet students' appetites for further investigation along similar lines.

To introduce analytical techniques that directly address pitch relations in tonal music, Stein turns to an excerpt from Allen Forte's "Schenker's Conception of Musical Structure," which first appeared in the *Journal of Music Theory* in 1959. Of the thirty pages that comprise Forte's classic article, only seven appear here—those, specifically, that present his commentary on Schenker's reading of Robert Schumann's *Aus meinen Tränen spriessen*, the second song of *Der Dichterliebe*.

I am deeply ambivalent about the inclusion of this excerpt here. Constraints on length doubtless made it impossible to include the complete article. Still, though the section reprinted is relatively independent of what precedes and follows it, it is not entirely so, and the context of the full article would have been helpful. Consider, for example, that in the fourth paragraph Forte promises to explain the criteria by which musical details are "eliminated" in successively deeper levels of the sketch. He never gets the chance: that section of the article is not included in this excerpt.

Forte's article well deserves the status it holds in the field, and I am buoyed by the idea that a new generation of students will be exposed to it. Yet it is clearly not the most effective introduction to Schenker's analytical approach for undergraduates. As elegant as his guide through Schenker's reading of Schumann's song may be, it was intended for a professional readership, and is largely inaccessible to the uninitiated. Read through Forte's explanation of Schenker's interpretation of the C♯ in m. 2 as a consonant passing tone (p. 34).[4] In brief, the A in the bass is there to provide consonant

[4] Forte inadvertently indicates this as m. 3, an error that was reproduced in Yeston, and once again here. A typo in the second full paragraph on p. 32 ("m. 5" should read "m. 15") has had a similar history.

support for the passing tone. The tonic chord that results is not generated harmonically, but contrapuntally; it therefore has no harmonic status. This is a sensitive reading, and an excellent example of one of Schenker's truly remarkable and most fundamental ideas. It is also absolutely impenetrable to an undergraduate, at least the ones that I encounter. The inclusion of this excerpt was certainly well-intentioned, but for those intentions to be realized, students will require the curiosity to seek out the full paper and a competent teacher to help bridge the many gaps between their knowledge and the ideas presented therein.

Three of the most valuable contributions to Parts II and III of the book are William Rothstein's "Playing with Forms: Mozart's Rondo in D Major, K. 485," Janet Schmalfeldt's "In Search of Purcell's Dido," and Joel Lester's "The *Presto* from Bach's G-Minor Sonata for Violin Solo: Style, Rhythm, and Form in a Baroque *Moto Perpetuo*." Individually, they are engaging, wonderfully written, and transparent of process. Collectively, they make a powerful and inescapable argument for the importance of a broad frame of reference.

Rothstein's tone, pacing, and clarity are masterful. He is dealing with Mozart's K. 485, a piece marked *Rondo très facile*—probably by its publisher, who, as Rothstein points out, would likely have increased sales of the music by referring to the work as a "very easy rondo"—that is actually in sonata form. It is a monothematic sonata, one written "*in the style of a rondo*, in that the main theme sounds like a refrain and is treated like a refrain" (pp. 204-5; emphasis is his). Rothstein makes the most of the opportunity furnished by the confusion, leading his reader through the historic development of the rondo as seen through French, Italian, and German eyes of various eras, and detailing precisely what we should expect to find if the piece is to fulfill the requirements of the form as Mozart would have understood them to be. Students come to understand not only what they must expect of a rondo formally, but also what they might look for in terms of its character. Citing Koch, Rothstein points out that because of their frequent repetitions, "rondos are not well suited to the expression of lofty sentiments. Frequent repetition suggests naïveté, so rondos tend to be simple and naïve in style" (p. 204). This quality, very much in evidence in K. 485, provides students with another sense in which the piece is written "in the style of a rondo," and perhaps explains how Mozart's publisher may have seen it as a rondo after an only cursory examination.

Once it has been determined that this little "rondo" is, in fact, in sonata-form, Rothstein keeps the distinction between the two forms alive, pointing out at each formal juncture what a rondo would have required. This is, in and of itself, an invaluable lesson for undergraduates: in the study of form, the distinction between continuous (tonally open) and sectional (tonally closed) structures is a central idea—perhaps *the* central idea—that we must get across to students, since it is this distinction that implicates the two basic architectural strategies that underlie all musical forms, expansion and addition. Finally, in a preamble to his discussion of the development section, Rothstein explains that the central harmonic task of the section is to transform I/V into V/I. This simple step accomplishes two important things: it contextualizes the development by viewing it in terms of its role in the larger tonal drama; and it provides guidance and expectation for a section that is pervasively misunderstood by students.

Janet Schmalfeldt's paper is a condensed version of her excellent Purcell study that appeared in 2001.[5] It is essentially a search through the historical versions of the Dido character, leading to a carefully constructed image of Dido as seen through the eyes of librettist Nahum Tate and composer Henry Purcell. Already plausible, given what Schmalfeldt shows us that Tate and Purcell would have known of the historical character, this image is firmly established by the compelling argument Schmalfeldt sets forth based on the musical setting of the heroine's unforgettable farewell.

As any writer will hasten to point out, the importance of a strong opening paragraph can hardly be overstated. This truth is very much in evidence in student writing, as we all know, and must be confronted directly. Just as it is a useful exercise to have students develop an analytical "point of view" statement,[6] so it is to have them work through successive versions to refine an opening paragraph. It must seize its reader's attention, define its subject, and propose an argument. It must begin to establish a sense of trust in the writer, a sense that the reader is in good hands, that reading on will be well worth the investment. *Engaging Music* provides quite a number of very good opening paragraphs, and a few excellent ones; those by Mead, Schachter, and McCreless particularly stand

[5] "In Search of Dido," *Journal of Musicology* 18, no. 4 (2001): 584-613.

[6] This is described in my article, "Developing the Analytical Point of View: The Musical 'Agent'." *Journal of Music Theory Pedagogy* 19 (2005): 51-63.

out. But Schmalfeldt's is peerless. Powerful, intriguing, concise. She begins by declaring that Purcell's setting of Tate's famous words "Remember me. . ." ensures that we will do just that, and then asks three simple questions: who is it, exactly, that we will remember; how did the composer want us to understand this Dido, and; how can an analysis of the music help us to answer these questions? Every word of the essay that follows explores one of these questions.

Another excellent example for student analysis and writing is Joel Lester's study of the *Presto* from Bach's G-Minor solo violin sonata. Like the movement by Bach itself, Lester introduces a single idea and relentlessly explores its implications. The piece unfolds in a constant sixteenth-note motion, calling to mind the perpetual-motion works of later periods. As Lester argues, however, the organization of that motion differs markedly in a Baroque work, influencing both local gestures and more far-reaching formal structures. The essay presents a close reading of metric ambiguity in the piece, focusing particularly on ideas of immediate and broad metric intensification as an architectural strategy of the music.

Closing sections dealing with questions of form and with implications for performance are especially valuable and can serve as well as springboards for class discussions or assignments as they can as models for analytical writing.

Two papers that I would judge to be of limited value as models for students, but would nonetheless recognize here are Edward Cone's "Attacking a Brahms Puzzle" and Patrick McCreless's "Isolde's Transformation in Words and Music." The former was not aimed at students, of course; it was intended for the urbane readership of *The Musical Times*, from which it was reprinted. It requires a frame of reference beyond the grasp of undergraduates, and it deals with Brahms, which is as difficult as tonal music gets, and more often than not proves overwhelming for students.

McCreless's paper *is* aimed at students, and makes the appropriate concessions in vocabulary and breadth of reference, but again, it's subject is difficult and the music dense. Only a student of exceptional ability and determination would be prepared to do the work necessary to follow the author through this music.

This said, both essays are beautifully written, and represent a musical sensitivity that is the very best the discipline has to offer. It would perhaps be best to work through these papers in class, directing students' attention to specific issues to guide their reading.

An Implementation Strategy

Despite my disappointment in the failure of many of its individual contributions to focus on methodological questions and on analytical decisions and implications, I do believe that the book can be put to good use in an analysis course. This is because one of its real strengths is the breadth of analytical perspective that it offers. The balance of my remarks will pursue this idea.

I have frequently found that the use of contrasting analytical approaches to the same piece can be helpful to students.[7] Simply the existence of an opposing viewpoint engenders a skepticism about any and all assertions made that is very largely absent without it. Contrasted views, as well, seem to free students to express their own ideas. While they would not dare offer an alternative to a single "expert" viewpoint, having two already at odds with one another seems to make a third reasonable.

In an analysis course I taught earlier this year (a graduate class comprised almost entirely of performers and conductors), I modified this basic idea so as to make use of *Engaging Music*. Opposing perspectives on the same piece are not presented, of course, but widely contrasting approaches, as well as a number of interestingly complementary approaches, to similar pieces are available. The first several classes were taken up with my own analytical presentations, which were designed to model what I was after from the students. During this time, they were to select a piece, and begin thinking about an analytical point of view and argument. I then met with students individually and had them go through their chosen pieces and ideas for analysis. Based on this meeting, I assigned each student three articles from *Engaging Music*. They were to read, summarize the essential viewpoints and arguments, and then prepare a proposal for their own analytical work that included an explanation of any influences that had come from their reading.

I was very pleased with the results generally, and the best of the work was quite beyond what I had expected. Below I summarize three examples of work that was especially strong. The pieces

[7] I address this idea directly in "Competing Analyses as Pedagogical Strategy and Hugo Wolf's *Das verlassene Mägdlein*," *Journal of Music Theory Pedagogy* 14 (2000): 31-46.

chosen for analysis, an overview of the students' initial views, the readings that I assigned, and an explanation of what I hoped these essays might contribute to the students' work, are provided.

Piece for Analysis: Debussy, Syrinx

This Master's student in flute performance had an inchoate analytical viewpoint at our initial meeting, but she recognized the work's three-part design, and had identified whole-tone and pentatonic segments within the work's fully chromatic surface. She also sensed that B♭ and D♭ somehow played important roles in the piece. Finally, she emphasized that as a performer she connected to the dramatic nature of the piece, though she was unable to expound on that in any way.

The papers I assigned her to read included Andrew Mead's "Learn to Draw Bob Hope! Mort Drucker, Arnold Schoenberg, and Twelve-Tone Music", Ramon Satyendra's "Analyzing the Unity within Contrast: Chick Corea's 'Starlight'," and Charles J. Smith's "'Rounding Up the Usual Suspects?': The Enigmatic Nature of Chopin's C-sharp Minor Prelude."

The central message I hoped Mead's paper would convey to this student was to allow her ears to be her guide. Though undergraduates and non-specialist graduate students are reluctant to trust them, their ears are generally far more sophisticated, if you will, than are their eyes. Mead's chief appeal to students is that they engage twelve-tone music as music rather than as upside-down and backward puzzles. This essential message, conveyed first by Schoenberg himself and echoed by countless advocates of the music since, is, sadly, more necessary today than ever. Terrible misconceptions about most 20th-century music, not just serial music, remain rampant, and students seem, if anything, more conservative than they were a generation ago, and less inclined to give this music a fair hearing. Mead's strategy, like that of Rahn before him,[8] involves an overt appeal to students' ears. With nary a mention of row-forms or TTOs, he prompts them to *hear* the inversional symmetry in that most-analyzed of twelve-tone pieces, Webern's op. 27/2. This accomplished, he begins a twelve-tone primer, focusing still on aural qualities. He constructs a series of examples that illustrate relationships based on trichordal, tetrachordal, and hexachordal

[8] John Rahn, *Basic Atonal Theory* (New York: Longman, 1982).

invariance—relationships, it turns out, that Schoenberg has realized in the opening measures of his Fourth String Quartet.

Whether Mead's approach will provide the "hook" that will secure students' attention and interest in this music is an open question. Most will stay with him for part of the discussion, but I doubt that many can or will follow him through the combined trichord and tetrachord associations. A number of transforms of his example row-forms ("P" and "Q") that feature trichordal and tetrachordal invariance have been presented by this point, but, not having the space to explain just how these particular transforms were discovered (or whether the invariance is peculiar to just these), their selection remains a mystery.[9]

For my purposes here, the chief strength of Ramon Satyendra's paper is its clarity of process. He takes Hans Keller's view that unity between two contrasting passages derives from the latent presence of the former in the latter as the basis of his approach to Chick Corea's *Starlight*. Satyendra begins by making an argument for his analytical approach. This done, he leads students step by step through the analytical process, explaining his thinking as each decision is made along the way, and using sub-headings to identify and order specific tasks. As a kind of template for approaching a written analysis assignment, this paper is singularly effective within the collection. At the same time, the writing tends toward clumsiness at times, and is generally not to the level of many other of the book's contributions.

Charles Smith uses an extra-musical structure to define his analytical approach, proposing to "interpret the piece as having the narrative trajectory of a thriller—that is, presenting puzzles to be solved, raising our expectations only to thwart them, and then at the end unmasking a hidden central character who has secretly controlled the whole story" (p. 237). He presents the analysis as a string of episodes: features in Chopin's C-sharp minor prelude alternate with their counterpart events in Bryan Singer's film *The Usual Suspect*s. Some parallels are more convincing than others, as

[9] The book is generally quite free of errors, and I have not been concerned here with the minor ones that do occur. A labeling problem regarding example 4.4, though, ought to be noted. Mead's reference in the text uses the label "T11IQ," but this becomes "TeIQ" in the example ("e," of course, denotes "11," but it is unlikely that the connection would be intuitive to a student encountering this nomenclature for the first time).

one would expect, but overall it is a highly successful analysis and a very useful paper for students.

Each of these papers made a clear mark on the student's work. The analysis she presented drew a parallel between the performer working her way through the piece and one working one's way through a maze. To solve the maze of the piece requires connecting B♭ to D♭ in the context of a whole-tone scale. Essentially, phrases depart B♭—describing different trajectories and using different figurations—searching for D♭, but cannot achieve that goal without "jumping across" the closed whole-tone barrier from the even set into the odd set. This perspective was particularly effective in the middle section of the piece, where the source collection can be understood as a conflation of pentatonic sets on G♭ and D♭. These sets share four common elements, so their combination yields a six-pc set that Debussy first presents as an ascending scale G♭-A♭-**B♭ — D♭**-E♭-F. Note the two whole-tone segments, the first from the even set, the second from the odd, deployed symmetrically around the privileged B♭-D♭ dyad. This analysis also ends on a high note, as it were, as the music, having tried and tried in vain, finally admits defeat, climbs over the maze wall from B♭ to B♮, and emphatically descends the whole-tone scale to closure on D♭.

Piece for Analysis: Percy Grainger, "The Lost Lady Found" from Lincolnshire Posy

This student, working on a DMA degree in wind conducting, arrived at our initial meeting with a fully-formed analytical plan. The piece, a movement of a large work for wind ensemble, is based on a well-known folk song—so well known, the student suggested, that Grainger could "tell the story" with his instrumental setting alone, as the audience followed along with the text in their heads. What he had not worked out, beyond a few isolated correspondences between story and setting, was just how a composer could tell a story via an instrumental arrangement.

I asked him to read three papers that deal with music and text, and that address specifically the idea that the setting is an *interpretation* of the text: Carl Schachter's "Motive and Text in Four Schubert Songs," Lori Burns's "Meaning in a Popular Song: The Representation of Masochistic Desire in Sarah McLachlan's 'Ice'," and Janet Schmalfeldt's "In Search of Purcell's Dido."

Schachter's well-known study dealing with the connection between poetic imagery and motivic design is one of the five previously published essays that Stein has included. While the paper makes no attempt to instruct students, of course, I applaud its inclusion here, and think it works well: it is brief; the writing is concise; and it is divided into discreet discussions of four Schubert songs, each of which is closely focused on a single analytical idea. These ideas are generally accessible to an undergraduate. The one likely exception to this, the motivic elaboration shown in the sketch given as example 10.9, is aided by Schachter's explanation of the contrapuntal origin of this unusual passage in the following example and its commentary. Finally, it is Schachter: the subtlety of the relationships he illuminates and his unparalleled insights into their meaning are not otherwise available, and students ought to know about this work.

Lori Burns introduces students to the world of female sexual power and identity, masochistic desire, and sexual exploitation in her study of Sara McLachlan's song "Ice." Much of the discussion is devoted to Burns's reading of the text, which concludes that by depicting a specific sadomasochistic relationship between a man and a woman in which the latter, who is on the receiving end, recognizes the insidious nature of their mutual desire, McLachlan points to the broader societal problem of imbalanced sexual power as a manifestation of patriarchal culture. It is a thoughtful and sensitive reading that deserves praise on at least three counts. First, it deals with difficult issues directly and honestly without sanitizing any. Second, it provides an example of song text interpretation that carries two distinct levels of meaning, something students may have to address when dealing with texted works. And third, it demonstrates that analysis can be a remarkably creative enterprise, one that draws more on the analyst's experience, taste, interests, and creativity than on knowledge of arcane analytical techniques.

Burns's reading of the song as a whole attempts to show how the protagonist's ambivalence about this relationship is drawn by McLachlan's musical setting: essentially, passages of the text that are driven by passion are distinguished from those motivated by reason by means of vocal register and type of harmonic support. Burns supports this argument with a series of "voice-leading graphs."

It is unfortunate that students are provided no guidance regarding how they might go about constructing such voice-leading analyses. In a footnote, Burns explains that rock music shares certain conventions with common-practice tonality, but that its harmonic language "expands" to include modes and modal harmonies and to require certain accommodations in the area of dissonance treatment. If this is so, just what constrains interpretative decisions, and how might such decisions be evaluated?[10]

Schmalfeldt's paper, as noted above, deals with Purcell and Tate's image of the Dido character. My main interest here was the closing section of the paper, where Schmalfeldt explains how Purcell composes the nobility of that character into his musical setting.

The analysis of "The Lost Lady Found" was very successful, and extremely well received by this student's colleagues in the class. It asserted the idea of a collaborative performance between the instrumental ensemble, who played the "accompaniment," and the audience who silently performed the vocal part. His presentation projected the text of the story on a screen, along with a highlighted score and an analytical characterization of the music in "bullet points." Several of the parallels he drew between a given event or development in the story and its corresponding depiction in the music were remarkably convincing, and left little doubt that Grainger was also thinking along these lines.

Each of the papers had a clear influence on this work: Schachter's close motivic reading, Burns's idea that separate narrative streams can be depicted musically by contrasts in the setting, and Schmalfeldt's attention to details of setting that together capture the emotional tone of the text all found expression in this analysis.

[10] Burns also calls students' attention to "the debate over the use of reductive analytical techniques to popular music" (note 17, p. 141-2). This is an issue that reaches far beyond this paper, of course, and one that I believe ought to be treated with great care. It is difficult enough to teach students about Schenker's work in the best of circumstances. With ideas of expanded tonal language and relaxed dissonance treatment floating about, and uncertainty about whether this or that voice-leading graph is "real Schenker" or just "sort-of Schenker," students are utterly adrift. Whatever one's views of this issue, we should recognize that the use of Schenkerian notation or verbiage flatters those who use it in a subtle but potentially corrosive way. Its use pre-empts a level of respect or heightened consequence—and those who use it know this very well. Particularly when writing for students, we must be very careful about implied analytical claims.

Piece for Analysis: Lars-Erik Larsson, Concertino for Trombone and String Orchestra, op. 45, no. 7, 1st Mvt., "Preludium"

This music seems to derive from the manipulation of basic melodic cells, which are defined both by interval and by rhythm. This Master's student in instrumental music education, and trombone player, was interested in pursuing a motivic analysis, which he said he felt intuitively, having played the piece many times over several years. I required him to read the following: Joseph N. Straus's "Two Post-tonal Analyses, Webern, 'Wie bin ich froh!,' from *Three Songs* op. 25; Schoenberg, 'Nacht,' from *Pierrot Lunaire*, op. 21," Richard Cohn's "'This music crept by me upon the waters': Introverted Motives in Beethoven's 'Tempest' Sonata," and Roger Graybill's "Formal and Expressive Intensification in Shostakovich's String Quartet No. 8, Second Movement."

The combination of the Straus and Cohn studies I thought would help him both define "motive" for his purposes, and develop a strategy for parsing this non-tonal surface and relating melodic cells to one another. Straus deals with Webern's very angular surfaces, where the idea of interval class becomes central to identifying intervallic similarity. In his analysis of Schoenberg's "Nacht," melodic cells based on interval content are shown to shape the music over different spans or levels, thus assuming motivic significance, a technique that appears to be used by Larsson, as well. Cohn's study of the Beethoven sonata movement focuses on motivic organization at the musical surface. It also possesses a pedagogical strength in that it directly addresses how one might go about a motivic analysis. Graybill touches on formal, motivic, and extra-musical issues, but it was his wrestling with the difficult formal design of the Shostakovich movement that I hoped would be helpful to this student.

The analysis focused on motivic organization, but also presented a convincing account of the movement's form that tied in to the motivic design. Essentially, he saw the movement as being organized as a series of motions that issue from the main thematic idea, and, focusing first on one motive, exhaust its implications before returning to the opening theme and repeating this process with a new motive. The final idea so treated was presented as a kind of "Ur-motive," which carried the movement to closure in a poetic way.

Engaging Music, used *in toto*, and with some imagination, can be a valuable resource for teaching student analysis and writing. Its collective strength is in its breadth of approach, making it useful for undergraduate and graduate non-specialist analysis courses, as well as for graduate student performers needing to write analytical documents for degree requirements, or to prepare lecture-recitals for job interviews. It is the first of its kind; one hopes that it begins a trend.

Reply to Ryan McClelland's article

"Teaching Phrase Rhythm through Minuets from Haydn's String Quartets," vol. 20, 2006

Miguel A. Roig-Francolí

In his article "Teaching Phrase Rhythm through Minuets from Haydn's String Quartets," Ryan McClelland includes an extensive reference to my presentation on hypermeter in chapter 11 of my textbook, *Harmony in Context* (New York: McGraw-Hill, 2003). I appreciate Prof. McClelland's attention to my work, as well as his own presentation on the pedagogy of phrase rhythm. I would like to provide commentaries to some particular points in his discussion of my chapter 11.

First, a clarification: My use of the accent and unaccent symbols differs substantially from Cooper and Meyer's use of the same symbols. Cooper and Meyer assign accents or unaccents to groups (that is, to time spans), from the lowest to the highest hierarchical levels. At higher levels, patterns of accents and unaccents are assigned to phrases, periods, sections, or complete pieces. I assign accents or unaccents, on the other hand, to time points, not time spans. Notice that my accents or unaccents always correspond with beats (at the metric or hypermetric levels), not with groups or time spans. I chose to use accent and unaccent symbols, as opposed to more neutral points (as Lerdahl and Jackendoff do) or lines (as Kramer does), because my discussion hinges on the difference and independence between metric accents (shown by these symbols), tonal accents, and structural accents. In this context, I find it useful, as I communicate these concepts to students, to be able to characterize metric accents as strong and weak. I certainly had no hidden agenda to use these symbols, as McClelland seems to suggest when he states that "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" (p. 10). I appreciate McClelland's attempt at reading my mind to find my "real motivation," but we call this type of thing intentional fallacy. As much as McClelland chooses to focus on the Beethoven example because he disagrees with my hypermetric interpretation, that is only one of many examples (nine, to be exact)

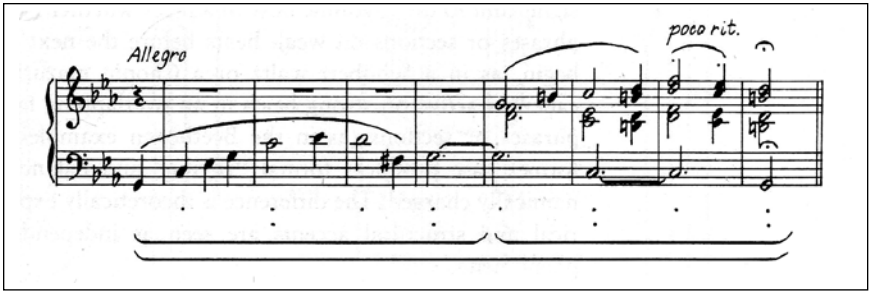
where I use the metric symbols in that chapter, and I fail to see how anyone could interpret that example–to which I devote only eight lines of text–as proof of my "real motivation" to use the symbols.

Second, a correction: My analysis of the opening eight measures of Beethoven's Symphony no. 5, III, is not actually mine, but Lerdahl and Jackendoff's. The issue here is one of the most controversial and discussed matters in the literature on hypermeter, and one that has generated strongly contradictory interpretations among leading rhythm and meter scholars: What is the accentual pattern of a four-measure phrase? Because there are extensive discussions on this matter in several well-known sources, I will not attempt to provide here a summary of the controversy generated by the various answers to this question. I will only say that in a textbook for undergraduates I decided not to take a dogmatic stand on this issue, and, although I stated that "[the strong-weak-strong-weak] pattern is indeed the most standard metric design for four-bar (or eight-bar) phrases" (*Harmony in Context*, p. 358), I did not "hold it as axiomatic that a four-measure hypermeasure begins with a strong beat" (as McClelland does, if I understand him correctly), in following with Lerdahl and Jackendoff's interpretation of four-bar hypermeasures. Indeed, in *A Generative Theory of Tonal Music*, these authors identify three possible hypotheses for metric accents in a four-bar phrase. Hypothesis A is the strong-weak-strong-weak pattern. Hypothesis B is the weak-strong-weak-strong pattern, and hypothesis C is the strong-weak-weak-strong pattern. After demonstrating that hypothesis C is untenable, Lerdahl and Jackendoff write:

> This leaves hypotheses A and B. In both, structural accent can be regarded as a force independent of meter, expressing the rhythmic energy of pitch structure across grouping structure. A dogmatic preference for either hypothesis would distort the flexible nature of the situation; one or the other–or perhaps something more complicated–pertains in a given instance (p. 32).

Following this statement, they show the opening of Mozart's Sonata K. 331 (their example 2.21a) as an illustration of hypothesis A, and *the opening of Beethoven's Symphony no. 5, III, (example 2.21b, reproduced on the next page) as an illustration of hypothesis B*. In other words, not only do they not interpret this phrase as beginning on a strong beat (as McClelland states in his footnote 12, citing page 34 of

Lerdahl and Jackendoff instead of p. 33, where the example and their discussion can be found), but they actually show it as an example of a hypermeasure beginning on a weak hyperbeat (just the opposite of what McClelland claims they do).



Example 2.21b from Lerdahl and Jackendoff's
A Creative Theory of Tonal Music

By using this example, as Lerdahl and Jackendoff do for the same purpose, I was not only leaving open the possibility (as unusual as it may be) that a hypermeasure may not always and necessarily begin on a strong beat (thus avoiding one of the dogmatic stances that has led to so much controversy), but I was showing one more example of conflicting and independent metric, tonal, and structural accents. Schenker's interpretation of m. 1 as an upbeat (*Free Composition*, figure 146.5) does not conflict with Lerdahl and Jackendoff's interpretation of m. 1 as a metrically weak measure, followed by the metrically strong measure 2. The only issue here is whether the hypermeasure begins on m. 1 (weak) or m. 2 (strong), but this does not change the interesting relationship between metric, tonal, and structural accents in this phrase, and that is in the end what I tried to convey to the student with this and all other examples in this section of my book (titled "Harmony, Rhythm, and Meter: Tonal and Metric Accents").

To summarize: I take issue with McClelland's statement that Lerdahl and Jackendoff interpret the Beethoven phrase as beginning at m. 2 (a metrically strong measure) on their page 34, and I acknowledge my debt to them (as I do in footnote 3 of chapter 11) as the origin of my example showing the hypermeasure in this phrase as beginning on m. 1 (a metrically weak measure), as shown by their example 2.21b on page 33. In any case, I'm fully aware and respectful of Schenker's reading of m. 1 as an upbeat. Because both interpretations read m. 1 as weak and m. 2 as strong, they

are far less conflicting than McClelland suggests. An interpretation reading m. 1 as strong, on the other hand, would seem to be much more problematic and, I should think, musically untenable. In any case, I prefer not to live in a music-theoretical world ruled by axioms and dogmas, but rather in a post-modern theoretical space in which things are not necessarily only black and white. I don't believe there is a single ("true") interpretation for many of the musical problems we face. Indeed, I can equally understand and respect both interpretations of Beethoven's phrase (Schenker's and Lerdahl and Jackendoff's). Much of the beauty of great music so often lies precisely in its capacity to allow multiple interpretations.

CONTRIBUTORS

Brian Alegant is a professor of music theory at the Oberlin College Conservatory.

Per F. Broman is an assistant professor of music theory at Bowling Green State University and holds degrees from the Royal College of Music, Stockholm, McGill University, and Gothenburg University. He is the author of *"Back to the Future": Towards an Aesthetic Theory of Bengt Hambræus* and has contributed articles to *Perspectives of New Music, Journal of Popular Music Studies, College Music Symposium* and *Woody Allen and Philosophy.*

Nora Engebretsen is an assistant professor of music theory at Bowling Green State University. She earned her Ph.D. at the University at Buffalo (SUNY). Her work has appeared in *Music Theory Spectrum* and *Theoria*, and she has essays forthcoming in collections to be published by Oxford, the University of Rochester Press, and Stockholm University.

Michael R. Rogers is the Kenneth and Bernadine Russell Endowed Professor (emeritus) of Music Theory at the University of Oklahoma. He currently lives in Eugene, Oregon and continues to pursue research on the relationship of musical analysis to performance (both the values and limitations) and is particularly interested in the often-overlooked role of intuition.

Miguel A. Roig-Francolí is a professor of music theory at the College-Conservatory of Music of the University of Cincinnati, where he was recently honored with the A .B. "Dolly" Cohen Award for Excellence in Teaching. His articles and reviews have appeared in numerous journals internationally, and his textbooks, *Harmony in Context* (2003) and *Understanding Post-Tonal Music*, are published by McGraw-Hill.

Elizabeth West Marvin is a professor of music theory at the Eastman School of Music of the University of Rochester, where she also holds a secondary appointment in the Brain and Cognitive Sciences Department. She is co-author of music theory, aural skills, and fundamentals textbooks in *The Musician's Guide* series published by W. W. Norton.

Keith Salley is an associate professor of music theory at the Shenandoah Conservatory in Winchester, Virginia. He has taught jazz guitar at the University of Memphis and Tulane University.

Stephen Slottow is an assistant professor of music at the University of North Texas. He received his Ph.D. from the Graduate Center, The City University of New York, and has published in such journals as *Theory and Practice*, *Intégral*, *Journal of Music Theory Pedagogy*, and the *Journal of Schenkerian Studies*. He is writing a book on Carl Ruggles's music that will be published by Pendragon Press.

Gordon Sly is an associate professor and chair of music theory at Michigan State University. He teaches in the undergraduate sequence as well as graduate courses in counterpoint and analysis.

GUIDELINES FOR CONTRIBUTORS

1. Articles on any aspect of teaching or learning music theory will be welcome. Contribution will be judged on originality, relevance, interest to a diverse audience, and clarity of writing.

2. Manuscripts should be typed double-spaced (including footnotes, references, and quotations) on 8-1/2″ x 11″ paper with at least one-inch margins. Please submit five clear copies. All footnotes, tables, figures, musical examples, and other material should be placed at the end on separate sheets with an indication of where they fit in the text. Long musical examples and complex diagrams or charts should be avoided when possible. Please also avoid musical symbols (i.e. notation) within the running text.

3. The author of an accepted manuscript will be asked to revise the article (if necessary) to fit the style guidelines of the journal. Authors will be sent guidelines for style and guidelines for electronic manuscripts. Please do not send disks until requested to do so.

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5. The author is responsible for providing camera-ready copy for all non-text items, and for insuring that all tables, figures, musical examples, and other material are legible when reduced to 4-1/2″ x 7″ dimensions. This material should also be submitted electronically if possible. (PDF format preferred)

6. Manuscripts are accepted on the condition that they are unpublished and are not presently being submitted for publication elsewhere. Since all submissions are reviewed anonymously, please include the author's name and address only in the cover letter and eliminate identifying references (such as names of schools) from the article.

7. Please address all correspondence to:

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