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From the Editor

Welcome to Volume 29 of the *Journal of Music Theory Pedagogy*. This is the inaugural open access volume of the journal, available on the newest incarnation of the web site Music Theory Pedagogy Online at https://music.appstate.edu/about/jmtp, supported by the Gail Boyd de Stwolinski Center for Music Theory Pedagogy at the University of Oklahoma in collaboration with the Hayes School of Music at Appalachian State University. In addition to past and current volumes of the *Journal of Music Theory Pedagogy*, this open access web site hosts the *Music Theory Pedagogy E-Journal* articles, peer-reviewed pedagogical resources for instructors, and peer tutoring opportunities for theory students. The web site aims to provide clear, easy-to-implement music theory materials designed for a range of instructors, from those who teach in high schools to those in universities and conservatories. I encourage you to take some time to explore the web site, share it with your colleagues and students, and submit your own materials to this growing resource.

The current volume of the journal contains an intriguing variety of articles on a broad array of topics that will resonate with all of our readers. The authors ask us to rethink some fundamental questions: Why do we teach what we teach? Which traditions have we inherited, and how do these frame our understanding and teaching of music theory? How might we approach these issues differently by adopting a different perspective, whether of historical precedent, teaching approach, or modes of presentation?

Richard Cohn offers a bold reimagining of the striking asymmetry between the time we devote to tonality versus meter in our typical music theory curricula in "Why We Don't Teach Meter, and Why We Should." Using a familiar and deceptively simple piece—Beethoven's "Für Elise"—Cohn explores how a technically easy passage can set a metric trap even for seasoned performers (audio examples of these performance errors are available on the JMTP web site at http://music.appstate. edu/about/jmtp/articles).

In "The Archaeologist's Paradise: Digging Through Solo-Polyphonic Ambiguity in the Counterpoint Classroom," **Michael Callahan** provides a roadmap for helping students untangle the

contrapuntal weave of solo polyphonic music, imaginary voices and all. Callahan embraces the ambiguity inherent in these works, and provides sample classroom materials that help students explore the implications of ambiguity in this context as composers, performers, analysts, and listeners.

While many discussions of the flipped classroom focus on large, introductory courses, **Brenda Ravenscroft** and **Victoria Chen** explore the effect of using a flipped model, team-based learning, and technology in an upper-level post-tonal course in "Enhancing Learning in an Advanced Analysis Course: the Flipped Model, Peer Learning, and the Mode Effect." A variety of methods are used to assess the effect of the pedagogical model. In addition to contributing to the pedagogy of music theory, this article is a contribution from the field to music theory to the larger dialogue across the country about pedagogical innovation and active learning classrooms.

Michael Masci engages the challenging task of helping students understand chromatic harmony in "Three *Leçons* in Harmony: A View from the Nineteenth-Century Paris Conservatory." Rather than extending approaches grounded in current common practice pedagogy, Masci draws from the Paris Conservatory tradition, especially the work of Émile Durand. His pedagogical approach aims both to make chromatic harmony more accessible, and to help students become fluent with chromatic harmony through composition, especially in contexts that do not rely on common practice syntax.

In "Profiles, Perceptions, and Practices Related to Customizable and Computer-Aided Instruction among Postsecondary Aural Training Instructors," **Sheila Clagg Cathey** and **Jay Dorfman** explore the characteristics and perceptions of instructors who use computer-aided instruction (CAI). Through a survey of postsecondary instructors, Cathey and Dorfman identify the most salient influences on instructional uses of CAI, including years of experience teaching aural skills and using CAI, gender, and the highest degree obtained. Conclusions from the study highlight the importance of the instructor's role in thoughtfully integrating CAI into the curriculum in order to have the most beneficial effect on student learning.

Nicole E. DiPaolo reviews R. Ryan Endris's *Music Theory for Beginners*. Despite its title, this is not a traditional undergraduate theory fundamentals textbook, but a graphic novel-like text aimed at the lay reader. DiPaolo evaluates the style, design, and broad range of content included in the text, as well as its effort to reach out and engage with a more diverse audience than most traditional music scholarship.

Finally, I want to draw your attention to the exciting news that the first Music Theory Pedagogy Conference, *Pedagogy into Practice: Teaching Music Theory in the Twenty-First Century*, will be held June 1–4, 2017 at Lee University (Cleveland, TN). The Gail Boyd de Stwolinski Center for Music Theory Pedagogy, in partnership with the editorial boards of the *Journal of Music Theory Pedagogy* and *Music Theory Pedagogy Online*, welcomes proposals for research papers, posters, panels, demonstrations, and workshops that relate to any aspect of music theory pedagogy, with a proposal deadline of January 15, 2017. The best student paper/presentation will be awarded an honorarium and publication in the *Journal of Music Theory Pedagogy*. More information is available at the conference web site at https://music.appstate.edu/about/music-theory-pedagogy-online/conference. We welcome participation from a broad range of theory instructors, including high school AP teachers, college faculty whose primary specialty lies outside theory (e.g., performance, musicology), and professional theorists.

Why We Don't Teach Meter, and Why We Should

By Richard Cohn

An interplanetary visitor asks: "What is music?" The question requires a complicated response, but you want to be concise, so you might say, "Music is patterns of sound, in patterns of time." You might add that it is an activity by and for humans, who use it in every known culture to fulfill a range of functions, and ascribe to it a range of significatory powers.

If the visitor now asks, "What is music theory?" you might answer something like: "It aims to understand patterns of sound in patterns of time, and how humans process, interpret, and assign meaning to those patterns."

The visitor, who is a very quick study, might then say, "Since there are two types of patterns, I would imagine then that music theory is organized into two major branches." This is another tough one, but you again want to avoid a tedious answer. So you say, "Right! Our encounters with music involve mentally filtering sound through two regulative systems. TONALITY studies how we process, interpret, and ascribe meaning to pitched sounds. METER studies how we do the same for sounds in time." You might then hasten to add that even though those two systems are in principle independent of one another, they are richly interactive.

Examining now some textbooks on music theory, our visitor is puzzled. "I now understand a lot about tonality, how the mind makes sense of patterns of sound. But I understand very little about meter, how the mind makes sense of patterns of time. Each table of contents has between twenty and thirty chapters on tonality, but only one or two chapters on meter. Evidently the authors of these textbooks believe that students should study only one of these two branches of musical patterning, even though you implied that they are equally central to the experience of music."

Looking now at some educational curricula, the visitor finds the same imbalance. "I see that human music students, in their late adolescence, dedicate perhaps two years of part-time study to learning music theory. From what you told me, I would have expected one year on tonality, and one year on meter. But I find no institution that teaches these two topics with anything close to parity. Why is there a mismatch between what you say that music theory is, and what everyone learns about music theory?"

I can't begin to predict how you might answer this question, because I can't come up with a sensible answer myself. I will, however, present some preliminary speculations later in this paper.

Music theory has perpetuated the tonality/meter asymmetry through many generations, as if it were a natural state of affairs and the only option available. The encounter with the interplanetary visitor suggests a perspective from which to view this asymmetry as peculiar, and ripe for examination.

I

At least since ancient Greece, thinkers about music have intuited a deep analogy between pitch and time. The analogy has at least eight facets: (1) Both are strictly ordered on a continuous spectrum; (2) the mind organizes both continuous spectra into sets of points; (3) those points are understood to be equally spaced, even though they are not exactly so when physically measured; (4) those punctuated lines are wrapped into cycles; (5) one of the cyclic positions has an orienting function (tonic, downbeat);[1] (6) from the remaining points, a maximally even selection is made;[2] (7) the maximally even selection iterates through one or more subsequent levels; and (8) the relationship between elements that are adjacent at some level is mapped onto the biological and physical world through a cluster of metaphors such as stability, magnetism, attraction, and energy.[3] Thus meter and tonality regulate their domains in parallel, in terms of both syntax and semantics, and structure and experience.

These affinities are inherited by the institutions through which music has been disseminated and perpetuated in the European notated tradition. One such institution is the notation itself, which represents music as a stylized Cartesian grid, with one axis for pitch

[1] Jay Rahn, *A Theory For All Music: Problems and Solutions in the Analysis of Non-Western Forms* (University of Toronto Press, 1983).

[2] John Clough and Jack Douthett, "Maximally Even Sets," *Journal of Music Theory* 35 (1991): 93–173.

[3] Concerning the history of these ideas, see Lee Rothfarb, "Energetics," in *The Cambridge History of Western Music Theory*, ed. Thomas Christensen (Cambridge University Press, 2002), 927-55. For a recent application see Steve Larson, *Musical Forces: Motion, Metaphor, and Meaning in Music* (Indiana University Press, 2012).

and one for time, both punctuated if not quite uniformly spaced.[4] Both domains are regulated by *signatures*, dually mounted at the head of a score. In our musical culture, signatures are conveyors of quantitative information: which tones are in the scale, and how many beats of what duration occur in each measure. Until around 1800, though, signatures regulated a good deal more. Under tuning systems that preceded equal temperament, key signatures reflected a difference in micro-tuning.[5] Similarly, in part due to their association with social dance, each meter signature communicated a difference in micro-timing, as well as characteristic tempi (*tempo giusto*) and accentuation patterns.[6] In both domains, that surplus was associated with semantic qualities: moods, affects, and contexts. Like Renaissance modes and South Asian ragas, signatures referenced emergent phenomena that bundled a set of disparate properties, both quantitative and qualitative.

Both systems of associated moods and contexts decayed around the turn of the 19th century.[7] Without their surplus, the signatures converted to conveyors of quantitative information and lost their audible distinctiveness. In the domain of pitch, one key signature sounds like another, except for that minority of listeners with absolute pitch. Entire pieces can transpose without change of structure, experience, or identity. It is no coincidence that, at this rough historical moment, scale degrees emerge as default classifications for tonal events.

Similarly, in the domain of meter, many metric notations lost their distinctiveness. Consider the three notations in Figure 1. Once they become dissociated from their tempo giusto qualities, it becomes difficult to assert an audible distinction between them.

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[4] For representations of music that more closely approximate a Cartesian grid than does standard notation, see the web site of Stephen Malinowski, http://www.musanim.com.

[5] Rita Steblin, *A History of Key Characteristics in the Eighteenth and Early Nineteenth Centuries* (University of Rochester Press, 2002).

[6] George Houle, *Meter in Music, 1600–1800: Performance, Perception, and Notation* (Indiana University Press, 1987).

[7] See Steblin, *A History of Key Characteristics*; Danuta Mirka, *Metric Manipulations in Haydn and Mozart: Chamber Music for Strings, 1787–1791* (Oxford University Press, 2009); and Roger Matthew Grant, *Beating Time and Measuring Music in the Early Modern Era* (Oxford University Press, 2014).

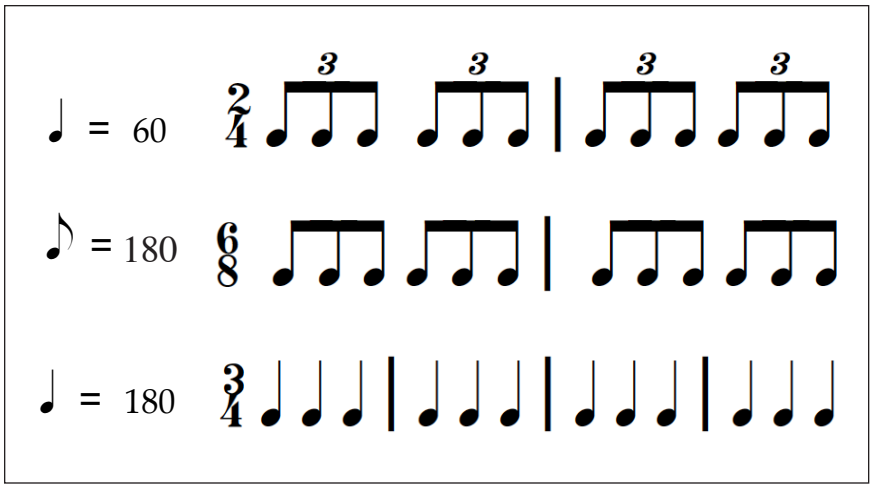


Figure 1. Three notations of a single heard meter

Yet here we arrive at the first way that tonality and meter are differently treated. In the domain of tonality, this loss of distinctiveness is universally accepted. But not so in the domain of meter: many musicians will attest that, even stripped of their tempo giusto historical context, there are nonetheless significant qualitative distinctions between these three notations, to a degree that is often said to affect the identity of the artwork. Although no educational institution would ask students to identify a key signature (i.e., an absolute transposition) on the basis of uncontextualized auditory input alone, students are commonly asked to distinguish by ear between the three notations in Figure 1.

These asymmetries are related to ones in our systems of musical education, earlier observed by our inter-planetary friend. Characteristically, a music theory textbook contains a single chapter on meter, positioned early in the book, among a small cluster of chapters on rudiments. The chapter begins with a catalogue of durational symbols, proceeds to a definition of meter, reviews the standard six-fold classification of meters, and establishes the relationship between these classes and the notational conventions of meter signature and bar line. Although this chapter is remedial, it makes a significant contribution to the primary business of the book, as it prepares the lesson in appropriate positioning of dissonances and harmonic changes, which are central aspects of European tonal practice. Accordingly, the more sophisticated textbooks indicate that the strong/weak distinction, which guides

these aspects, is present at several distinct levels of the metric hierarchy: on- and off-beats, strong and weak beats, first and third beats, and even between successive downbeats of a hypermeasure. Beyond this, a textbook might devote a paragraph or two to several additional metric topics, such as hemiola, syncopation, and types of accentuation, either to fill out this early-chapter introduction, or as a stand-alone chapter that appears later on. Otherwise, it's all tonality all the time.

Turning now to the substance of these chapters, here are four definitions of meter from the early chapters of recent American harmony textbooks, authored by four former presidents of the Society for Music Theory and one former editor of this journal.

- "Beats are . . . grouped into a regular repeating pattern of strong and weak. This is the *meter*."
- "This pattern of stressed and unstressed beats results in a sense of metrical grouping or meter."
- "Meter provides the framework that organizes groups of beats and rhythms into larger patterns of accented and unaccented beats."
- "**Meter** is the arrangement of rhythm into a pattern of strong and weak beats."[8]

Four elements recur in these definitions: beats; patterns; grouping (arrangement, combination); and strong/weak (accented/unaccented, stressed/unstressed). The same four elements appear in Johann Phillip Kirnberger's definition of meter from 1776, but substituting "regularity" for pattern and "segment" for group:

> When we hear a series of beats (*Schlage*), we divide them metrically (*taktmässige*), and arrange those regular divisions into segments (*in Glieder ordnen*)….We place an accent on the first beat of each segment (*den ersten Schlage eines jeden Gliedes einen Accent legen*).[9]

[8] In order, the quoted passages are from Joel Lester, *Harmony in Tonal Music*, Vol. 1 (New York: Alfred A. Knopf, 1982), 82 ; Robert Gauldin, *Harmonic Practice in Tonal Music* (New York: W.W. Norton, 1997), 18; Steven G. Laitz, *The Complete Musician* (New York: Oxford University Press, 2003), 28–29; and L. Poundie Burstein and Joseph N. Straus, *Concise Introduction to Tonal Harmony* (New York: W. W. Norton, 2016), 10.

[9] Johann Philipp Kirnberger, *Die Kunst des reinen Satzes*, Vol. 2 (Berlin and Königsberg: Decker und Hartung, 1776), 114–115.

Kirnberger's definition was customized for the only musical repertory that he knew, a system of tempo giusto in which it was necessary to pin meter to two pulses in the metric hierarchy via the meter signature, in order to communicate the tempo and mood of the composition. Today's music student exists among a wider variety of musical styles, eras, and cultures, whose metric qualities are not necessarily those of Dittersdorf.

The system by which music theory textbooks classify meter is older yet. Students learn that there are six kinds of meter: duple, triple, and quadruple, each in a simple and compound version. This classification was initially introduced by Étienne Loulié, musical servant of the Duchesse de Guise, in 1696.[10]

What is putatively being classified here is *meter*, a sounding property of a composition or improvisation as organized by the listening mind. But what is actually being classified here is not the set of pulses and pulse relations that the listener is hearing; rather, it is the *meter signature*, representations that the performer is seeing, using the notational conventions that were developed for 18th-century music. Because of the micro-timings, accentuation patterns, and tempi with which meter signatures were associated under the system of tempo giusto, in the 18th century these distinctions in representation, such as those indicated in Figure 1, reflected a distinction in sounding experience, i.e., a distinction with a difference. But this is a difficult position to hold for music already in the early 19th century. As I have already illustrated in my discussion of Figure 1, the mapping of meter signatures onto metric experience is far from one-to-one.

To summarize: we teach almost nothing about meter. What little we do teach is customized to the compositional practices of 250 years ago, in a pre-hypermetric era of tempo giusto, when it could be reasonably said that "the meter" of a composition was co-extensive with its meter signature. More than two centuries of changes in musical style and compositional technique, a sustained encounter with musics of the Eastern and Southern hemispheres, and forty years of intensive research in the field of musical meter by music theorists and music psychologists have made little impact on the way that musical meter is taught in institutions of higher education, to the extent that it is taught at all.

[10] Houle, *Meter in Music*, 36.

II

In order to highlight the peculiar nature of this situation, I want to propose a pseudo-curriculum where the relative percentage of attention to meter vis-à-vis tonality is inverted. I call it a pseudo-curriculum because I am not advocating that it be used as a guide to teaching students. Some historical context will help readers understand why this caveat is necessary. I once proposed another pseudo-curriculum, in order to reflect on some aspects of the then-current state of music theory.[11] After an oral presentation of that paper at an SMT plenary session, one member of the audience, misunderstanding my intention, rebuked me for telling colleagues how and what to teach, and with such a wrong-headed set of ideas at that. So I am eager to forestall any such misinterpretations.

With that caveat in place, ladies and gentleman, let me welcome you to Music Theory 101, the first semester of your four-semester sequence.

MUSIC 101. First-Semester Music Theory

Basics of Meter

Week 1.	The Neurobiological Basis of Meter: Entrainment and Projection
Week 2.	Pulse, Tactus, and Subjective Metricization
Week 3.	Two Kinds of Minimal Meter: Duple and Triple
Week 4.	The Metric Hierarchy and Deep Meter
Week 5.	Notational Matters: Durational Symbols, Meter Signatures and Bar Lines
Week 6.	Tactus and the Idea of the Primary Level. Conducting Patterns.
Week 7.	Classifications of Meter
Week 8.	Representing Meter: Dot Notations and Ski-Hill Graphs
Week 9.	*Key Signature, Scale, and Chord. The 13 Kinds of Tonality.*
Week 10.	Kinds of Phenomenal Accent
Week 11.	Metric Induction
Week 12.	*Consonance and Dissonance*
Week 13.	Second Species Counterpoint (Controlling Two Levels of Pulse)
Week 14.	Third Species Counterpoint (Controlling Three Levels of Pulse)
Week 15.	Fourth Species Counterpoint (Pulse Displacement)

[11] Richard Cohn, "Music Theory's New Pedagogability," *Music Theory Online* 4, no. 2 (1998).

Like the standard curriculum now in use, this mirror curriculum focuses on one of the two regulative systems through which listeners process music. There are nonetheless two weeks, italicized in the syllabus, that are set aside to learn the rudiments of the other regulative system. Here are some features of those lessons on tonality.

In Week 9, we define and classify the thirteen kinds of tonality that occur in music. Just as students now learn a notationally based definition of meter, in my proposed curriculum they learn a notationally based definition of tonality, as "the arrangement of musical pitches into scales via key signatures."

Current textbooks assume that, once students can appropriately classify the meter of a composition into one of six categories according to their meter signature, they know enough about meter to go forward with their studies of tonality. This mirror curriculum assumes inversely that, now that students can appropriately classify the tonality of every composition into one of thirteen key signatures, they now know enough about tonality to go forward with their studies of meter.

The first semester culminates in some lessons in species counterpoint, when students learn how to simultaneously control two and then three levels of pulse (second and third species), and to coordinate a single pulse with its displaced image (fourth species), all skills that are fundamental to metric composition in the European style. But to do this correctly requires students to distinguish consonant from dissonant intervals, and so a second unit on tonality is added late in the semester by way of preparation.

If you feel the desire to stamp my pseudo-curriculum PREPOSTEROUS, as I expect you will, then I invite you to reflect on its mirror image, which is something like the actual curriculum that you and I have been teaching for years. Does the mirror reflect the PREPOSTEROUS stamp onto that curriculum as well? If not, why not?

III

What motivates the tonality/meter asymmetry in music theory pedagogy? Any response is undoubtedly complex, weaving together many distinct strands, each of which is complex on its own terms, independent of the others. Here I simply lay out for consideration some strands that occur to me, without making any claims concerning their pertinence or explanatory value.

1) The first component, and the one most inherent to the substance of music, is the complexity of time itself: insubstantial, intangible, unfathomable. Because meter inherits this complexity, it is too difficult to study: either you sense it or you don't.

2) Our musical culture simultaneously harbors a contrary impulse, which is to view meter as too simple to require close examination. On this view, meter is about isochronously cycling small numbers whose content and order are learned in early childhood. What theory worth studying could attach to that? This impulse sits particularly comfortably within the European tradition, which historically has staked its claim to superiority on its sophisticated system of tonality, acceding metric complexity to the civilizations south of the equator.[12]

3) A related ideology associates tonality—and hence a Northern sensibility—with the mind, and the metric complexity of the south with the body.[13] The linkage of meter to the body, most evident through dance, is reinforced by neurobiological findings which show that pulse entrainment is closely bound to motor centers in the brain, centers that are involved with pre-conscious "first thinking" rather than the conscious and calculating "second thinking" that is characteristically the concern of musical studies in the academy.[14] The asymmetric valuing of mind and body is mapped onto the relation between tonality and meter, insuring that the Northern brand of superiority is the superior kind of superiority to possess. Like many ideologies, these ones need not be held consciously or explicitly in the modern academy, much less be endorsed by it, in order to work on contemporary sensibilities via the mechanisms of cultural transmission through historical time.

[12] Kofi Agawu, *Representing African Music: Postcolonial Notes, Queries, Positions* (Routledge, 2003).

[13] Susan McClary and Robert Walser, "Theorizing the Body in African-American Music," *Black Music Research Journal* 14, no. 1 (1994): 75-84.

[14] Aniruddh D. Patel, *Music, Language, and the Brain* (Oxford University Press, 2007).

4) We can also identify some historical circumstances that are specific to the way that music has been institutionalized in the European academy. The harmony/counterpoint/form troika arrived early in the 19th-century conservatory, complete with supporting textbooks and entrenched pedagogies. The conservatory, "conservative" in at least the pre-political sense of the term, has conserved pedagogical practices as well as repertories. And it has done so with such weight that its inertial character has survived the subsequent migration of musical training into the liberal arts college, where pedagogical conservation is characteristically (if sometimes slowly) trumped by new research.

5) In the contemporary conservatory and university, these last concerns merge with more practical forces that nurture pedagogical inertia. These include the following:

- the strict bounding of music theory's share of the curriculum, which insures that music theory pedagogies operate in a zero-sum habitus: any addition of meter entails a painful subtraction of tonality that, in the best cases, involves materials lovingly and creatively cultivated by teachers over a period of years
- expensive mega-textbooks that run students through uniformly structured multi-year curricula dedicated primarily to tonality and quasi-exclusively to pitch structure
- national certifying bodies and, in some countries, testing regimens that reward accession to that uniformly standard curricula, punish violations, and consequently deter curricular innovation
- pressure on post-graduate programs to apprentice future music theory teachers into the standard curriculum, deterring innovation at the level where it would most naturally emerge

Determining which of these strands and sub-strands have explanatory value, and untangling them from each other, would be a complex project that would most benefit from the skills of scholars trained in educational and cultural history.

IV

What would be gained by including meter as a robust partner in a music theory curriculum? I will make the case from two perspectives, one oriented toward the music theory's position in the liberal arts and humanities, and the other toward its function in the conservatory. The first involves ethical and pragmatic issues that have long been part of the quiet dialogues that music theorists have with each other in private, if less so in the public sphere. I have little new to say on these matters; I treat them briefly here simply to remind readers of their relevance to the particular issue I engage in this paper.

The ethical issue pertains to the focus on the classical music of European tonality, particularly as practiced in a roughly two-century span with Beethoven at its chronological fulcrum, and Vienna at its geographical one. Although there are many virtues to this curriculum, particularly if it is informed by historical awareness, it is deeply inconsistent with other strands of academic culture, and with values that many music teachers and scholars bring to other aspects of their lives.

To act on those values is to situate European classical music as a species of a universally human activity of music-making, manifest in many musical materials and syntaxes that invite many kinds of music theory.[15] Most of these musics engage both tonality and meter, whose dual status as regulative systems that transform sound into music is evidently situated in human biology, if also profoundly molded by the particularities of place and time, of culture and history.[16] The principles and protocols of Classical tonality, though, make poor candidates for generalization and adaptation, as they are founded in harmonic and polyphonic practices that are idiosyncratic from the perspective of the musics of the world.

Theory of musical meter suffers few such limitations. A general theory of meter, suitable for analysis of historical European

[15] Two publications intended for the classroom that boldly moved in this direction were Robert Cogan and Pozzi Escot, *Sonic Design: The Nature of Sound and Music* (Prentice Hall, 1976); and David Ward-Steinman and Susan L. Ward-Steinman, *Comparative Anthology of Musical Forms* (Wadsworth Publishing Company, 1976). Both appeared exactly forty years ago, when meter was beginning to come front and center in both music theory and psychology.

[16] Gary Tomlinson, *A Million Years of Music* (MIT Press, 2015).

classical traditions, is adaptable to a number of other metric musics, including jazz, American and global popular repertories, electronic dance music, and musics of Latin America, the Caribbean, Western Africa, Southeastern Europe, India, etc. In each case, metric theory requires customization to the particularities of the music and the musical culture, and also benefits (especially from an ethical standpoint) by interaction with music theory as it has developed within those cultures. But the gap is, in principle, much smaller. Less of the technology developed for European meter needs to be parked on the shelf, in comparison with the case of European tonality. Accordingly, if one wants to teach a theory of European classical music that is generalizable to the musics of the world, there is a strong incentive to teach a theory of meter, and very little incentive to teach the sort of theory of tonality that is represented in our current textbooks and curricula.

The ethical concerns emphasized above overlap with more pragmatic ones. When Anglophone students listen to music, and develop the sort of curiosity about it that can be serviced by a music theory course, what they are listening to is not the music that we teach.

Simply as a matter of pedagogical efficacy, there is benefit to teaching students about music they already know and care about, at the same time that we satisfy our Humboldtian commitments by opening up new musical universes that our students never imagined.

V

The second concern involves considerations particular to the classical music still at the core of conservatory training. What I would ultimately like to argue is that exposure to a theory of meter will encourage classical performers to imagine scores in more flexible and interesting ways, and to develop inner hearings that lead to the kinds of performances that our musical culture tends to value. This is a difficult argument to make on paper, in part because the attributes that make a performance both interesting and appropriate are, by their nature, not subject to consensus. So I will initially adopt a more modest agenda: to suggest that a theory of meter will help musicians to render scores "correctly," i.e., to play the right notes in the right order and at the right time (to within the tolerances of tempo elasticity and expressive variation). There is a

better chance of making a convincing argument here, since fidelity to the score is indisputably a fundamental and shared value within the community of classical music performers and teachers.

To make this case, I introduce Gideon, my former neighbor with whose family I once shared an apartment wall. Gideon was a musical but by no means precocious child. Day after day I heard Gideon playing "Für Elise." Beethoven! I'm certain that his parents were very proud to say that their ten-year old was playing the music of that composer.

But Gideon wasn't quite playing Beethoven. Every time that he reached the dominant prolongation at bar 12, he couldn't determine how many times to alternate D♯ and E before cascading down to the tonic A. He was performing these measures as if there was a fermata over the middle of bar 13 and an indication to slowly trill ad libitum. I had a similar difficulty, as a young pianist, in keeping my place. And I sense, from the smiles and nods that I receive whenever I mention this passage to an audience, that others are familiar with it, too.

The problem is not unique to students and amateurs; it plagues some of our greatest concert artists as well. On his second *volta* through these measures, Artur Schnabel extends by one extra ♪, playing one too many D♯/E alternations.[17] On his first trip through the same music, Alfred Brendel contracts by the same amount, playing one alternation too few.[18] (Both of these passages are available through the JMTP web site at http://music.appstate.edu/about/jmtp/articles.) Schnabel and Brendel have well deserved reputations as among the most scholarly of musicians, for whom textual fidelity is a particularly cherished value. Schnabel edited the Beethoven sonatas, and Brendel wrote an essay titled "The Text and its Guardians."[19] There is no question that these are errors, rather than "textual variants" (as one pianist colleague tried in desperation to argue to me). The miscountings occur only once within their respective performances; every other time that they

[17] Artur Schnabel, *Beethoven Piano Works*, Volume 10, 1937-38, Naxos Historical #8110764. This is distinct from Schnabel's 1932 recording of "Für Elise," which is the one currently posted on YouTube, where Schnabel adopts a slower tempo and plays it to perfection.

[18] Alfred Brendel, *Beethoven Variations and Vignettes*, Volume 3, 1992, Vox. Brendel recorded this piece many times; both of the ones currently posted to YouTube are of different performances.

[19] Alfred Brendel, *Music Sounded Out* (New York: Farrar Strauss, 1990), 54.

reach the dominant prolongation, they reliably measure out the correct number of D♯/E alternations before discharging to the tonic.

Why is this passage hard, even for the finest musicians? Certainly not because of the technical demands of the passage. The left hand is inactive, and the right hand plays two adjacent pitches, one at a time, in a moderate tempo. If the demands are not physical, then they must be cognitive. To get this passage right, these pianists don't need to return to the practice room and work on their scales and arpeggios. They need to sit with the score and think about it, until they form a clear mental image of how to render it as notated. (It was Schnabel who liked to say: "First hear, then play.")[20] And this project will benefit from a systematic framework that will guide their thinking.

What makes musicians lose their bearings is the difficulty of hearing the notated downbeats as downbeats. As shown in Figure 2, the four-bar passage consists of three gestures: a series of upward rising E's in multiple octave, an alternation of neighboring pitches, D♯5/E5, and a cascading descent to A. Only the first of these gestures initiates on a notated downbeat. Moreover, the gestures that do occur on the downbeats of bars 13-15 occur amidst ongoing gestures that lack internal points of articulation. To mentally mark the notated downbeats feels artificial, and disrupts the natural flow of the passage.

The solution is to hear the passage as if Beethoven had written three measures of $\frac{2}{4}$ or a single measure of $\frac{3}{2}$, rather than four measures of $\frac{3}{8}$; that is, to hear the $\mathbb{\text{♪}}$ units grouped duply at three successive levels so as to project a $\mathbb{\text{𝅗𝅥}}$ pulse, which conflicts with and momentarily overrides the notated $\mathbb{\text{𝅗𝅥.}}$ downbeat pulse.

Figure 2 numbers the sixteenth notes from 0 to 24, which respectively mark the arrival of the dominant and its resolution to tonic. The notated downbeats are multiples of six; the phenomenal accents from which the alternative meter is constructed occur at multiples of eight.

[20] Artur Schnabel, *My Life and Music* (New York: Dover Publications, 1988), xiii.

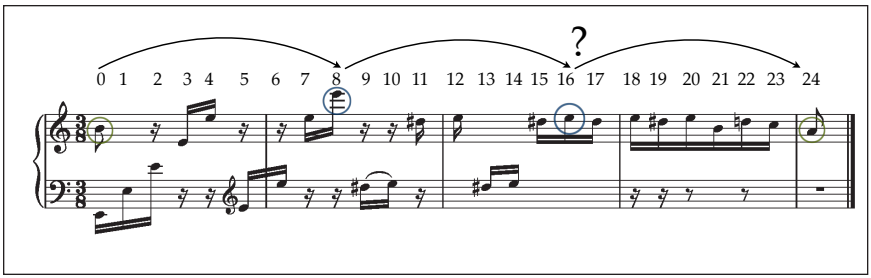


Figure 2. "Für Elise," mm. 12–15, with superimposed half-note pulse

Point 8 is where the octave gesture completes, just before the D♯/E alternation is launched. It naturally accrues a phenomenal accent, as the apex of the gesture and indeed the highest pitch of the piece so far. Point 16 is more problematic. In its own context, it bears the same problem as the downbeats of bars 13 and 14: the D♯/E alternation just drives right through and keeps on going. But the larger musical context provides a strong motivation for hearing an articulation at point 16: this is the moment when the reprise is re-engaged. Once the passage is heard in this way, the D♯/E alternation locks into the projected 𝅗𝅥 pulse, and there is no reason to play any more or fewer notes than what Beethoven wrote.

This solution has a consequence for how we hear the eight-beat anacrusis elsewhere in the composition, including at its opening. Musical cognition mandates that we hear "parallel passages in parallel ways."[21] Overriding this mandate taxes cognitive resources as much as artificially pumping accents onto the notated downbeats of bars 13–15. Accordingly, we have strong reason to hear the opening eight-beat anacrusis as beginning at a metrically accented point, and projecting a 𝅗𝅥 pulse, as if it were beginning on beat 2 of an incomplete $\frac{3}{4}$ measure. This hearing, too, follows naturally from the shape of the passage: the only motivation to accent the E on the downbeat of m. 1 is that it follows a bar line. The accentuation that would normally accrue to that point is siphoned both an ♪ earlier, to the accent of initiation in bar 0, and an 𝅗𝅥 later, to the point where the descent to A is launched. This interpretation of the anacrusis is then inherited each time that it returns, including at mm. 4–5 and at the lead-back from bar 8a to the repeat of the opening. In both these latter cases, the anacrusis occurs on beat 2 of a *complete* $\frac{3}{4}$ measure.

My goal here is to suggest how a systematic approach to meter

[21] Fred Lerdahl and Ray Jackendoff, *A Generative Theory of Tonal Music* (Cambridge: MIT Press, 1983), 75.

will help performers to negotiate a passage that is cognitively challenging. That said, though, once one learns to hear a passage in a particular meter, it is difficult to unlearn it, and difficult to project some other meter in performance. And this metric interpretation is likely to have further consequence for the theme as a whole. If bars 4–5 triply group a ♩ pulse across two measures, and bars 12–15 triply group a 𝅗𝅥 pulse across four measures, what of the six measures that separate these two passages? They consist of two three-bar units, the first of which ends the first reprise (bars 6–8b), and the second of which begins directly after the double bar (bars 9–11). These six measures all project the notated ♩. downbeat pulse clearly, and so it is the ♩. pulse that is triply grouped. This suggests hearing the three-counted units as participating in a process of incremental expansion, as follows:

bar 2:	♪ pulse triply grouped	across 1 bar
bar 3:	♪ pulse triply grouped	across 1 bar
bars 4–5:	♩ pulse triply grouped	across 2 bars
bars 6–8:	♩. pulse triply grouped	across 3 bars
bars 9–11:	♩. pulse triply grouped	across 3 bars
bars 12–15:	𝅗𝅥 pulse triply grouped	across 4 bars

The same expansion occurs again when the reprise leads back to the repetition of the theme's second part.[22] Figure 3 graphically summarizes this hearing.

[22] Scott Murphy introduces the three-counting heuristic in "On Metre in the Rondo of Brahms's Op. 25," *Music Analysis* 26, no. 3 (2007): 323-353.

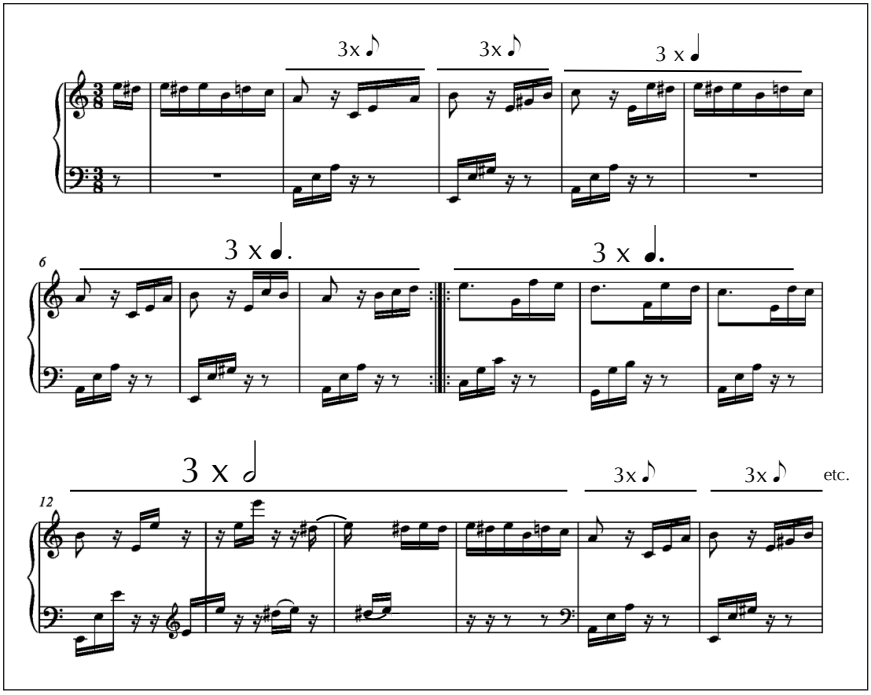


Figure 3. "Für Elise" theme, with expanding triple meters, first version

This analysis assumes that bars 2 and 3 conform to the $\frac{3}{8}$ meter signature. However, many performers instead project, and many listeners entrain to, a $\dot{\text{♪}}$ pulse in bars 2–3 and similar passages, thus triply grouping the sixteenth note rather than the eighth. According to this hearing, the triple grouping of ♪ "jumps" directly to the triple grouping of $\dot{\text{♩}}$, omitting the triple grouping of $\dot{\text{♪}}$ that is mandated by Beethoven's meter signature, and the $\frac{3}{8}$ meter does not appear until the first episode. Bisection of bars 2 and 3 is supported by Beethoven's 1822 recomposition of "Für Elise," which introduces a textural accent at the midpoints of these and similar bars.[23] Figure 4 provides a graphic summary of the metric expansion across the opening 16 bars of "Für Elise," according to this latter hearing.

[23] See Barry Cooper, "Beethoven's Revisions to 'Für Elise,'" *The Musical Times* 125, no. 1700 (1984): 561–563. The $\dot{\text{♪}}$ pulse is also clearly heard by the author of the contrafactum text in a 1986 commercial for hamburgers: "Oh I wish I were already there, instead of here, playing this song." See https://www.youtube.com/watch?v=-2yklZeEbFE.

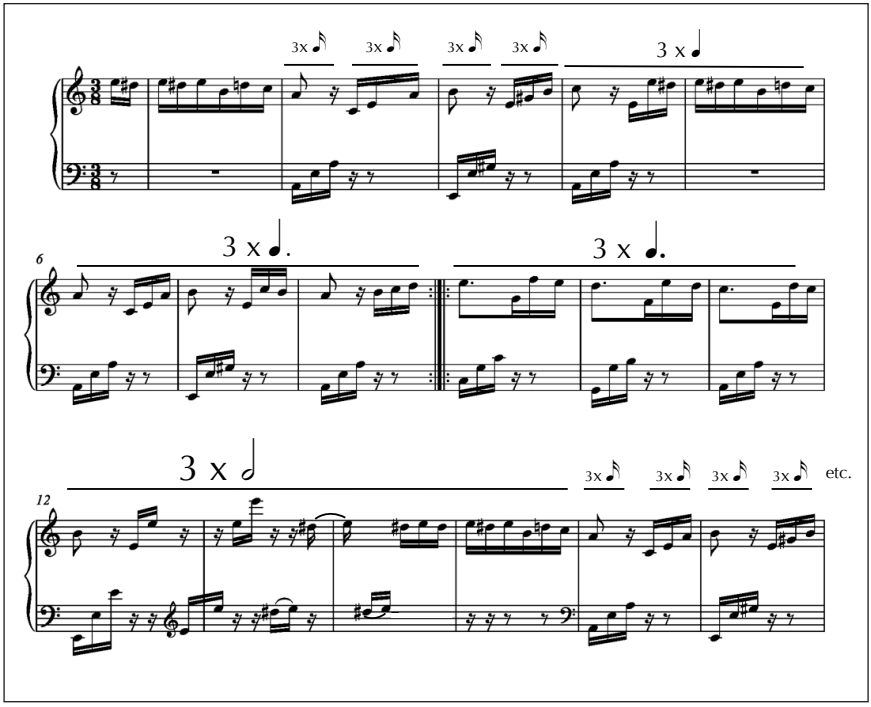


Figure 4. "Für Elise" theme, with expanding triple meters, second version

From this investigation of an 'easy' piece for novices, one might infer that metric analyses of other compositions that we have long known, and think we know completely, will also invite us to hear them in ways that might not have occurred to us otherwise. As music theorists, we can model a method for exploring the ubiquitous dynamics of metric complexity, and give young musicians the technical capacity to launch their own explorations. Is it possible that the value they gather from such explorations might equal the value they gather from learning to properly double $\frac{6}{3}$ chords, avoid augmented seconds, distinguish German from Italian sixths, identify hybrid periods, and recognize all-combinatorial hexachords? Perhaps even exceed that value?

The Archaeologist's Paradise: Digging Through Solo-Polyphonic Ambiguity in the Counterpoint Classroom

By Michael Callahan

J. S. Bach's richly understated compositions for solo violin, solo cello, and solo flute demand limber approaches to performance, to analysis, to listening, and to teaching. While my students play solo Bach (or its transcriptions) on nearly every single-line instrument, many of them lack strategies for understanding its contrapuntal complexity—which often supports multiple potential hearings—and for translating this understanding into decision-making as listeners or performers. Both the challenge and the allure of solo polyphony reside in the interaction between the fixed fragments of a monophonic surface and the active, highly variable work of an imaginative listener—or, put differently, in the archaeological way in which one must interpret and infer from, rather than simply take at face value, the sounding artifacts. The richness of these works derives from what can be, and what *must* be, done to them aurally in order to hear them as normative instances of tonal counterpoint, and in the manifold opportunities offered by their ambiguities.

A poem offers an inexact but still suggestive analogy. Consider how a reader might engage with the haiku in Example 1, which presents vivid images but without a verb, a clear perspective, or an explicit meaning. One interpretive approach is a reconstructive one, aimed at clarifying a reading of the poem by filling in its gaps and thereby making explicit what is left to the imagination—that is, an explanation of the poetry in prose. Many illuminating analyses of solo Bach show, through either figured bass or voice-leading sketches, the contrapuntal prose that is latent in (or realized by) the solo-polyphonic poetry.[1] The benefits of doing so are substantial: it

[1] Examples of this type of analytical approach include voice-leading sketches in David Beach, *Aspects of Unity in J. S. Bach's Partitas and Suites: An Analytical Study* (Rochester: University of Rochester Press, 2005); Carl Schachter, "The Gavotte en rondeaux from J. S. Bach's Partita in E Major for Unaccompanied Violin," *Israel Studies in Musicology* 4 (1987): 7–26; Carl Schachter, "The Prelude from Bach's Suite No. 4 for Violoncello Solo: The Submerged Urlinie," *Current Musicology* 56 (1994): 54–71; and in Schenker's essays on Bach's solo violin and solo cello music in Vols. I and II of *Das Meisterwerk in der Musik*. Other examples include figured-bass abstracts in David Ledbetter, *Unaccompanied Bach: Performing the Solo Works* (New Haven; Yale University Press, 2009); voice-leading sketches

realigns and completes the diffuse "notes" of the surface into the crystalline focus of "tones."[2] As a result, it allows the music to be examined in relation to standard contrapuntal devices and permits the observation of subtle, sub-surface relationships. By the same token, the limitation of a single normalization is that it irons out any potential ambiguities, clarifying them rather than emphasizing their potential for divergent hearings.

From across the lake,
Past the black winter trees,
Faint sounds of a flute.

Example 1. Haiku by Richard Wright[3]

A second (and complementary) approach to a poem might focus on the words at its surface, observing sonic connections such as alliteration, rhyme, and poetic meter. It is in this light that I see the compound-melodic analyses of Ernst Kurth, which highlight non-contiguous stepwise paths of the *Scheinstimme* and sensitively observe their interactions with the sounding *Realstimme*, but treat harmony and counterpoint as emergent from, rather than generative of, melody.[4] More recently, Stacey Davis has employed an empirically based algorithm for segmenting implied polyphony, as she calls it, into distinctly perceived streams.[5] She places important attention on the note-to-note melodic contours of this music, and points out

and thoroughbass progressions in Joel Lester, *Bach's Works for Solo Violin: Style, Structure, Performance* (Oxford: Oxford University Press, 1999); and voice-leading accompaniments aligned with the original surface in Allen Winold, *Bach's Cello Suites: Analyses and Explorations* (Bloomington: Indiana University Press, 2007).

[2] William Rothstein, "On Implied Tones," *Music Analysis* 10, no. 3 (1991): 298–328.

[3] Richard Wright, "Fourteen Haikus," *Studies in Black Literature* 1 (Autumn 1970): 1.

[4] Ernst Kurth, *Grundlagen des linearen Kontrapunkts: Bachs melodische Polyphonie* (Berne: Drechsel, 1917). For further eludication of Kurth's analyses of solo Bach, see Lee Rothfarb, *Ernst Kurth as Theorist and Analyst* (Philadelphia: University of Pennsylvania Press, 1988), 78–107.

[5] Stacey Davis, "Implied Polyphony in the Solo String Works of J. S. Bach: A Case for the Perceptual Relevance of Structural Expression," *Music Perception* 23, no. 5 (June 2006): 423–46.

resultant rhythmic relationships, although her algorithm is derived from stream-segregation research that is not explicitly rooted in tonal-contrapuntal tendencies and syntax.[6] My primary interest here is how we could *choose* to hear this music (and teach others to *choose* to hear it) as a perhaps concealed, but nonetheless true instance of tonal counterpoint—especially, in fact, when this choice is deliberate, effortful, or even challenging.

A third analytical approach to the poem might focus directly on its ambiguities, considering what causes them and exploring the interpretive options that they offer to an active and imaginative reader: Are the sounds of the flute subjects or objects? Who or what is across the lake? Does the blackness of the trees symbolize something? What? (This short list leaves aside inquiries into the poem's broader, contextual meanings.) These and other questions would situate the poem at the center at a co-creative dialogue between the given words and the ideas supplied by the reader—or, brought back to music, between what sounds and what is audiated.[7] It is in this way that I deal with solo polyphony here, suggesting that we cast ambiguity in a starring role in the pedagogy of this music within a counterpoint curriculum.[8] Focusing mainly on Bach's Partita in A Minor for Solo Flute, I consider the following questions: What role do a listener's choices play in interpreting various types of solo-polyphonic ambiguity? By characterizing and rehearsing solo-polyphonic listening strategies, can we open up possibilities

[6] The discussion of rhythm appears in Stacey Davis, "Stream Segregation and Perceived Syncopation: Analyzing the Rhythmic Effects of Implied Polyphony in Bach's Unaccompanied String Works," *Music Theory Online* 17, no. 1 (April 2011), http://www.mtosmt.org/issues/mto.11.17.1/mto.11.17.1.davis.html.

[7] Edwin E. Gordon, *Learning Sequences in Music: A Contemporary Music Learning Theory*, 8th ed. (Chicago: Gia Publications, 2012). Gordon defines "audiation" by analogy: "Audiation is to music what thought is to language" (ix), stressing that audiation includes the act of giving meaning to what sounds. I appropriate the term here in order to capture the act of creating an internal hearing of solo polyphony that is responsive to (and inclusive of) what sounds, but not strictly limited to it.

[8] For a sensitive discussion of solo-polyphonic ambiguity, see Lester, *Bach's Works for Solo Violin*, 141–43. Lester discusses ambiguity with regard to the Allemande and its Double in the Partita in B Minor for Solo Violin. He sensitively problematizes the clarifying effect that the Double can have, and speculates on whether this ought to inform the performance of the Allemande.

for multiple hearings of solo Bach, and thereby enrich students' aural engagement with it? Finally, through which activities, both within and outside of class, can these skills be taught in the trenches of a counterpoint course?

The motivation behind these questions is practical: almost every instrumentalist in my counterpoint classes during the last six years has reported performing solo Bach or its transcriptions for woodwind, brass, and pitched percussion. I aim to provide them with an apparatus for making sense of it—as listeners, by extension as performers, and, in my classes, as fledgling composers.[9] In general, the presentations of solo Bach in textbooks portray it as more straightforward than it often is, which stems from an insufficient distinction between *solo polyphony*, in which the constraints of a single sounding voice render it susceptible to the kinds of ambiguity discussed below, and the more ubiquitous technique of *compound melody*, which is seldom ambiguous when, for example, a compound-melodic upper voice sounds above a basso continuo.[10] Clear-cut passages from solo Bach (e.g., the openings of the Prelude and second Menuet of the G Major Cello Suite) prevail in pedagogical texts; while an understanding of compound melody is sufficient for understanding how these relatively transparent single lines imply multiple voices, a more fulsome pedagogical approach is necessary for equipping students to wrestle with the more nuanced features of solo polyphony.

Some undergraduate texts, such as those by Aldwell, Schachter, and Cadwallader and by Kostka, Payne, and Almén, do not deal

[9] I have used this method to guide a unit of about four weeks in length within a counterpoint course. Spending 20–25 percent of the semester on these techniques is justified, I have found, by both the complexity of the subject and the fact that solo polyphony is one of the only contrapuntal techniques that directly informs the performance of students from nearly every instrument background.

[10] In the latter sense, compound melody is well accounted for historically; see, for instance, the approach to diminution in Giorgio Sanguinetti, *The Art of Partimento: History, Theory, Practice* (New York: Oxford, 2012), 185–88. For a fulsome historical account of compound melody, see Stacey Davis, "Implied Polyphony in the Unaccompanied String Works of J. S. Bach: Analysis, Perception, and Performance" (PhD diss., Northwestern University, 2001), 38–60.

explicitly with compound melody.[11] Burstein and Straus's text expects students to reduce a compound melody to its harmonic basis and to do the opposite in composition exercises, but does not deal with solo-polyphonic pieces.[12] Clendinning and Marvin's workbook includes compound-melodic composition exercises (e.g., horizontalizing four-part progressions into keyboard textures), but engagement with solo-polyphonic pieces is limited to brief analytical tasks (e.g., identifying bass lines and sequence types).[13] The treatment of compound melody in Roig-Francoli's text does focus in part on solo textures, and exercises include both analysis and composition of single-line polyphony.[14] The most comprehensive treatment is by Laitz, who includes exercises in verticalizing and horizontalizing harmony throughout the curriculum. He also includes solo pieces in an appendix on compound melody, noting how they can imply multiple voices and briefly mentioning that voices sometimes need to be inferred when they do not actually sound. The analytical and compositional activities do not deal explicitly with ambiguity or divergent interpretations, however.[15] Among counterpoint textbooks, Schubert and Neidhöfer briefly mentions compound melody and includes reduction, but does not distinguish it from solo polyphony.[16] Benjamin's brief treatment of compound melody asks students to orchestrate solo polyphony into

[11] Edward Aldwell, Carl Schachter, and Allen Cadwallader, *Harmony and Voice Leading*, 4th ed. (Boston: Schirmer, Cengage, 2011); Stefan Kostka, Dorothy Payne, and Byron Almén, *Tonal Harmony with an Introduction to Twentieth-Century Music*, 7th ed. (New York: McGraw-Hill, 2013).

[12] L. Poundie Burstein and Joseph N. Straus, *Concise Introduction to Tonal Harmony* (New York: W. W. Norton and Company, 2016).

[13] Jane Piper Clendinning and Elizabeth West Marvin, *The Musician's Guide to Theory and Analysis*, 3rd ed. (New York: W. W. Norton and Company, 2016). See, in the workbook, pp. 224, 281–82, and 293–94.

[14] Miguel A. Roig-Francoli, *Harmony in Context*, 2nd ed. (New York: McGraw-Hill, 2011), 318–20.

[15] Steven G. Laitz, *The Complete Musician: An Integrated Approach to Tonal Theory, Analysis, and Listening*, 4th ed. (New York: Oxford University Press, 2016). See Appendix I (online) and, in particular, pp. 655–58 of Workbook 1.

[16] Peter Schubert and Christoph Neidhöfer, *Baroque Counterpoint* (Upper Saddle River, NJ: Pearson/Prentice Hall, 2006), 45–48.

distinct parts, as if played by multiple instruments in alternation.[17] Gauldin's counterpoint manual includes a handful of exercises in reducing and writing compound lines, but discussion of solo-polyphonic pieces is limited to straightforward examples and does not present techniques for writing solo polyphony.[18] Finally, Schenkerian surveys by Forte and Gilbert, and Cadwallader and Gagné discuss straightforward passages from solo Bach within discussions of "compound melody" and "polyphonic melody," respectively, and the former mentions implied tones that are not literally present.[19]

When examples of solo polyphony (as opposed to compound melody in general) do appear in these texts, they are most often straightforward cases; discussions of them are brief and are not targeted narrowly at a specific set of solo-polyphonic writing techniques, or at the interpretation of ambiguity or multiple readings. However, solo Bach is saturated with trickier passages that leave even the most basic musical elements, such as chord identity, cadence types, and harmonic rhythm, up for grabs. Solo polyphony deserves special pedagogical attention because of the essential role played in it by the choices of a listener. My motivation is to teach, through analytical discussions and compositional etudes, listening strategies that empower students to interpret (i.e., co-determine) the ambiguities that pervade this music. By experimenting with these listening strategies in class, and exploring their compositional and analytical ramifications on assignments, students develop an apparatus for interpreting not only the clear examples, but also the richer and more listener-determined ones.

Discussions of musical ambiguity are numerous. In this context, I take as a departure point Gary Karpinski's essay on ambiguity, in which he clarifies that ambiguous means multi-stable, not vague.[20]

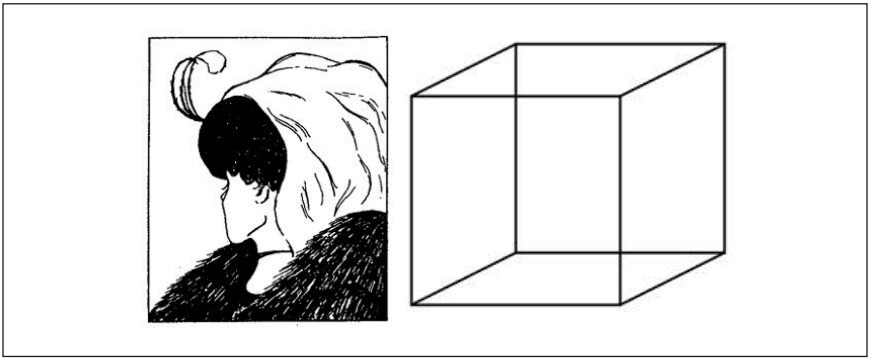
[17] Thomas Benjamin, *The Craft of Tonal Counterpoint*, 2nd ed. (New York: Routledge, 2003), 30–32.

[18] Robert Gauldin, *A Practical Approach to 18th-Century Counterpoint* (Long Grove, IL: Waveland, 2013), 28–32.

[19] Allen Forte and Steven E. Gilbert, *Introduction to Schenkerian Analysis* (New York: W. W. Norton and Company, 1982), 67–80; Allen Cadwallader and David Gagné, *Analysis of Tonal Music: A Schenkerian Approach*, 3rd ed. (New York: Oxford, 2011), 20–22.

[20] Gary Karpinski, "Ambiguity: Another Listen," *Music Theory Online* 18, no. 3 (September 2012), http://www.mtosmt.org/issues/mto.12.18.3/mto.12.18.3.karpinski.html.

Ambigrams such as the Necker cube and the old and young lady are good visual analogies (see Example 2): two different figures can be seen in each, although they are mutually exclusive. As a frame for the unit, students and I discuss what is at stake in these images: to see the horizontal line in the figure on the left as either a mouth or a necklace, for example, requires the active imagination of features that do not appear explicitly (i.e., the old woman's nostrils, the young woman's away-facing visage). In the cube, converting two given dimensions to three perceived dimensions requires interpreting the Z-axis as distorted either southwest or northeast. Solo polyphony is not vague in the sense of being ungoverned by contrapuntal procedures and schemata typical of the eighteenth century; it is, at times, multi-stable, capable of providing the starting point for more than one plausible, specific interpretation, each one reliant on active listening.[21]



Example 2. Ambigrams

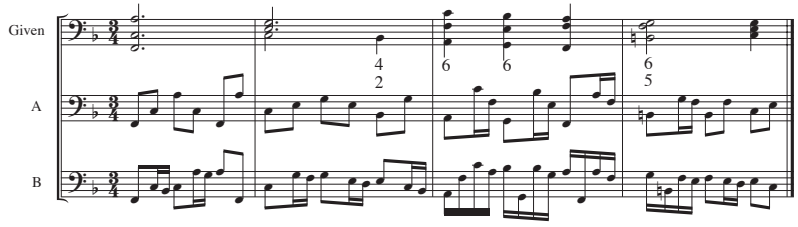
[21] This explanation of ambiguity and these visual analogies help to reorient students who enter with a straightforward view of analysis toward an analytical process that is—suddenly for many of them—far more up for grabs. William Perry's model of intellectual development helps to account for students who enter the curriculum in a dualist mentality, searching for single, correct answers; moving them toward multiplicity (i.e., the acknowledgment of more than one possible answer) and eventually relativism (i.e., the weighing of alternatives as more or less valid using defined criteria), is a principal goal of the analytical work discussed here. See William G. Perry, *Forms of Intellectual and Ethical Development in the College Years: A Scheme* (New York: Holt, Rinehart, and Winston, 1970).

The rest of this article divides into three sections, each of which presents both analytical commentary and written exercises with sample solutions: first, a set of solo-polyphonic basics intended to extract distinct compositional techniques out of simple repertoire models, and then treatments of two important types of ambiguities caused by the incompleteness and the asynchrony of solo polyphony (or both). The analyses, which are framed explicitly from the perspective of a solo-polyphonic listener, serve a dual purpose: they highlight specific pedagogical issues for the sake of clarity to the reader, but also summarize the in-class, aural-analytical explorations that students engage in. These complement the compositional etudes, which apply analytical techniques toward creative writing. Thus, the interested reader could take away concrete ideas for teaching solo polyphony both within and outside the classroom.

Solo-Polyphonic Fundamentals

I aim to teach students that solo polyphony is not synonymous with figuration preludes; our first set of compositional exercises enacts a writing process of cumulative sophistication, in which students become aware of the techniques responsible for the difference between bland arpeggiation and more fluid realizations. At the same time, analytically, my most important learning objective is that students know how to reckon with solo-polyphonic passages that do more than simply arpeggiate, especially ones that conceal implied voices by omitting them, changing their register, or connecting them together. My intent below is not to claim anything new about passages analytically, but rather to show how the basic techniques of solo-polyphonic writing can be disentangled from one another pedagogically and then each connected to compositional activities that set the stage for more sophisticated work. The uppermost staff of Exercises A and B shows a three-voice contrapuntal framework with figured bass symbols, which underlies several realizations that students compose for whichever bass-clef instrument they know best (such as cello, bassoon, euphonium, marimba, or baritone saxophone notated in

concert pitch).[22] Exercises A–F are not intended as an evolutionary algorithm for generating a desired end-product in line F, but rather as a way of ensuring that students discover multiple solutions of varying complexity.



Instructions for Exercise A: Leaving the bass voice first within each harmony, move the upper voices later in time to sound one at a time as part of a single line. Leap between notes that belong to different contrapuntal voices.

Instructions for Exercise B: Add neighboring motions within contrapuntal voices and, in some harmonies, move the bass voice later in time to sound after one or more of the upper voices.

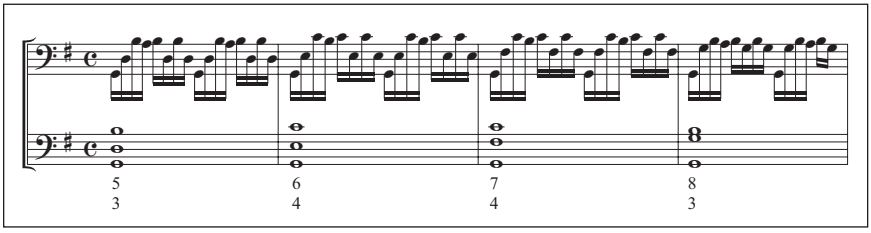
Exercises A and B

The most basic task of solo-polyphonic writing is to take the three-voice framework on the upper staff and stagger the voices rhythmically to create a single line, as in Exercise A. Students are instructed, for now, to keep the bass voice sounding as the first pitch within each harmony in order to preserve maximal clarity. This restriction is relaxed later (see Exercise B, mm. 3–4), but explicitly so, in order to emphasize the primacy of the bass voice and the additional aural challenge posed when upper voices sound prior to the bass against which they are reckoned. The next most basic task, shown in Exercise B, is to add neighbor-note embellishments *within* voices that do not blur the boundaries between adjacent

[22] I see it as important in this early stage to provide not only a figured bass, but also a set of voices to be implied. This accomplishes two things: it emphasizes that solo polyphony is about projecting multiple lines, not simply arpeggiating chords, and it allows the instructor to craft a set of upper voices that feature some variety with regard to spacing, requiring students to navigate wide spacings as well as ones that converge to within a step between adjacent voices.

voices. Here, I encourage students to make these within-voice embellishments motivically related to the extent possible, as in the lower-neighbor figure employed throughout mm. 1–2 and in m. 4, and the incomplete double neighbor that appears from m. 3 through the downbeat of m. 4. Another issue introduced at this stage is the occasional need to omit a voice when the harmonic rhythm is too fast to accommodate complete harmonies. A consistent surface rhythm is an important hallmark of solo polyphony, so it is important to warn students against simply speeding up the surface rhythm when the harmonic rhythm accelerates, in order to fit all of the voices in. (The reader will note that the sample realization in Exercise A fell into this trap in m. 3.) I ask students to privilege the outer voices when they cannot state every voice explicitly (e.g., Exercise B, m. 3, beats 2–3).

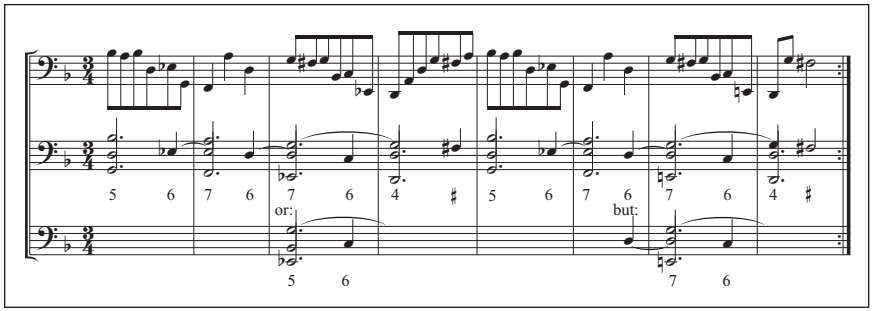
The well-known opening of the Prelude from Bach's Cello Suite in G Major (Example 3) models the simplicity targeted in Exercises A–B. The wide spacing between the three implied voices helps students to hear each of them distinctly; the appearance of the bass voice first within each measure and its long resonance on the cello clarify the contrapuntal context of the upper voices (i.e., over a tonic pedal); and the lower-neighboring embellishment within the upper voice demonstrates a straightforward way of introducing the technique rehearsed in Exercise B.



Example 3. J. S. Bach, Suite No. 1 in G Major for Solo Cello, Prelude, mm. 1–4

The second half of the sample realization in Exercise B displaces the bass rhythmically to sound after one or more upper voices within the same contrapuntal simultaneity. The opening of the second Menuet from the same suite (Example 4), which appears in many pedagogical presentations of compound melody, models this procedure well. Students note that, while the opening bass G is undoubtedly in effect throughout the first measure, its late appearance requires a more active approach to listening, since one must audiate the G from the start in order to make sense of the

opening B♭ as $\hat{3}$, and of the inner-voice 5–6 motion as occurring above a bass that still has not sounded. This contrasts with the relative ease of hearing m. 2, which requires only the retention of a bass that sounds early, rather than the pre-hearing of one that is yet to come.



Example 4. J. S. Bach, Suite No. 1 in G Major for Solo Cello, Menuet II, mm. 1–8

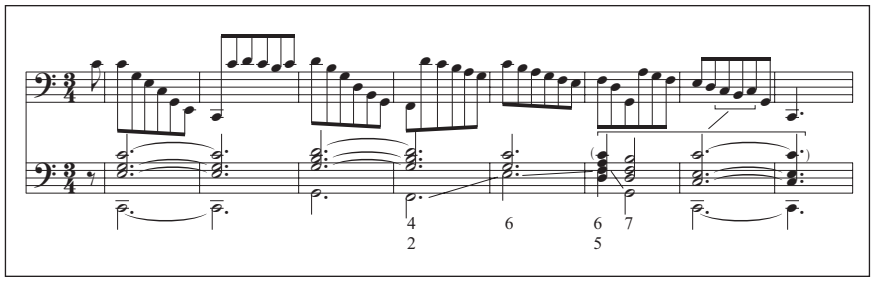
The same passage also supports discussion of implied suspensions in preparation for Exercise D. The 7–6 suspensions in m. 2 and m. 6, and in m. 3 and m. 7, are obligatory in order to avoid parallel fifths between the two upper voices. The former are simpler, requiring the retention of the preceding E♭ across the bar line and the change of harmony; the latter are somewhat more complex, since they require hearing a decorated resolution of the suspended D to C by means of the neighboring B♭.[23] During class time, we also work on more targeted etudes for preparing suspensions. I teach an algorithmic approach, modeled by the passage in Example 4, that involves reaching the upper-voice preparation, leaving it by leap so that it is retained, and then, within the following harmony but after the new bass note, returning either to the suspension and its resolution or to just the resolution.[24]

[23] An interesting in-class discussion can center on whether m. 3 implies 7–6 or 5–6—that is, whether the B♭ is present only for the eighth note when it actually sounds (as decoration of the suspended D), as shown on the middle staff, or, alternatively, since the very beginning of the measure (as part of 5–6 motion), as shown on the lower staff. The same option is not available in the corresponding place in m. 7, since the bass E♮ rules out the B♭ as a consonant 5th.

[24] For more detailed discussion of exercises of this type, see Michael Callahan, "Teaching Baroque Counterpoint through Improvisation: An Introductory Curriculum in Stylistic Fluency," *Journal of Music Theory Pedagogy* 26 (2012): 1–39, especially examples 10–11.

Concentrated within the first eight measures of the Courante from the C-Major Cello Suite (Example 5) are two issues crucial to an understanding of solo polyphony that moves past the basics. First, students can create more conjunct realizations by fusing two adjacent contrapuntal voices into a single melodic contour, filling in the registral space between them by means of stepwise motion and/or surplus consonances. For example, within the first eight sounding pitches of Example 5, it is not necessary to understand seven contrapuntal voices just because the arpeggiation moves through two octaves of tonic consonances; likewise in mm. 3–4, which also includes surplus consonances as a means of creating a smoother melodic contour and connecting across the two-octave ambitus. Distinguishing structural consonances from stepwise connective tissue is easy for students outside of solo polyphony, when the presence of other, unambiguous voices (often an ever-present bass) clarifies the function of each pitch as chordal, passing, neighboring, and so on. However, seeing the C4 and A3 of m. 4, and the B3, A3, and F3 of m. 5, as passing between the essential, contrapuntal voices of those measures—a basic concept—is trickier without the fixed referent of a bass because it counteracts students' melodic instinct to group an entire stepwise segment together as a single entity.[25] The challenge is greater in m. 5 than in m. 4, since the clarifying bass note (E3) comes at the end rather than at the start of the measure and is not registrally isolated.

[25] In this regard, the approach discussed here differs substantially from the algorithm presented in Davis, "Stream Segregation and Perceived Syncopation," for segmenting an implied-polyphonic melody into non-overlapping streams that, together, include each sounding pitch within exactly one stream. It can be challenging for students to locate the boundaries between contrapuntal *voices* when those boundaries fall within a melodic contour that is continuous enough to be considered a single stream (e.g., m. 5 of Example 5). To make this point explicit in class, I teach the essential tenets of Davis's approach as a way to distinguish voices that are clearly separated from those that are blurred together by contour. In her method, three principal factors govern the location of boundaries between streams, all of which are exemplified by the moment across the bar line between m. 4 and m. 5 in Example 5: a large melodic interval (and the larger the interval, the stronger the effect); a change of melodic contour from rising to falling or vice versa; and a stretch of stepwise motion surrounding the leap.

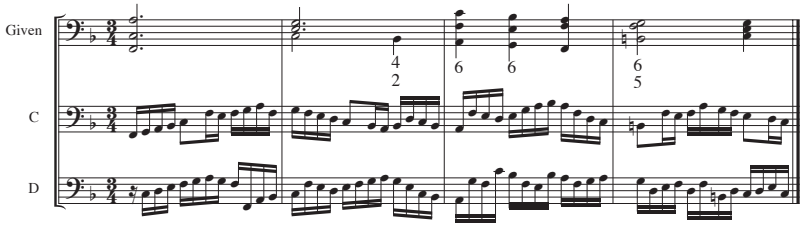


Example 5. J. S. Bach, Suite No. 3 in C Major for Solo Cello, Courante, mm. 1–8

A localized instance of blurring through surplus consonances takes place in m. 4 of the G-Minor Menuet as well (Example 4). Within the dominant harmony that occupies that measure, there are four consonant pitches present: the bass D2, the upper-voice F♯3, and both A2 and D3 in between them. Given the prevailing three-voice texture, the D3 makes more sense as an inner voice—it preserves stepwise motion across the bar line into m. 4, but the effect of the surplus A2 is not to be overlooked: it creates a continuous contour across the tenth separating outer voices, in contrast to the registrally isolated voices in the first three measures. Blurring between voices, whether through stepwise passing motion or via surplus consonances, can be one of the most confounding issues for students reckoning with solo polyphony, since it forces them to rely upon contrapuntal norms to distinguish the voices from the material connecting them, not permitting just a search for large leaps as boundaries. Compositional tasks that involve this fundamental act of blurring (Exercises C–D) are liberating, since they permit stepwise melodic designs that go beyond mere arpeggiation, but also potentially challenging, since it becomes trickier to project the intended counterpoint clearly in the presence of stepwise motion between voices. A few guidelines help students: leap only to and from consonances, since doing so tends to stabilize them; place important notes of the underlying counterpoint, especially the bass, in metrically strong positions most of the time; and include a sufficient number of leaps, since it is less effortful to imagine a contrapuntal pillar as retained if it is left by leap than by step. Exercise D adds implied suspensions to the blurring of voices introduced in Exercise C.[26] (In both, as in Exercise B above,

[26] The sample realization in Exercise D also models for students how non-adjacent pitches can jump out of a rhythmically undifferentiated texture based on registral proximity and parallel metrical placement. For example, beginning on the climactic C4 in m. 3 and ending on

it is occasionally necessary to omit one or more voices temporarily, especially to prepare or resolve an implied suspension.)



Instructions for Exercise C: In several places, fuse two or more contrapuntal voices into a single melodic contour by linking them together with stepwise motion and/or surplus consonances.

Instructions for Exercise D: Locate opportunities for 4–3 and 7–6 suspensions and imply them by leaving the preparation by leap, stating the new bass note, and returning either to the suspension *and* its resolution or just to the resolution.

Exercises C and D

The second basic issue exemplified by the Courante opening (Example 5) involves transferring a voice, especially the bass, to a different octave. When I first play the opening of the C-Major Courante for students and ask students which bass note follows the F2 on the downbeat of m. 4, a majority of them always say the G2 on beat 2 of m. 6—a contrapuntal impossibility that highlights their overreliance on superficial, registral connections and their insufficient consideration of contrapuntal principles.[27] Many of them initially fail to notice that, given the preceding context, the F2 is the seventh of a dominant $\frac{4}{2}$ harmony, compelled to resolve downward to an E2, even though the latter never appears. The E3 at the end of m. 5 acts as a surrogate, supporting the expected tonic harmony. The bass remains in the tenor register across the bar line into m. 6,

the downbeat of m. 4, the <C–B♭–B♭–A–A–G> contour in alternating sixteenths and dotted eighths stands out to create some coherence in what otherwise could be a chaotic series of large leaps.

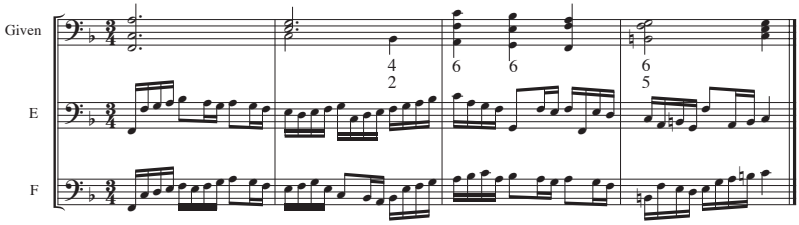
[27] A performer can get this moment wrong as well, I think, by hammering the F2 in m. 4, giving no special emphasis to the downbeat of m. 6, and then again hammering the G2 in m. 6.

leading to a predominant harmony on beat 1. The F3 at the start of m. 6 is a stand-in for a bass that, like the preceding bass E3, should be an octave lower (supporting ii$^{6}_{5}$); but the *same* F3, by the end of m. 6, has become an inner-voice chordal seventh between the bass G2, which has been returned to its original register, and the implied B3 in the upper voice. Thus, two bass notes in the middle of the progression (the E3–F3 of mm. 5–6) occur in the tenor register. The upper-voice C4 in m. 5 is abandoned: its obligatory continuation (in m. 6 to the leading tone and in m. 7 to the upper-voice tonic) is missing, but its implication is strengthened by the compensatory C–B–C in m. 7, albeit an octave lower and after tonic has already arrived.[28]

Exercises E–H get at the thorny issue of register from a variety of perspectives. Exercise E frees students to weave intermittently among the given contrapuntal voices, making some explicit while avoiding others to leave them implied, such that the same voices are not present in each change of harmony; compare m. 2, in which all voices sound, to m. 1, which omits the middle voice, and mm. 3–4, in which a mix of lower, then upper voices are omitted.[29] Exercise F then asks students explicitly to omit bass notes of the given framework that resolve tendency tones, and to compensate by transferring the bass into a higher register; see mm. 2–3, when the B♭2, a chordal seventh, is placated by the A3 on the following downbeat, and where the bass G2 and F2 on beats 2–3 of m. 3 are replaced by the melodically smoother realization an octave higher.

[28] The contrapuntal interpretation discussed here agrees with the one in Winold, *Bach's Cello Suites*, 63. It is far from being the only plausible one, however. In fact, there is a rewarding hearing that relies on a more archaeological listening strategy (outlined in the following section of this article) to hear a characteristic cadential hemiola in mm. 5–6. Imagine in the bass, beginning on the downbeat of m. 5, a half note E2, quarter note A2, quarter note F2, half note G2. While more effortful, this alternate hearing is alluring.

[29] The *fonte* sequence in the last 8 measures of Bach's G-Minor Menuet (the same movement as in Example 4) is a great model of this process. In a sequence that tonicizes C minor, B♭ major, and then G minor, the lowest sounding bass notes of each measure are B2–E♭3–A2–D3–F♯2–B♭2, which demands that students hear implied bass notes of C3, B♭2, and G2 in the second, fourth, and sixth measures, respectively. (These implied resolutions of the preceding leading tones, not unusually, are assisted by compensatory appearances of the implied tones an octave higher at the *ends* of these three measures.)



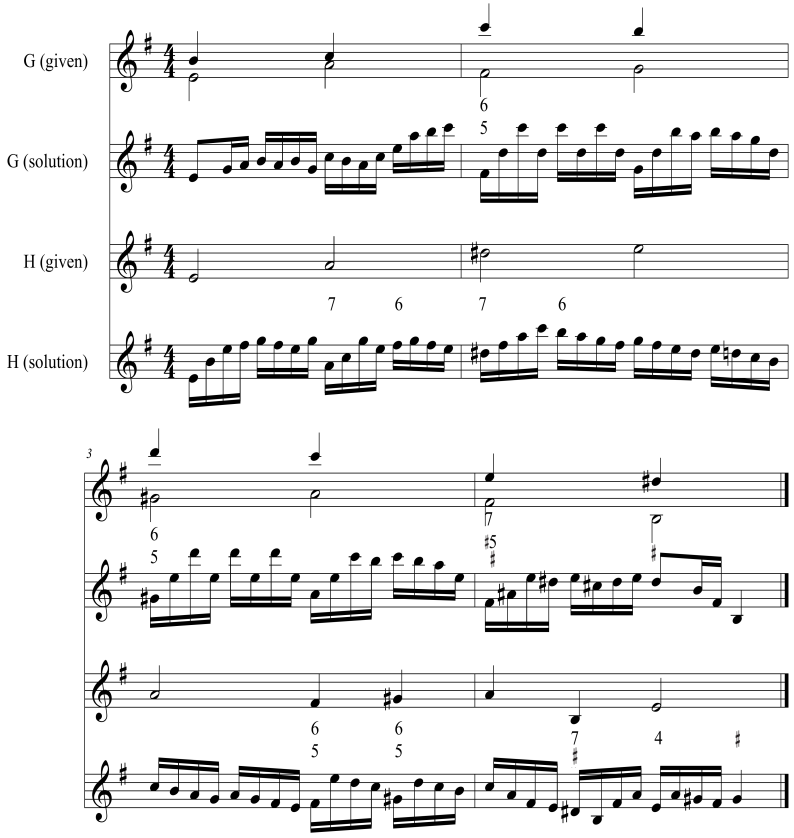
Instructions for Exercise E: Weave intermittently among the given contrapuntal voices, making some explicit while leaving others implied, such that the same voices are not present in each harmony.

Instructions for Exercise F: Omit one or more notes of the bass voice, taking care to compensate for omitted resolutions of tendency tones by stating them soon after in a higher register.

Exercises E and F

Exercise G instructs students to prepare new registers through incidental arpeggiation prior to the change of harmony that introduces them as essential voices; see just before the bar lines into m. 2 and m. 4. Finally, Exercise H treats the issue more generally by providing a figured bass with large registral gaps and asking students to smooth them over by creating one voice that becomes another voice. When the bass leaps much higher, as into m. 2, the bass enters the register of a former upper voice and dovetails with it (as in Example 5, m. 5). When the bass leaps downward, as into m. 3, the previous bass turns into an upper voice (as in Example 5, m. 6, and Exercise F, into m. 4).[30]

[30] All of the compositional exercises, especially ones as sophisticated as this, are previewed through in-class workshop prior to being assigned as homework.



Instructions for Exercise G: Preserving the given outer voices, smooth out the large intervals between soprano pitches by preparing (i.e., activating) the upcoming register within the previous harmony. Smooth it out further by including a middle voice within the second measure that keeps alive the register that was the soprano in the first measure (i.e., high within the staff).

Instructions for Exercise H: Realize the disjunct figured bass smoothly in solo polyphony. When the bass suddenly leaps much higher, craft a smooth transition so that a previous upper voice becomes the bass at that point. When the bass suddenly leaps much lower, craft a smooth transition so that the previous bass becomes an inner voice over the new bass note. Resolve tendency tones appropriately.

Exercises G and H

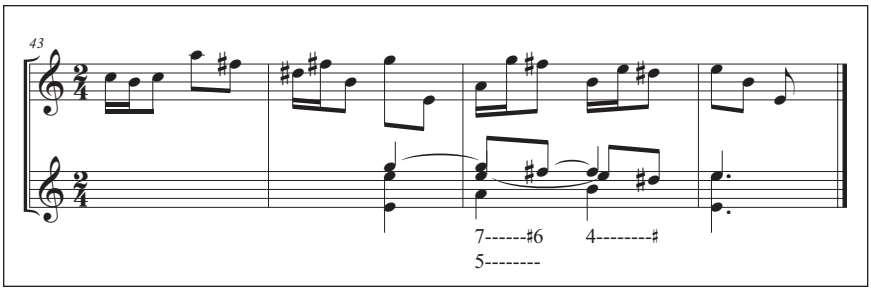
The Literalist and the Archaeologist

One of the most pervasive challenges of hearing solo polyphony is the need to decide how polyphonic it actually is at each point in time—that is, how much of a contrapuntal texture is portrayed by the sounding notes. Is a complete polyphonic structure sounding, or just a partial one? At stake here is a decision regarding what must be done, aurally, to make contrapuntal sense of what sounds: should it be just realigned, or also accompanied to some degree by audiating one or more missing voices? To train these different modes of engaging with solo polyphony, I define two listening strategies for my students as two ends of a continuum: the literalist, who assumes that the sounding music constitutes a self-sufficient polyphonic texture, and aurally realigns (but does not add to) what sounds; and the archaeologist, who interprets the sounding music as just fragments of the texture, most often with the bass missing, and aurally accompanies it.[31] Following the foundational work in the preceding section, my goal is to help students to experiment with these two general approaches, often switching from one to the other as the music moves along. They are not intended as a binary opposition; there may be many plausible hearings, some more archaeological than others and some equally so but contradictory. To music that leaves so much contrapuntal agency to the decisions of the listener, I see these modes of listening as indispensable.

A common instance in the solo works of Bach is the unaccompanied cadence, in which closure is reached through an intact upper voice while an implied bass is either fragmentary or even missing altogether. In class, we examine a handful of cadences from the Bourrée Anglaise of the Flute Partita, which lie on a continuum from fully accompanied (i.e., with all voices actually sounding) through unaccompanied (i.e., requiring the active imagination of the listener). The cadence in mm. 44–46, shown on the upper staff of Example 6, is explicitly accompanied; downbeat bass notes clarify the implied suspensions in the two upper voices. A literalist listening strategy, shown on the lower staff, is appropriate here.[32]

[31] The notion of aural predispositions or personalities as biases for interpreting ambiguous passages is taken from Andrew Imbrie, "'Extra' Measures and Metrical Ambiguity in Beethoven," in *Beethoven Studies*, ed. Alan Tyson (New York: Norton, 1973), 45–66.

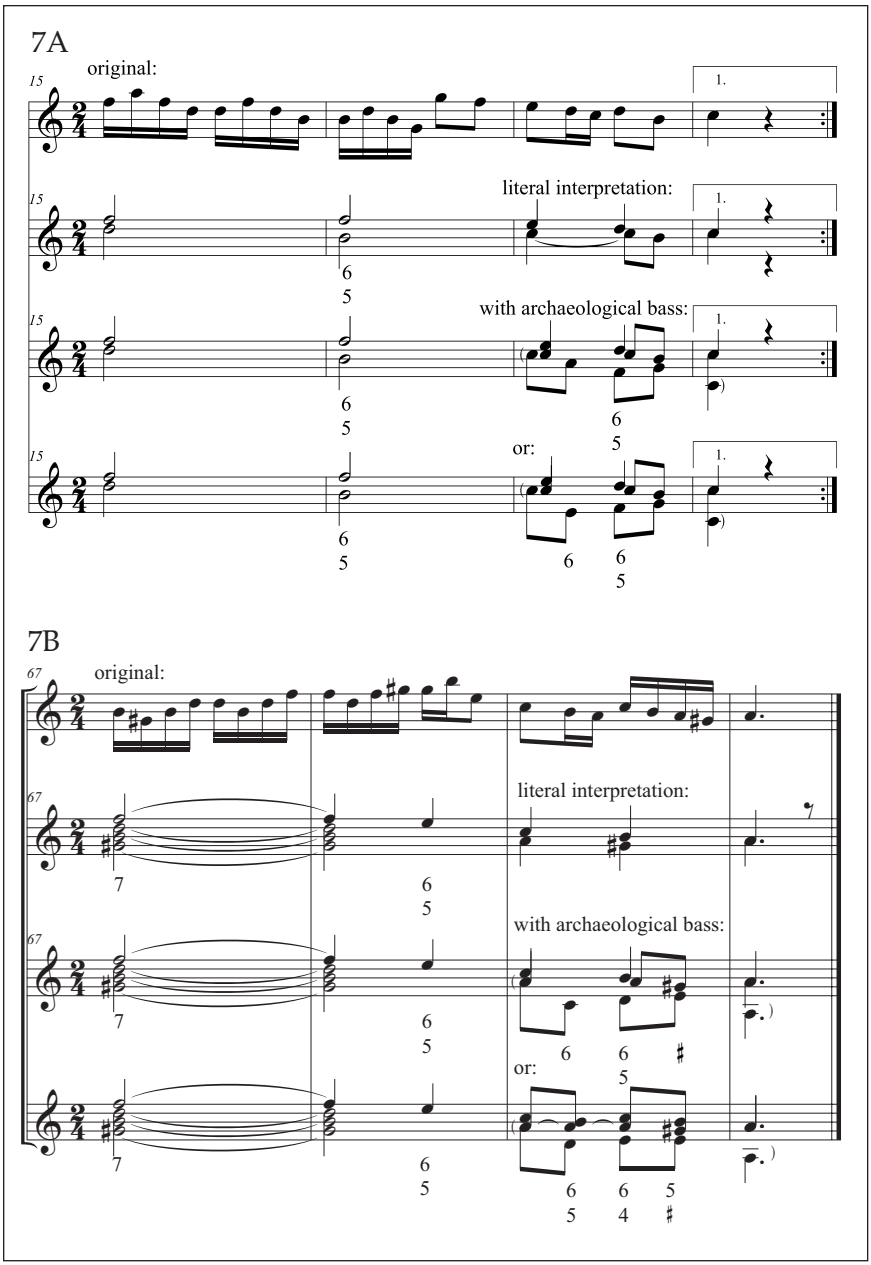
[32] Throughout our in-class discussions of these listening strategies, I find it helpful to spend time playing and singing together through both



Example 6. Accompanied cadence: Partita in A Minor for Solo Flute, Bourrée Anglaise, mm. 43–46 (upper staff), with literal hearing (lower staff)

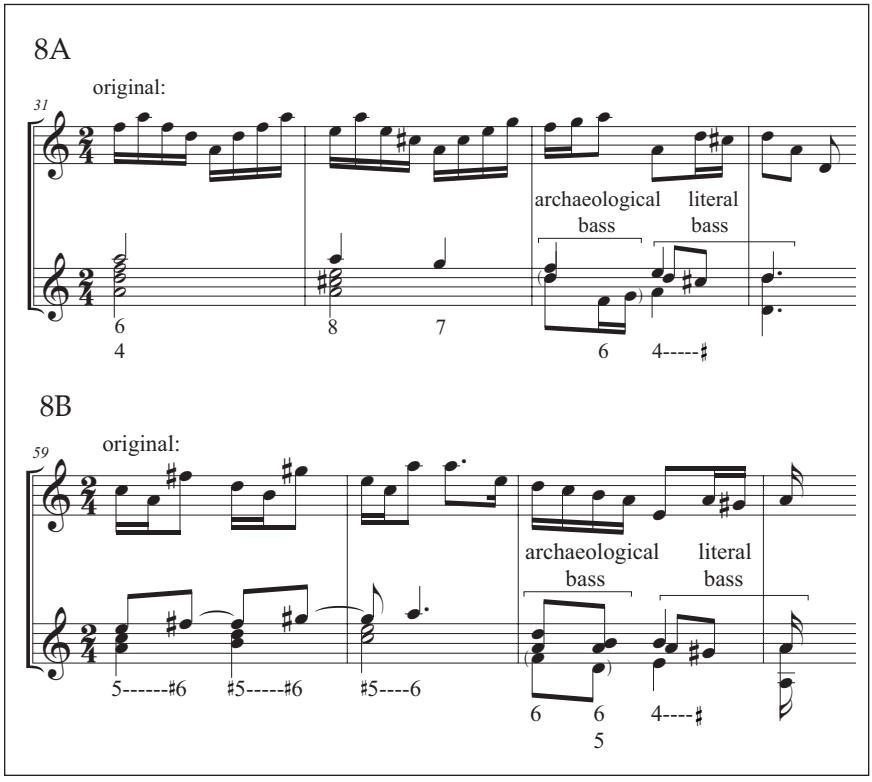
At the other extreme are the cadences at the ends of the movement's two reprises (Examples 7A and 7B, upper staves), in which an unbroken upper voice achieves strong melodic closure, but without any sounding support from a bass. In these, as is common, the bass drops out at the start of each cadential progression—it sounds just before, as shown in the contrapuntal reductions on the lower staves—leaving only upper voices through an implied predominant, dominant, and tonic arrival. A literal hearing (shown on the second staff of each excerpt) would offer a contrapuntal cadence with two voices converging by step on Î; however, this hearing would deprive the ends of these reprises of the strength of closure provided by a characteristic, cadential bass line (e.g., $\hat{4}$-$\hat{5}$-Î) in sync with the sounding melodic arrival on Î. A strong cadence requires an archaeological listening strategy different from that in Example 6, with a listener-supplied bass. Two potential hearings of this type are shown on the lowest two staves of each passage, and the difference between them is not just a theoretical conceit; my intent is for students to hear in these passages not just the basic tonal functions of tonic, predominant, and dominant—which are often clear even without any listener-supplied bass—but instead a detailed contrapuntal whole, inclusive of specific bass notes.

the original versions (using recordings and/or in-class performances by students) and the archaeological or literal interpretations of them—that is, alternating between what *sounds* and what I am asking students to *hear*. Students then reflect on whether they listen differently to the unaccompanied original as a result of this entrainment.



Examples 7A and 7B. Unaccompanied cadences: Partita in A Minor for Solo Flute, Bourrée Anglaise, mm. 15–18 and mm. 67–70, with archaeological basses (in parentheses)

In the middle of the spectrum are partially accompanied cadences, such as those at m. 34 and m. 62 (Examples 8A and 8B). As is common, both of these have sounding bass notes on the cadential dominant and tonic, but not prior, inviting an archaeological listening strategy at first and then a literal one just as the cadence arrives. In each case, the archaeologically supplied portion of the bass is crucial to the acceleration in harmonic rhythm that is characteristic of Baroque cadences. In m. 33, the downbeat F5 is a resolution of the upper-voice dominant seventh from the preceding bar, so the bass D4 is unequivocally implied; choosing to audiate F4 on the second eighth note (shown on the lower staff) is a satisfying option because it arpeggiates through $\hat{3}$ to the dominant while also quickening the harmonic rhythm. Beat 1 of m. 61 is, of course, pre-dominant in function, connecting from the culminating i^6 of 5–6 motion (spanning mm. 59–60) to the sounding $\hat{5}$ in the bass



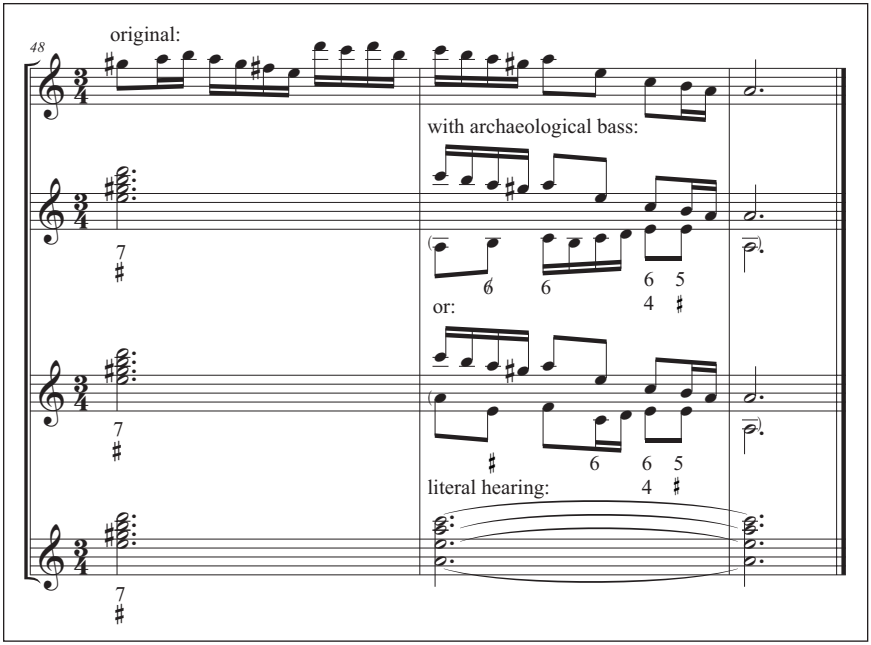
Examples 8A and 8B. Partially accompanied cadences: Partita in A Minor for Solo Flute, Bourrée Anglaise, mm. 31–34 and 59–62, with mixed archaeological and literal hearings

on beat 2. Again, eighth notes F and D initiate an appropriate acceleration in harmonic rhythm. These choices shine light on the agency of the solo-polyphonic listener in actively co-creating a complete contrapuntal texture along with the sounding fragment.

Which opportunities can a keen awareness of these listening strategies open up? The most interesting cadences are the ones that could be heard either literally (i.e., as complete textures unto themselves), or archaeologically (i.e., as upper-voice artifacts above an unsounding bass), with different consequences for each listening strategy. Considering the last three measures of the Sarabande (Example 9), one option is to take the last two measures at face value, hearing them as simply a downward arpeggiation of tonic (lowest staff). This places the cadential arrival on the downbeat of the penultimate measure, just as the clear V^7 chord resolves; the final tonic is slowly unveiled through a downward arpeggiation. Though possible, this hearing is impoverished because it leaves the piece melodically open, ending on a $\hat{4}$-$\hat{3}$ descent (D6–C6) as part of an imperfect authentic cadence. A more compelling hearing requires a more proactive approach in which one audiates an entirely absent bass underneath the penultimate measure; two ways (but not the only two ways) of doing this appear on the middle two staves. While more effortful, these listening strategies have the benefit of securing the more emphatic melodic closure of $\hat{1}$ in sync with, as opposed to a measure later than, the harmonic arrival on tonic. They also accelerate, rather than slow, the harmonic rhythm and permit a typical cadential progression.[33]

The ending of the Corrente is richer yet. Within the last three measures (Example 10, upper staff), there are three potential cadences: on the downbeat of the penultimate measure, on the downbeat of the final measure, and on the very last note. The downbeat of m. 61 is an unambiguous, accompanied IAC as shown in the reduction on the second staff; both the upper-voice D5-C5

[33] It may seem strange to ask students to hear such florid basses, replete with rhythmic character and diminutions such as neighbors and passing tones. One may think, and a few students have even commented, that if we tread into the unsure territory of hearing what does not sound, it is more reasonable to hear simpler, unadorned basses. However, I contend that the more believable an archaeologically heard part is, as in Example 9 (i.e., rhythmically complementary and motivically coherent with the sounding upper voice), the more plausible the whole enterprise of archaeological hearing is.

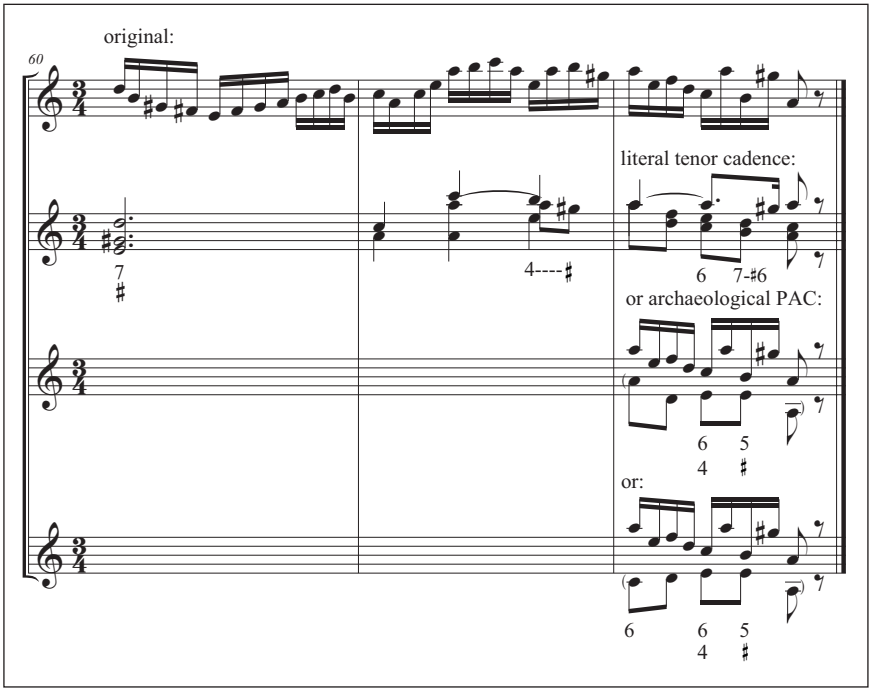


Example 9. Elective hearings: Partita in A minor for solo flute, Sarabande, mm. 48–50, heard either literally (lowest staff) or archaeologically (middle staves)

and the bass E4-A4 sound explicitly. Next, unlike at the end of the Sarabande (Example 9), there is also a relatively straightforward PAC on the downbeat of m. 62. The bass E5 on beat 3 punctuates the cadential dominant, over which a 4–3 suspension further imbues it with cadential status. I find it plausible, then, to hear all three voices—E, G♯, and B—converging on the tripled A5 on the downbeat of m. 62 to close the movement with a PAC.

Yet, what follows that is potentially more complex than just a spilling over of tonic for three beats. Approached via a literal listening strategy, shown on the second staff, the last measure forms a tenor cadence, too weak to constitute a final cadence but strong enough to add further punctuation to the two cadences that have taken place already. However, a penchant for hearing cadences archaeologically might instigate a hearing that I find slightly more effortful and much richer, which involves treating the last measure as an unaccompanied PAC rather than an accompanied tenor cadence. Instead of hearing three voices sharing the A5 on the downbeat, imagine that we evade this potential PAC by audiating the bass line shown on the lowest staff, which allows i^6 to initiate a long cadence that is more emphatic than the other would have

been, this time replete with predominant and cadential $\frac{6}{4}$. The biggest challenge to this hearing, of course, is to hear a bass C4 on the downbeat in the absence of any cues other than those pointing toward PAC; but the prevalence of unaccompanied cadences in solo Bach makes this at least plausible, and it is rewarding, at least retrospectively, for it postpones the final cadence not once, but now twice. Neither the IAC at m. 61, nor now the archaeologically evaded PAC at m. 62, closes the movement, but rather the very last sounding pitch. The second-lowest staff also shows a compromise hearing that is archaeological, but more conservatively so, hearing A4 rather than C4 as the first bass note of the measure.



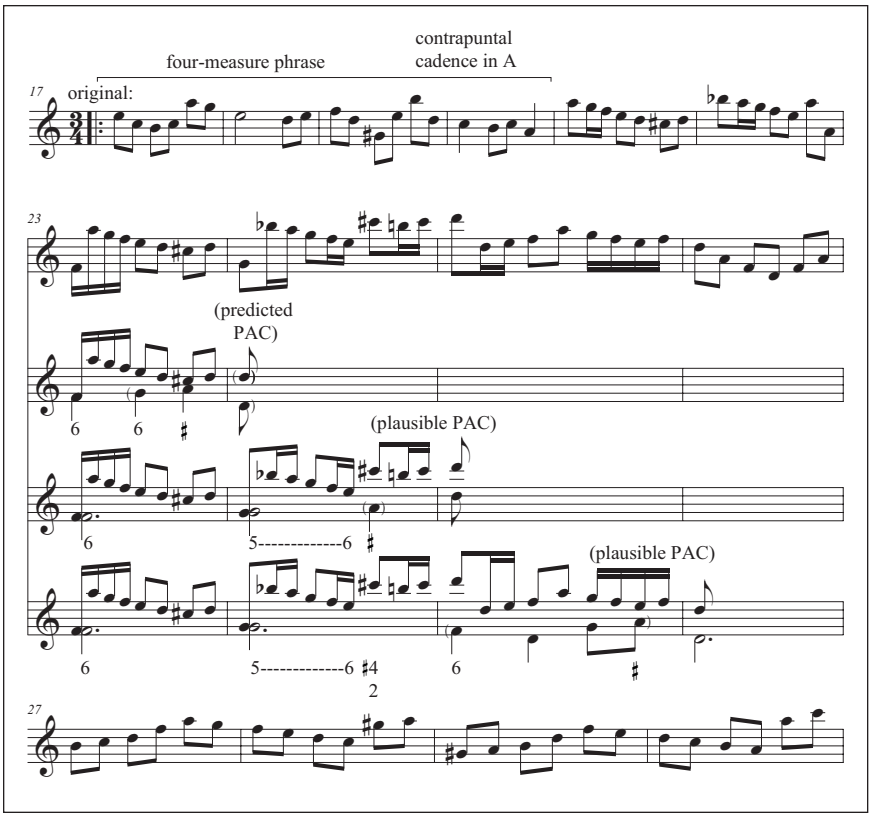
Example 10. Three elective hearings of Partita in A Minor for Solo Flute, Corrente, mm. 60–62: one literal (second staff) and two archaeological (lowest staves)

Listening, singing, playing, and talking their way through these increasingly flexible passages in class, counterpoint students discover that the art of interpreting solo polyphony reaches far beyond collecting the given pitches and realigning them. A deliberate adoption of these listening strategies lends versatility to one's approach, offering the choice to draw aural inferences from what sounds and co-perform with it. The effect of this choice on

performance decisions (e.g., fluctuations in tempo and dynamics, articulation, and breathing) can be dramatic, a conversation that I initiate in class as often as possible and ask students to consider in small- and large-group discussions and through in-class performances. Beyond this, elective listening strategies can affect even phrase rhythm. The second reprise of the Sarabande opens with a four-measure phrase punctuated by a weak contrapuntal cadence to A minor (Example 11, upper staff). The schematic expectation, after David Huron, of another four-measure phrase following it (with a cadence on the downbeat of m. 24) might motivate us to hear m. 23 archaeologically, as part of an unaccompanied cadence to D minor; see the second staff.[34] The last sounding bass note is F4, supporting i^6 on the downbeat, after which we might audiate a bass G4 on beat 2 (supporting ii^{o6}) and an A4 on beat 3 (supporting V); the D5 at the very end of the bar would be an anticipation of the coming arrival.

However, the sounding G4 on the downbeat of m. 24 cancels the possibility of a cadence, and of a four-measure unit, and invites a retrospective rehearing of m. 23 through a literal lens, as shown on the third staff: that is, i^6 for the entire measure over the bass F4 that actually sounds. The G4 on the downbeat of m. 24 supports a predominant harmony—iv at first, and then ii^{o6} via 5-6 motion on beat 2. The huge registral distance between the bass G4 and the rest of the measure leaves no other bass pitch to follow the G, similarly to what happened a measure earlier. One still asks at this point, "Where is the cadence to D minor?" Anticipating a cadence on the downbeat of m. 25, we might audiate an archaeological bass note, A4, on beat 3 of m. 24 (third staff), hearing an unaccompanied cadence on the downbeat of m. 25. This hearing is supported by the upper-voice arrival on the downbeat, and by the D5 on the second eighth note of the measure, which conceivably could resolve the unsounding bass A4 that one has supplied archaeologically. But there is a different possibility, this one of a cadence yet one more measure later; see the lowest staff. Imagine hearing m. 24 more literally, not as part of an unaccompanied cadence, but instead with the bass G4 lasting throughout the measure; the upper-voice motion would generate V^4_2 on beat 3, obligating a resolution to i6 and requiring an audiated bass F4 on the downbeat of

[34] David Huron, *Sweet Anticipation: Music and the Psychology of Expectation* (Cambridge: MIT Press, 2006), 225.



Example 11. Partita in A Minor for Solo Flute, Sarabande, mm. 17–30, with three potential, archaeological PACs in D minor

m. 25. Continuing this bass as shown on the lowest staff would permit the remainder of m. 25 to complete an unaccompanied PAC, arriving on tonic finally on the downbeat of m. 26.

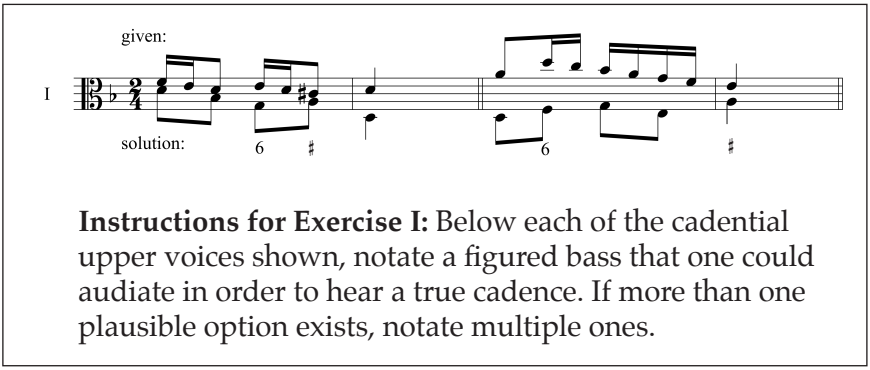
The context does little to arbitrate between m. 25 and m. 26 as potential cadential arrivals; these would create nine- and ten-measure units, respectively, since the start of the second reprise, and, although the rhythmic shift in m. 26 may suggest the beginning of a new phrase, the two-measure sequential model that begins in m. 27 suggests equally strongly that m. 26 is an ending instead. Interestingly here, the approach that one takes to hearing (and perhaps rehearing) solo polyphony affects not only the perception of building blocks such as harmony and counterpoint, but in fact the location of cadences and the determination of phrase boundaries as a result. As an in-class exercise in active listening, I invite students to hear in a maximally archaeological way, expecting an

unaccompanied cadence at m. 24, then revising to expect one at m. 25, and then finally hearing one realized at m. 26. We experiment with performance decisions that may bias one's hearing in one way or another, as well as ones that leave the ambiguity open. For example, we consider whether a flutist might take time in the last two eighth notes of m. 23, portending a cadence and thereby baiting the hook for a surprise on the downbeat of m. 24; and, depending on that decision, whether taking slight time into either or both of the next downbeats would be excessive or compelling. On the other hand, we also consider whether a dynamic increase from m. 24 to m. 25, and a quieting in m. 25 to m. 26, both of which seem to be indicated by the melodic contour, would strip the passage of its potential ambiguity, or whether this would depend on other factors such as rubato and articulation. These discussions often reveal that there is often little agreement even as to which interpretation a set of performance decisions would project, let alone about which interpretation *ought* to be projected, if any; but exploration, not consensus, is the point.

The preceding analytical work, done through in-class discussion and workshop, is complemented by compositional tasks that require students to apply their aural-analytical skills creatively.[35] The short assignments in this section are for viola. Exercise I gives students the upper voices of several unaccompanied cadences and asks them to write cadential bass lines that one could audiate archaeologically; Exercise J does the opposite, instructing them to compose the sounding upper voice that might lead one to imagine the unsounding, archaeological basses that are given. (Just two of each type are shown.) These assignments follow class discussions of passages such as those in Example 7. Since each prompt supports multiple solutions, I encourage students to provide more than one realization of each, and to share their solutions with each other. Exercise K is slightly more advanced, building upon the analytical

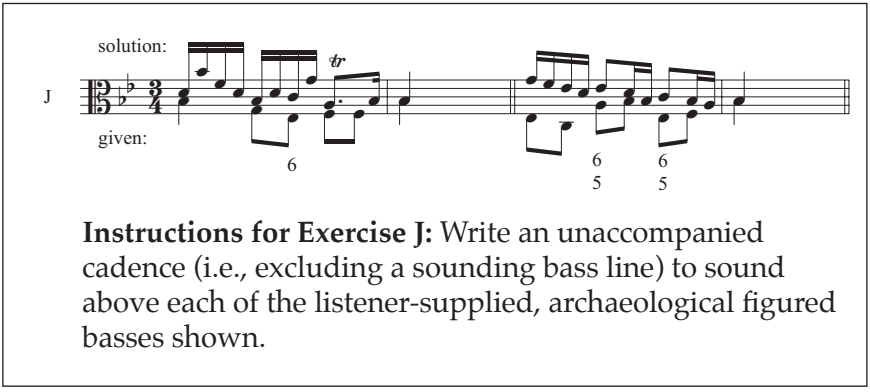
[35] This article presents only written homework, limited to a select few representative examples in order to demonstrate the approach. However, about half of the compositional homework that students complete for the counterpoint course is submitted through music making rather than on paper; they play their creations and submit recordings rather than written documents. Portions of this curriculum (though not specifically on solo polyphony) are demonstrated in Michael Callahan, "Teaching and Learning Undergraduate Music Theory at the Keyboard: Challenges, Solutions, and Impacts," *Music Theory Online* 21, no. 3 (September 2015), http://www.mtosmt.org/issues/mto.15.21.3/mto.15.21.3.callahan.html.

work on partially accompanied cadences (Example 8): students receive a cadential bass line and compose an upper voice that demands an archaeological listening strategy at first, followed by a literal one at the dominant-to-tonic motion. As in the repertoire examples discussed earlier, this involves an abrupt change of register getting into the bass $\hat{5}$, and likely an abandonment of the upper register that requires *it* to be heard archaeologically over the sounding cadential bass.



Instructions for Exercise I: Below each of the cadential upper voices shown, notate a figured bass that one could audiate in order to hear a true cadence. If more than one plausible option exists, notate multiple ones.

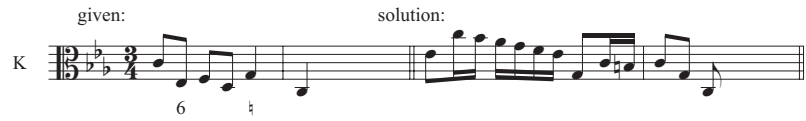
Exercise I



Instructions for Exercise J: Write an unaccompanied cadence (i.e., excluding a sounding bass line) to sound above each of the listener-supplied, archaeological figured basses shown.

Exercise J

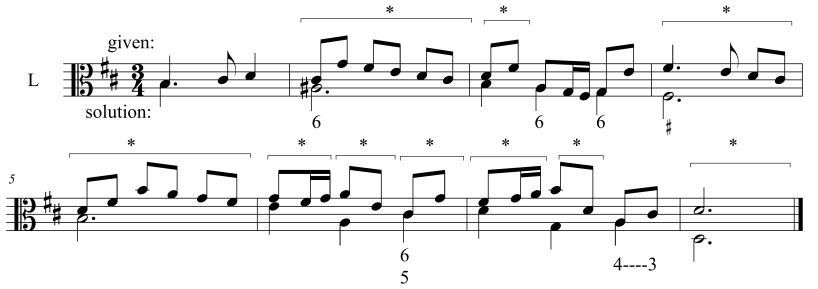
Moving away from just cadences, Exercise L is an aural-analytical exercise in the guise of a compositional task; it instructs students to "compose" an audiated bass line underneath a longer passage that includes some bass notes and omits others. Considering the surrounding context of bass notes that *do* appear, they fill in the gaps at each asterisk, guided rhythmically by the brackets. There



Instructions for Exercise K: Write a partially accompanied cadence that supports the given figured bass. The only sounding bass notes should be at the end: the dominant and, optionally, the tonic in the lower register sometime after $\hat{1}$ appears in the upper voice.

Exercise K

are often multiple possibilities, so I ask them to show a few different ones. The passage ends with a partially accompanied cadence, building upon Exercise K. Exercise M does the opposite, in a sense, by providing scaffolding for students to compose a longer passage

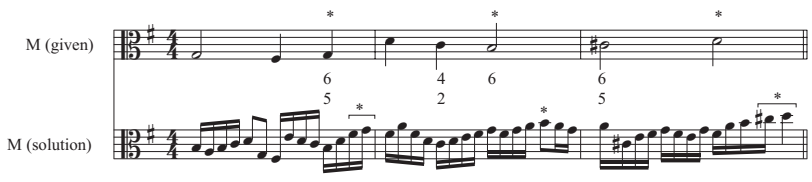


Instructions for Exercise L: In the following passage, several bass notes are implied without actually sounding. At each asterisk, notate a figured bass pitch that you find convincing to audiate underneath what sounds. If you can imagine more than one possibility, show the alternatives. Where there is no bracket, stem and figure the sounding bass note.

Exercise L

that requires both literal and archaeological listening strategies in alternation. An entire bass line is provided, but with instructions that certain bass notes should not sound; since these omitted bass notes are resolutions of preceding tendency tones (i.e., leading tones or sevenths), students transfer the resolution to a different register. Thus, they compose knowing that the missing notes are clearly implied and archaeologically heard, but also use the techniques

discussed earlier to compensate. (Exercise M is similar to Exercise F, discussed earlier, but provides substantially less scaffolding by offering just a figured bass rather than a full contrapuntal framework.)



Instructions for Exercise M: Realize the provided figured bass solo-polyphonically. Bass notes with an asterisk should not actually sound. In those places, omit the bass. Since each of these omissions frustrates a tendency tone, compensate by transferring the resolution to an upper register at some point during the same harmony. Draw an asterisk above each of these compensations.

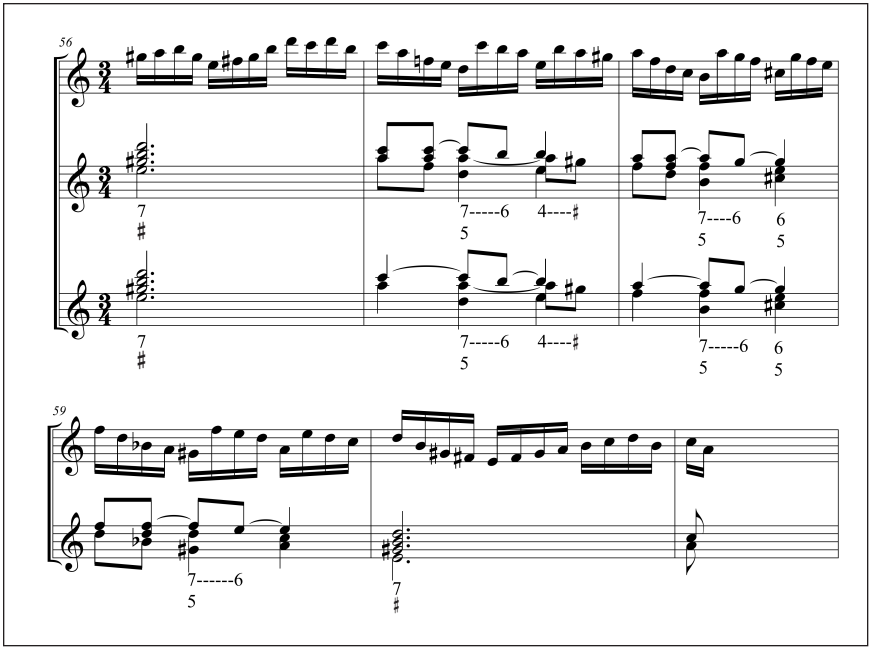
Exercise M

Synchronous Asynchrony and Asynchronous Asynchrony

While the previous discussion dealt with ambiguities concerning how much of a contrapuntal texture is present, this section explores a type of ambiguity caused by the inevitably asynchronous nature of a solo-polyphonic line. It stems from the two different ways in which asynchronous pitches in solo polyphony can be interpreted, either as separate contrapuntal events or as conceptually simultaneous ones that are forced apart rhythmically by the constraints of a single line. One of my favorite passages to discuss in class occurs near the end of the Corrente, in mm. 57–60 (shown in Example 12). In it, a clear upper voice descends an entire octave from D6 to D5 and then resolves to C5 over tonic harmony. The intrigue of this quasi-sequential passage is that the apparent parallelism between surface figurations actually conceals important *differences* among the contrapuntal opportunities that each measure presents to a solo-polyphonic listener.

Beginning with the clear dominant-seventh chord that occupies all of m. 56, which harmonic progression might we hear in m. 57? As in the last section, we might situate listening preferences on a continuum, this time from harmonically eager to harmonically reluctant, with the former preferring more harmonies and hearing each change at the first plausible moment, and the latter preferring fewer harmonies and waiting to group together as many sounding pitches as possible into a single chord. Two interpretations of m. 57 are shown on the lower staves in Example 12, both of which preserve the $ii^{\text{ø}6}_{5}$ with 7–6 suspension on beat 2, as well as the root-position dominant with 4–3 suspension on beat 3. The C6 and A5 that begin the measure unambiguously belong to the same contrapuntal event, with the C as a resolution of the chordal seventh and the A as a resolution of the leading tone. It is the third note, the F5, that might be heard in two different ways: as an inner voice of the upcoming $ii^{\text{ø}6}_{5}$, anticipating the change of harmony as is common in solo polyphony (lower staff); or as a bass note unto itself in a downward arpeggiation from tonic, through VI, to predominant on beat 2. (A third, and more radical, possibility not shown in Example 12 is to hear the F5 as the *first* bass note of the measure, a deceptive resolution of the dominant-seventh chord that makes the preceding A an inner voice rather than a bass note.[36]) While subtle, the differences between these hearings are significant both to the rate of harmonic change and to the identities of the harmonies themselves. The same two hearing opportunities are present a measure later when the surface figuration is sequenced down by third. If the dominant at the end of m. 57 resolves to tonic, then the first A5 of the measure is where three voices—the bass E5, alto G♯5, and upper-voice B5—all converge (not shown). A deceptive resolution is also a contender (lowest two staves), especially if the downbeat of the previous bar was *not* heard deceptively, since the first two pitches of each measure would be treated consistently as belonging together in each case. The deceptive hearing in m. 58 is strengthened by the rising stepwise bass motion across the bar line, which continues a measure later (discussed below). After either an authentic or a deceptive resolution, however, there is still a question of how many harmonies follow. Taking each of the first three pitches in

[36] For this last hearing to be plausible, one must hear the B5 and C6 surrounding the bar line as participants in two different voices: the B leads downward to A, the second note of m. 57, and the C is a resolution of the preceding D.



Example 12. Alternate readings of Partita in A Minor for Solo Flute, Corrente, mm. 56–61

m. 58 as bass notes yields an implausibly quick harmonic rhythm of sixteenth notes; the two reasonable possibilities shown are the ones that continue the same harmonic rhythm as the two potential hearings of m. 57.

As students gain sophistication and become open-minded about the existence of multiple possibilities, it is important for them to evaluate the relative merits of the various options. One arbitrating factor is harmonic rhythm: we may choose to hear a consistent pace of harmonic change between m. 57 and m. 58, which suggests some pairs of hearings over others. Measure 59 also may clarify because it is different yet; the bass on the downbeat is unequivocally D because it resolves the C♯ of the previous beat, which cannot resolve to the B♭ on the second half of beat 1. Moreover, unlike in the two previous measures, the B♭ cannot anticipate the harmony of beat 2 because it does not belong to a leading-tone seventh chord in A minor; that is, since the G♯4 is needed in order to keep the music in A minor, the preceding B♭4 is forced to be a separate harmony, the Neapolitan, rather than part of the beat-2 harmony as on the lowest staff in mm. 57–58. Thus, there *must* be harmonic change on each of the first three

eighth notes of m. 59. Might this unequivocal measure motivate a rehearing of the two pliable measures to achieve a consistency of harmonic rhythm throughout (i.e., the second staff from the top)? Even so, the first beat of m. 60 would not comply, since each of the first three pitches belongs to a measure-long dominant-seventh chord, the bass of which appears on beat 2.

The passage deserves close attention because four measures begin with the same generic melodic intervals, sequenced down a third each time. Yet, since the sequence is harmonically inexact—that is, it does not tonicize A, then F, then D, but rather A twice in a row, then D, and so on—the superficial similarity of surface figuration masks a variety of opportunities for contrapuntal hearing. In class, a student volunteers to perform the passage in different ways, taking suggestions from colleagues about how to privilege one hearing over others; the class auditions the various possibilities. For example, a slight pause (or, on flute, even a breath) after the first pitch of m. 58, which some students suggest at first by instinct, might rule out the hearing that understands F5 as the first bass note of the measure, denying the deceptive resolution by grouping F instead with what follows. If students decide *not* to create space after the first A5 of m. 58, articulation also plays an important role: assuming that the B4 and C♯5 on beats 2 and 3 are distinguished from the three notes later in each beat, perhaps by means of a slight tenuto on each beat and a three-note slur after each beat, the decision of how to articulate the four notes in beat 1 is trickier. One option is to slur the first four notes, making the B4 on beat 2 the first pitch that is articulated uniquely as a bass note; another option is to slur the initial A5 and F5 together, but then to mark each of D5-C5-B4 with stronger and distinct articulation, grouping these three pitches as constituents of a distinct bass voice. The former would seem to privilege the hearing on the lower staff, the latter the hearing on the middle staff. More generally, we argue about whether the (at least superficial) sequential similarity among m. 57, m. 58, m. 59, and the beginning of m. 60 obligates similar decisions in each measure with regard to timing and articulation. And these are just a few of many performance options, none of which points unequivocally to any one reading. Passages like this make for rich teaching moments because they justify careful decision-making that either leaves open options or weighs in on them.[37]

[37] Although I mentioned at the outset, in alignment with Karpinski, "Another Listen," that solo-polyphonic ambiguities are multi-stable rather

Combining the two types of ambiguities discussed so far, students and I also explore passages in which asynchrony presents opportunities to be surprised when one's choice to audiate a bass archaeologically ends up conflicting with an actual sounding bass that arrives late. Only when one is limber enough to hear both literally and archaeologically does this experimental, even playful listening strategy emerge, which enriches even those passages that—at least once they sound fully— are not ambiguous on their own. In m. 6 of the Sarabande, for example, what might we hear as the bass voice (Example 13)?[38] The registral context of the downbeat F5 positions it clearly as an upper voice, leading from the E of the previous measure. Moreover, the F-E-D of the entire measure recalls the same pitches heard twice as quickly across mm. 3–4. This similarity, perhaps bolstered by the immediately preceding G♯4 (albeit as a neighbor to tonic A4), may create a dynamic expectation, after Huron, of a G♯4 in the bass in m. 6, which we would supply archaeologically with the expectation that, at m. 7, the D5 will resolve downward to C5 supported by tonic harmony.[39]

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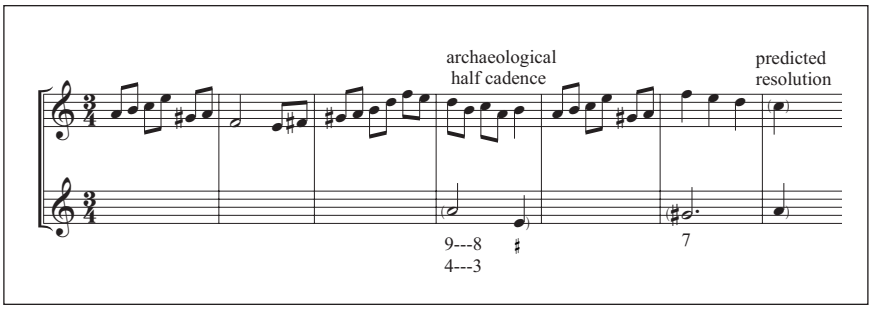
than vague, supporting clearly defined contrapuntal hearings rather than occupying a blurry middle territory, I find that certain performance decisions make it possible to experience something *like* contrapuntal vagueness on the first beats of m. 57 and m. 58. At a fast enough tempo, and with sufficiently undifferentiated articulation, the absolute clarity of the metrically and registrally accented bass notes on beats 2 and 3 of these measures can give way to moments (on beat 1) in which I am certain *only* that the preceding tendency tones—leading tone and seventh—have been resolved; the music can pass quickly enough to preclude any of the specific hearings in Example 12 from crystallizing at the expense of others.

[38] The score excerpts and analytical notations are presented all at once in this section in order to reduce redundancy, but there is value in revealing them bit by bit (aurally and/or in score) during an in-class discussion. The section that follows describes a process of asking students to audiate pitches that conflict with what eventually sounds—which is hindered by seeing visual cues in the score that contradict the hypothetical hearing. Therefore, I use PowerPoint in order to control exactly how much of the score, and exactly which archaeological annotations, appear at any given time, so that students (or at least those who do not know the piece) can experience the rewarding surprise when they eventually do hear (and see) what comes next.

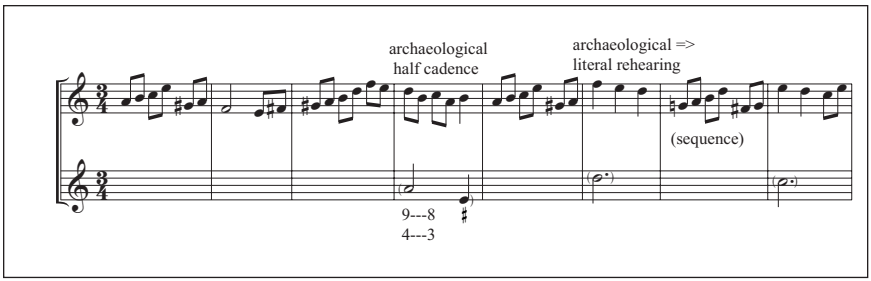
[39] Huron, *Sweet Anticipation*, 229.



Example 13. Partita in A Minor for Solo Flute, Sarabande, mm. 1–6 with archaeological hearing shown

If we make this choice, then the actual G♮ of m. 7 (Example 14) arrives abruptly, contradicting the audiated leading tone and shifting toward the relative major by continuing a descending-fifths sequence that we retrospectively understand to have begun on the downbeat of m. 5; this leads us to revise our hearing of m. 6 in favor of the literal option, with the D5 on beat 3 as a late, but actually sounding bass, rather than as an upper voice over an imagined bass. While this is eventually clear, to identify D5 as the unequivocal bass of m. 5 would overlook the opportunity offered by its tardiness in the measure, namely to experience the measure archaeologically—as is supported by the preceding context—until this is refuted by the first note of m. 7. I find that, even though the music is now entirely familiar to me, I still gravitate toward hearing an archaeological G♯4 underneath the F5 at the *start* of m. 6, but then, over the course of the measure, I revise it to a literal bass of D5 in order to prevent a clash with the G♮ that I *know* is upcoming. In that sense, my hearing begins as archaeological and *becomes*, after Janet Schmalfeldt, literal at some undetermined point in the measure.[40] (Given the sequential pattern, there is no ambiguity in m. 8 as there was in m. 6; we predict C as the bass.) Students and I listen to the recording of the first eight measures in class, and I invite them to choose to experience this archaeologically instigated surprise, as I enjoy doing. The in-class lesson is that a more effortful, more interactive hearing such as this one may result in more rewarding aural experience. Moreover, in connection with performance, a flutist who chooses to linger just slightly on beat 3 of m. 6 (but then avoids doing the same two measures later once the context is obvious) dramatizes the possibility.

[40] Janet Schmalfeldt, *In the Process of Becoming: Analytical and Philosophical Perspectives on Form in Early Nineteenth-Century Music* (Oxford: Oxford University Press, 2011).



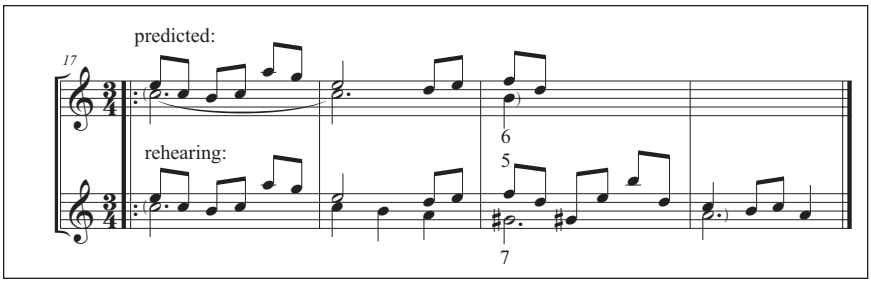
Example 14. Partita in A Minor for Solo Flute, Sarabande, mm. 1–8, with revised literal hearing of m. 6

The opportunities presented by the modulation to the mediant in mm. 5–8 reappear in reverse at the start of the second reprise, which follows a strong cadence in C major at m. 16 (Example 15, upper staff). Hearing tonic in the local C major at m. 17, there is no compelling reason to replace the bass C5 under the sustained E5 of m. 18; the C, which is easily retained on account of being left by leap, can last until the downbeat of m. 19, where the F and D invite a hearing of dominant in C major, with a bass of either B4 or G♮4. The point is that the downbeat F5 of m. 19 is a tendency-laden chordal seventh with, after Steve Larson, both gravity and magnetism acting upon it to fall to E.[41] If one chooses to hear the first beat of m. 19 as dominant in C, though, the appearance of G♯4 rather than G♮4 on beat 2 comes abruptly, preserving the downward tendency of F but converting it into a diminished seventh in A minor. Might a different approach to mm. 17–19 render the G♯ less abrupt? Imagine audiating an entirely archaeological pivot in m. 18, such as the one on the lower staff, which prepares the return of the tonic key more smoothly without any additional help from the solo-polyphonic surface.[42]

The process then comes full circle during the return in this rounded binary form, which begins at m. 35 (Example 16). The similarity of m. 40 to m. 6 (shown in Example 13) may lead one to expect a G4 as the bass note of m. 41, as part of another descending-seconds sequence that matches the earlier one. To audiate G♮ as

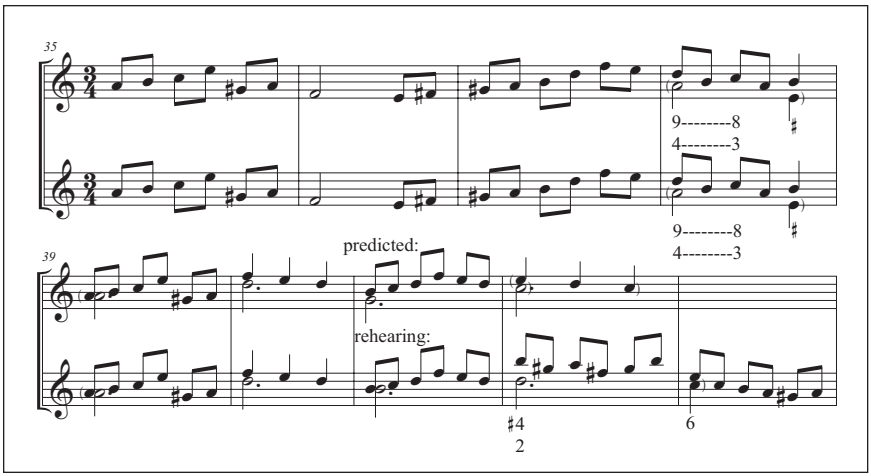
[41] Steve Larson, *Musical Forces: Motion, Metaphor, and Meaning in Music* (Bloomington: Indiana University Press, 2012), 2.

[42] During in-class activities that involve this kind of audiation (including ones discussed earlier), we first listen to the recording or an in-class performance of the excerpt while singing the archaeological bass *out loud*. Once primed, we listen again while performing the previously sung voice entirely silently (i.e., through audiation).



Example 15. Partita in A Minor for Solo Flute, Sarabande, mm. 17–20, with G♯ heard as abrupt (upper staff) or as prepared by an archaeological pivot (lower staff)

the bass is to expect C major in m. 42, and to be surprised by the G♯ and the dominant function of that measure, which remains in A minor and is followed by a transposed repeat of mm. 10–14 in tonic for the end. The result is a mandatory retrospective rehearing of m. 41 at face value, literally rather than archaeologically, as containing rather than lacking its bass: a predominant ii harmony with B4 as bass note, followed by a dominant $\frac{4}{2}$ over the D that is anticipated at the end of m. 41. Of course, given the conventions of rounded continuous binary form, one may have had the schematic expectation of a G♮ in m. 7 as well as a G♯ in m. 42; that is, we normatively encounter a modulation to the relative major during the first reprise, and the absence of a modulation near the end of the second reprise. Nonetheless, the permission that solo polyphony gives us to co-perform with it makes this important moment in the form—where the return begins to deviate from an exact repetition of first reprise in order to remain in tonic—particularly engaging.



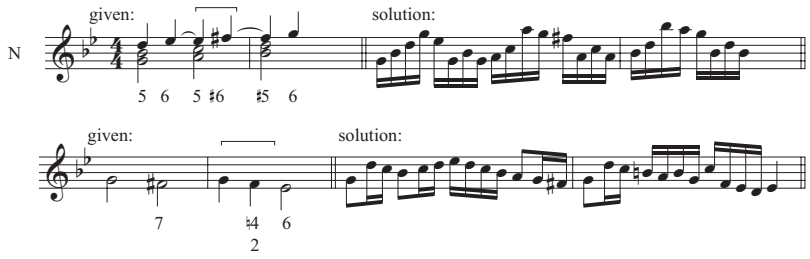
Example 16. Partita in A Minor for Solo Flute, Sarabande, mm. 35–43, with hearing of descending-fifths sequence as in mm. 5–8 (upper staff) and compulsory revision to stay in tonic (lower staff)

Exercises N–P, for flute, are designed to help students capitalize on the opportunities presented by asynchrony; not all of them deal with ambiguity. In Exercise N, students begin with either a figured bass or a fully realized framework, which includes a contrapuntal feature that would benefit from some smoothing out (bracketed): either an upper-voice augmented second (E♭–F♯, upper staff) or an instance of direct chromaticism (B♭–B♮, lower staff). In the latter, by implying rather than actually stating the B♭4 that belongs to tonic harmony (shown in the sample solution), one ensures that the introduction of B♮ alters an audiated pitch rather than an actually sounding one. In the first system, the model solution leaves the E♭5 by leap and then approaches the F♯5 from above (m. 1) via a surplus consonance in the upper register. In each case, the task is to create a solo-polyphonic realization that uses asynchrony and stepwise motion to space out these melodic motions, thereby preserving the given progression while rendering it more smoothly in solo polyphony than would be possible in explicit polyphony. We study model passages of this type from the literature, in order to prime students for this mode of creative thinking.

Exercise O takes advantage of asynchrony in a different way, locating common tones between adjacent harmonies and placing them *before* the understood moment of harmonic change, thereby allowing the progression to unfold gradually rather than all at once. This is a ubiquitous procedure in solo polyphony—indeed, one of the factors that can make even simple harmonic analysis challenging to students. Given a sequential figured bass, students locate the two common tones (F♯6 and D6 in the first measure) and, needing to prepare all of the suspended sevenths properly within the preceding harmony anyway, craft a solo-polyphonic melody that does double duty: the F♯ and D at the end of beat 1 participate in the initial tonic harmony and, by leaving the F♯6 by leap, establish its persistence as an implied seventh; and the same two pitches also initiate a downward arpeggiation of the harmony on the second beat of the measure, thereby unveiling it gradually rather than all at once beginning on beat 2. With only one sounding pitch available at a time, such a process is bound to happen quite commonly, since only one voice can be present at the understood moment of harmonic change; still, focusing on this procedure as a distinct feature of solo polyphony equips students, I find, to write pieces that do not always "start from scratch," as I say, within each harmony.

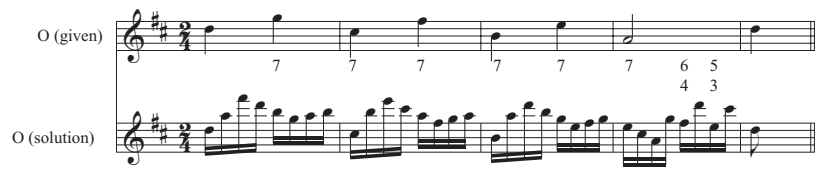
Finally, Exercise P deals with the kind of ambiguity discussed earlier in this section, in which asynchrony allows an audiated (i.e., archaeological) bass to conflict with one or more pitches that do sound, but arrive late. The task is modeled quite closely after the opening of the Sarabande, discussed with reference to Examples 13 and 14: the challenge is to compose m. 6 in such a way that *either* D♯ *or* A could be heard plausibly as the bass, so that a listener might audiate the former and be required to rehear the latter after encountering the sequential introduction of the relative major.[43]

[43] Since none of the compositional etudes have single right or wrong answers, and several of them are explicitly focused on ambiguity, students perform their compositions in class and ask whether others do (or can) hear them as intended.



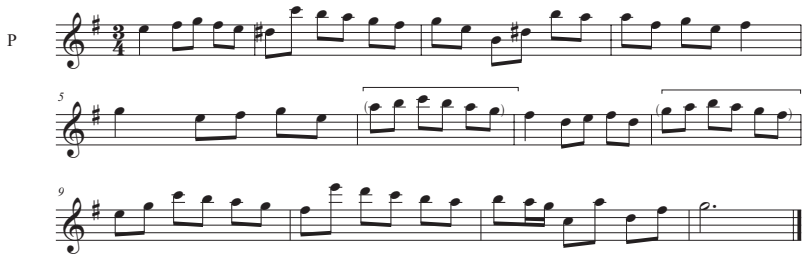
Instructions for Exercise N: Realize the given contrapuntal progressions solo-polyphonically. Each contains an instance of either direct chromaticism or an undesirable melodic interval, marked with brackets. Take advantage of the asynchrony to smooth these out.

Exercise N



Instructions for Exercise O: Realize the given figured bass solo-polyphonically. Search for places where one or more pitches are shared between consecutive harmonies, and take advantage of this by placing these pitches at the seam and dovetailing the moment of harmonic change.

Exercise O



Instructions for Exercise P: Compose the missing portions of the passage above to create a descending-seconds (i.e., circle-of-fifths) sequence beginning in m. 5. However, do so in a way that would permit a listener to audiate a bass D♯ (and vii^{o7}) in m. 6, as in m. 2, and therefore to experience the ensuing sequence and modulation to III as a surprise.

Exercise P

Conclusion

As the capstone project of our unit on solo polyphony, students compose short pieces (e.g., suite movements in binary form) and perform them in class. These are meant to synthesize the techniques that they acquire with the unique performance considerations of their own instruments—ranging from viola to tuba to marimba. For several years prior to introducing the activities described above, the end products were mediocre, and for two reasons, I think. First, we had spent the unit learning techniques of compound melody (e.g., arpeggiation, implied suspensions) without delving into ones specific to solo polyphony; by neglecting passages with the depth and ambiguity of those discussed above, I had equipped students only to write straightforward pieces. The second reason was the nature of the guidance that I had given them for writing the pieces, which was in the form of a figured bass that I (or, in some years, the students and I together) had written—something like the counterpoint given for Exercises A–F, but longer and without the upper voices. Wanting to leave room, rhythmically, for implying multiple voices, I set students up for failure by chaining them to a slow-moving and blandly undifferentiated harmonic rhythm,

uncharacteristic of Baroque pieces. It is hardly surprising that even the best student pieces were essentially figuration preludes for solo instrument: repetitive and predictable, "chordy" in the sense that figuration seemed to be filling in rather than connecting successive harmonies, and requiring little effort to decipher aurally.

For the capstone composition project, I now provide a different type of guidance that straightjackets students less than a given figured bass does. Students craft a template for a short piece in binary form, specifying the locations and types of cadences, sequences, modulations, and other contrapuntal schemata that they have acquired earlier in the semester. By giving them the freedom to make their own specific decisions (e.g., about harmonic rhythm), the task now requires them to place the techniques that they have acquired through compositional etudes (e.g., Exercises A–P) into a broader context, considering, for example, how waypoints such as phrase openings and final cadences might project greater solo-polyphonic clarity than internal cadences, phrase middles, and sequences (although this certainly need not be true). One benefit of this more open-ended prompt is that it leaves room for the types of understatement and ambiguity that are cornerstones of solo polyphony.[44]

Both the in-class, aural-analytical activities and the written, compositional etudes presented here ask a great deal of students because, in order to do the solo-polyphonic repertoire justice, its pedagogy needs to focus on the distinction between it and basic compound melody, and on the challenges, ambiguities, and creative opportunities that result. Solo polyphony requires a uniquely participatory approach to listening—an individualized and imaginative one. Beyond what it *demands*, though, this music also frequently *permits* a listener the freedom to play an essential creative role. The ideas offered here are intended not as a comprehensive pedagogy of solo-polyphonic hearing, but rather as some suggested conduits through which students might explore some of its subtlety. In teaching solo polyphony, I employ these

[44] I am grateful to an anonymous reviewer for the suggestion to add an analytical component to what is currently a compositionally oriented capstone. Beginning the next time I teach the course, students also will choose a solo-polyphonic piece (or transcription) for their own instrument, isolate a few ambiguous passages, and analyze them to discover possible hearings. I plan to carve out class time for students to perform these passages and talk about their choices.

methods alongside contrapuntal reductions: the latter emphasize the fundamental premise that counterpoint works the same way in the understated poetry of this music as in the more plentiful prose of other music that students have encountered earlier in the semester; and, meanwhile, the former spotlight the complexity and fluidity of solo polyphony, drawing students toward its most challenging (and often rewarding) features. My teaching of this repertoire used to sand off the inevitable quirks of polyphony in a single voice, but my central motivation is now to focus especially on revealing the beauty of these contrapuntal burls—and to help students to engage in nuanced, imaginative, even experimental ways with this music that is hardly solo at all, but rather beautifully co-performed.

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Enhancing Learning in an Advanced Analysis Course: the Flipped Model, Peer Learning, and the Mode Effect

By Brenda Ravenscroft and Victoria Chen

Traditionally, the analysis of music is a solitary activity, completed by individual theorists, performers, or conductors before their interpretations are disseminated through writing, presentation, or performance. A similar model is often used for teaching analysis: students are given the context in which a piece was composed, taught the most appropriate analytical approaches—and then asked to complete their analyses on their own, usually outside of class time as a homework assignment.

However, recent research into cognitive science has found that students learn better in groups than individually, coining the concept "collective general intelligence" to describe a group's ability to perform better on complex tasks such as solving puzzles, making moral judgments, and brainstorming.[1] In education fields, this concept has been applied to "peer learning"—where students learn from other students by participating in communal activities, discussions, and tasks—and this has also been shown to result in more effective learning than traditional solitary methods of learning.[2] These more active and collaborative forms of learning enable better conceptual understanding and long-term knowledge retention because students are placed at the center of their own learning.[3]

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[1] Anita Williams Woolley, Christopher F. Chabris, Alex Pentland, Nada Hashmi, and Thomas W. Malone, "Evidence for a Collective Intelligence Factor in the Performance of Human Groups," *Science* 330, no. 6004 (2010): 686–88, http://www.sebbm.es/archivos_tinymce/woolley2010.pdf.

[2] Peer learning trends in higher education and methods for developing more effective peer learning approaches are discussed in *Peer Learning in Higher Education: Learning From and With Each Other*, ed. David Boud, Ruth Cohen, and Jane Sampson (New York: Routledge, 2014).

[3] Joel Michael gives an overview of how active learning has been adopted across disciplines in science, psychology, and education in

While few similar studies exist in the field of music theory, there is growing interest in adopting active and student-centered learning approaches in fundamental music theory courses. Recent journal articles have examined issues on how to engage students through effective questioning in the classroom, while a rich web-based resource, *Engaging Students: Essays in Music Pedagogy*, established in 2013, offers short, open-access essays focused on a variety of student-centered learning topics.[4] In particular, music theory instructors have started experimenting with the "flipped" classroom model, referring to any approach in which students do preparatory work before coming to class and engaging in activities during class.[5] Studies examining the flipped classroom model have suggested learning is more efficient for students than traditional lectures because students are exposed to the content and theories before class through readings or watching video-recorded lectures, and come to class ready to process the information by participating in problem solving activities, analyzing data or text, and contributing to discussions.[6] These in-class activities allow students to apply the knowledge from their solitary preparation and receive support and immediate feedback from peers and the instructor on their performance.

"Where's the Evidence that Active Learning Works?," *Advances in Physiology Education* 30, no. 4 (2006): 159–67.

[4] Scott Dirkse focuses on pedagogical strategy rather than curricular content in "Effective Questioning Strategies for the Music Theory Classroom," *Journal of Music Theory Pedagogy* 28 (2014): 69–84. The online journal *Engaging Students* developed from the eponymous annual gathering (formerly *FlipCamp*), which the organizers describe as "an unconference on classroom music pedagogy" (see http://flipcamp.org/).

[5] Kris Shaffer and Bryn Hughes present three pedagogical models associated with the flipped classroom in "Flipping the Classroom: Three Methods," *Engaging Students: Essays in Music Pedagogy* (2013), http://flipcamp.org/engagingstudents/shafferintro.html, while Jan Miyake offers insights into using podcasts in "A Mini-Flip of the Music Theory Classroom," *Engaging Students: Essays in Music Pedagogy* (2014), http://flipcamp.org/engagingstudents2/essays/miyake1.html.

[6] Linda C. Hodges describes the three phases of learning and how flipped classroom models maximize students' achievement in these phases compared to traditional lecture teaching in "Making Our Teaching Efficient: Flipping the Classroom," *The National Teaching & Learning Forum* 24, no. 5 (2015): 1–4.

In the case of the flipped music theory classroom, the application of knowledge often takes the form of analytical or model composition activities. For example, Shaffer describes a flipped species counterpoint class in which students complete a short reading about contrapuntal rules and watch a video demonstration by the instructor before coming to class and working on species counterpoint exercises.[7] In a course focused on more complex music, Hughes found that by having students listen to a piece and complete a fundamental analysis outside class, class time could then be used to focus on "close analysis of the most interesting and difficult passages."[8]

The move towards engaging students in the application of theoretical concepts during class time has driven a demand for different teaching spaces, and the reconfiguration of classroom spaces into "active learning classrooms" (ALCs) is a growing trend in higher education across North America.[9] Although there is no single model for an ALC, and technology can play a large role or not be present at all, ALCs share a common design focus on facilitating student interaction and group learning. One popular format combines group work with technology by allowing students to sit in groups at circular tables and work collaboratively on large interactive whiteboards adjacent to each table. Students have the space to work individually or as a group without needing to physically reconfigure the classroom space. The size of these classrooms can vary from 20 to 200 students, but even at the higher end of enrollment, students and instructors have stated that active learning classrooms feel smaller than other classrooms that hold the same number of students because the configuration "creates opportunities for impromptu conversations."[10] Furthermore, in

[7] Kris Shaffer, "The Basic Flip," *Engaging Students: Essays in Music Pedagogy* (2013), http://flipcamp.org/engagingstudents/shafferpt1.html.

[8] Bryn Hughes, "Just-in-Time Teaching and Peer Instruction," *Engaging Students: Essays in Music Pedagogy* (2013), http://flipcamp.org/engagingstudents/hughes.html.

[9] The website SCALE-UP ("Student-Centered Active Learning Environment with Upside-down Pedagogies," 2011) hosts research-based information on learning space design, instructional approaches and learning materials (http://scaleup.ncsu.edu).

[10] Paul Baepler and J. D. Walker describe how learning spaces can change interpersonal relationships in the classroom in "Active Learning

a series of surveys and interviews with students from various undergraduate disciplines using the ALCs, students overwhelmingly agreed that the learning environment was more welcoming and comfortable than lecture halls, allowing them to form better relationships not only with peers but also with the instructor.[11]

The increased interaction successfully facilitated by the configuration of ALCs raises questions about whether the technology is truly needed in an ALC and what difference it may make to students' learning. Could the same information be presented on paper and still lead to the same type of learning? Or does the mode of presentation affect learning? The "mode effect" has been examined most closely in studies on test taking, with results suggesting that identical computerized and paper-and-pencil tests do not produce equivalent test-taker performance.[12] Possible contributing factors to the difference in performance include content familiarity and differing cognitive load demands in the different modes.[13] However, little research has examined how peer learning contributes to the mode effect, and whether differences in learning may occur in different modes.

Present Study

This case study presents an example of the flipped learning model being used in upper-year course, Advanced Analysis of Post-tonal Music, with several unique features.

First, the piece being studied, Elliott Carter's song cycle *What are Years* (settings of five poems by American Modernist poet

Classrooms and Educational Alliances: Changing Relationships to Improve Learning," *New Directions for Teaching and Learning* 2014, no. 137 (2014): 27–40.

[11] Victoria Chen, Annie Riel, and Andy Leger, "Overlooked and Underestimated: The Impact of Physical and Mental Well-Being in Learning in Higher Education Classrooms" (paper presented at the annual meeting of the Canadian Society for the Study of Higher Education Conference, Ottawa, ON, May 30–June 5, 2015).

[12] Heidi V. Leeson, "The Mode Effect: A Literature Review of Human and Technological Issues in Computerized Testing," *International Journal of Testing* 6, no. 1 (2006): 1–24.

[13] Jan Noyes, Kate Garland, and Liz Robbins, "Paper-Based Versus Computer-Based Assessment: Is Workload Another Test Mode Effect?," *British Journal of Educational Technology* 35, no. 1 (2004): 111–113.

Marianne Moore), was composed in 2009, challenging students to grapple with very recent music about which there is little existing analytical literature. Furthermore, Carter's late music demands the use of sophisticated analytical tools: fluency with pitch-class set theory and an understanding of Carter's harmonic system are needed to decode pitch structures, and knowledge of Carter's unique rhythmic language and system of stratified pulse streams is required to successfully analyze his rhythmic organization. In contrast to most courses, where the instructor is already very familiar with the music being taught and has often previously analyzed or consulted published analyses of the pieces, in this case the instructor (the first co-author) deliberately chose a piece with which she was unfamiliar (although the instructor is an expert in Carter's late style and compositional techniques). As a result, the standard instructor-student hierarchy was disrupted, and the process of discovery pervaded the course for both students and instructor.

Second, in addition to flipping the traditional teaching model by making analysis the central classroom activity, the course was structured with a strong focus on peer learning, following a team-based learning (TBL) approach. TBL embodies four "essential elements": (1) groups—groups must be properly formed and managed; (2) accountability—students must be accountable for the quality of both their individual and group work; (3) feedback—students must receive frequent and timely feedback; and (4) assignment design—group assignments must promote both learning and team development.[14] Students in the advanced analysis course were assigned to small groups by the instructor at the start of the term, and completed analytical tasks almost exclusively with their assigned group for its duration, both in and outside of the classroom. (Each student, however, completed an individual interpretation—the final "analysis"—of the data gathered through group work.)

Finally, unlike the flipped model usually adopted in theory courses, classroom technology was integral to analytical activities during class. The ALC selected by the instructor for this course

[14] Larry K. Michaelsen and Michael Sweet discuss the basic tenets of TBL in their introductory chapter, "The Essential Elements of Team-Based Learning," in *Team-Based Learning: Small Group Learning's Next Big Step*, ed. Larry K. Michaelsen, Michael Sweet, and Dean X. Parmelee, New Directions in Teaching and Learning (San Francisco: Jossey-Bass, 2008), 7–27.

conformed to the model described above, with separate round tables, each with its own interactive whiteboard (with internet access), and a central console for the instructor. This configuration enabled the instructor to show short videos and give occasional demonstrations, and, most significantly, allowed each group to project their score onto their own screen and to make annotations on the interactive whiteboard as they analyzed the music during class time. A second mode for score analysis was also available to students in the form of conventional paper photocopies.

This article will present the pedagogical and musical rationales for the course structure, explaining how the flipped model supported the course objectives and student learning goals. An overview of in-class and out-of-class activities will lead to a detailed discussion of the group analytical activities, focusing on the mode effect and team-based learning. The effectiveness of the flipped model to teach the analysis of new music will be supported by analysis of video footage from the class, and by the results of a pre-post study conducted via student questionnaires. To conclude, a critical reflection on the flipped course will be presented in the form of lessons learned.

The Flipped Music Analysis Course

Two of the primary motivations for adopting the flipped model were (1) to enable students to experience the exhilaration of analytical discovery together in the classroom; and (2) to ensure that students could benefit from the advantages of peer instruction and group work, with the goal of having them attain similar levels of mastery over the material regardless of their individual strengths. In comparable advanced analysis courses taught using a traditional approach, where class time was largely spent covering analytical approaches and the students completed their analyses on their own outside the classroom, the excitement of communal discovery was rarely present, and the disparity in student skill levels meant that those with weaker backgrounds and abilities fell behind and were often not able to accumulate the detailed and accurate analytical data necessary for an appropriately sophisticated interpretation of the piece. It was anticipated that these drawbacks of a traditional approach potentially would be exacerbated by the repertoire selected for the course—due to the newness and unfamiliarity of the music, the complexity of Carter's compositional practice, and

the added dimension of text setting. Having students working in groups offered a solution to what might otherwise have been an overwhelming task for some individuals.

The flipped model encourages students to take ownership of their learning by requiring them to complete work independently outside class, often in the form of readings and short activities to consolidate fundamental information, and by engaging them in self-directed activities in the classroom. The emphasis on student autonomy and responsibility engendered by the structure of the flipped course helped the instructor to achieve one of her main objectives for the course, which was for students to acquire the confidence and technical skills to analyze unfamiliar post-tonal music in order to inform their performance, conducting, or teaching activities. Other objectives were also realized through flipping the course: the inquiry-based and discovery learning that characterized this implementation facilitated the students' development of transferable skills such as critical thinking and problem solving, while engaging students in peer instruction and peer evaluation enabled the development of important collaborative skills that could be applied in other contexts.

The class of nineteen senior undergraduate music students met weekly in three-hour sessions over a twelve-week term. While not all were theory majors, the students were either in the Bachelor of Music or the Bachelor of Arts Honors music concentration program, and the course allowed them to fulfill their required upper-year credits in music theory. Students were assigned to three groups of five and one of four, and worked on a single song from Carter's cycle throughout the course. Much of the first class was spent orienting the students to the flipped model (with which few were familiar) and to the rationale for the design of the course, as well as to Carter's late music in general. Because of the importance of group work, students were also encouraged to participate in a facilitated discussion about their responsibilities as team members and desirable attributes for contributing positively to group interactions.

The framework for the course comprised a series of alternating in-class and out-of-class activities, scaffolded so that students were gradually prepared for their culminating activity: to create an individual analytical interpretation of one of the songs—presented in the form of an essay—by drawing on the analytical data gathered throughout the term. Within this structure, the content sequenced

through different aspects of the music before integrating them: analysis of the poems (two weeks), pitch structure (four weeks), rhythmic structure (four weeks), and synthesis of all aspects into a text-music analysis of the song (two weeks). Appendix A presents an overview of the timeline for the course, clearly indicating which activities took place in class and which were completed outside of class. (The timeline was available to students on the course website, housed on the university's learning management system, from the beginning of the term.)[15] Appendix B shows the weekly template used to give students details about their upcoming activities and the intended learning outcomes for that week (the third week).

In general, tasks assigned for completion outside class time were intended to provide students with the appropriate background (such as researching Moore's poetry and analyzing the poems), and to help them develop the required technical skills (such as reviewing set class theory and learning about Carter's unique approach to set class usage). While they were expected to do this work independently, incentives were provided and the value of the work to activities in the next class was always clarified. For instance, after doing a required reading, students had to take a short online comprehension quiz prior to class (worth a few points). Using the quiz data and following a "just-in-time" approach, the instructor would then start the next class by expanding on the topics in which most students had experienced challenges, before directing the students to apply the insights gained from the reading to their ongoing analyses.[16] A few group activities also took place out of

[15] The website was a critical tool in the course. All materials were posted to the website, it housed resources such as scores, e-readings, and links to recordings and videos, and hosted the comprehension quizzes and grades. The website also facilitated communication between the instructor and the students: assignments were submitted and returned via the website, and two days after each weekly class the instructor posted an encouraging reflection on the students' progress. In order to ensure that all students were comfortable with the website's content and structure, the instructor devised a "scavenger hunt" for the first class, in which student groups competed to see which group could navigate their way to locate certain website features first. The exercise also helped familiarize students with the classroom technology by projecting the course website onto each group's interactive whiteboard and requiring them to engage with the interactive whiteboard's tools.

[16] For a description of this method see Hughes, "Just-in-time Teaching and Peer Instruction."

class, usually in the form of preparing class presentations. Student groups gave presentations on Moore's poetry at the beginning of the term, and, after learning about Carter's methods for organizing rhythm, composed and performed a percussion piece in class to demonstrate particular techniques.

Class time was focused on the application of skills, and on consolidating and extending background learning through the analysis of Carter's music. Students worked in their groups almost exclusively in class, analyzing their songs from the perspective currently being studied by annotating the scores projected onto their interactive whiteboards as well as working on paper scores.[17] The instructor roamed through the class to listen, verify information, and prompt students with guiding questions. Consistent with the flipped model, very little class time was devoted to the transmission of information, other than to reinforce concepts or knowledge as needed based on quiz results or in response to a repeated question from multiple student groups.

Student-centered approaches like the flipped model and TBL emphasize the need for frequent assessment, both formative and summative. In this course, students were assessed as groups and individually, and, to signal the value of all of the course activities, the instructor assigned points to every component no matter how small. Students received group grades for the data that they gathered through analysis, and for group presentations. They also engaged in peer evaluation, where each student evaluated the others in their team in terms of their group contributions. Individual assessments included online comprehension quizzes, in-class tests to demonstrate mastery of analytical approaches (graded in class for immediate feedback), formative writing assignments, and the final analytical essay, which was worth 22% of the course grade.

Mode Effect

During two class sessions, spaced about six weeks apart in weeks three and nine, three groups of students were video recorded as they engaged in group analysis of the Carter songs they had

[17] At the end of each class students downloaded their annotated scores onto the website so that they could continue their analyses between classes.

been assigned.[18] Thematic analysis was used to analyze the video recorded sessions noting instances of peer discussions and type of mode used. After the initial analysis, the following codes were generated to further distinguish the type of modes, analyses, and interactions:

- the type of mode used: paper copy or interactive whiteboard electronic copy of the music
- the type of analyses occurring: micro-level (sections of the piece), or macro-level (relations between sections of the piece and piece as a whole)
- the type of interactions: working individually or as a group

A combination of componential analysis and constant comparison analysis was used to uncover relationships between codes and to understand the data set as a whole. Componential analysis uncovers relationships between codes (for example, comparing the uses of the modes, analyses, and interactions), while constant comparison analysis examines relationships between the comparisons discovered through the componential analysis to unveil a greater understanding of the data as a whole (for example, how do the different modes relate to the types of analysis, how do different interactions relate to the types of analysis).[19] The resulting interpretation of the findings is depicted graphically in Figure 1.

[18] In the fourth group one student did not give permission to be videotaped and therefore this group was excluded.

[19] Nancy L. Leech and Anthony J. Onwuegbuzie suggest using at least two types of data analysis tools to improve rigor. Each analytic tool has its own strengths and offers a slightly different vantage point that allows the researcher to extract more meaning from the same data set ("An Array of Qualitative Data Analysis Tools: A Call for Data Analysis Triangulation," *School Psychology Quarterly* 22, no. 4 (2007): 557).

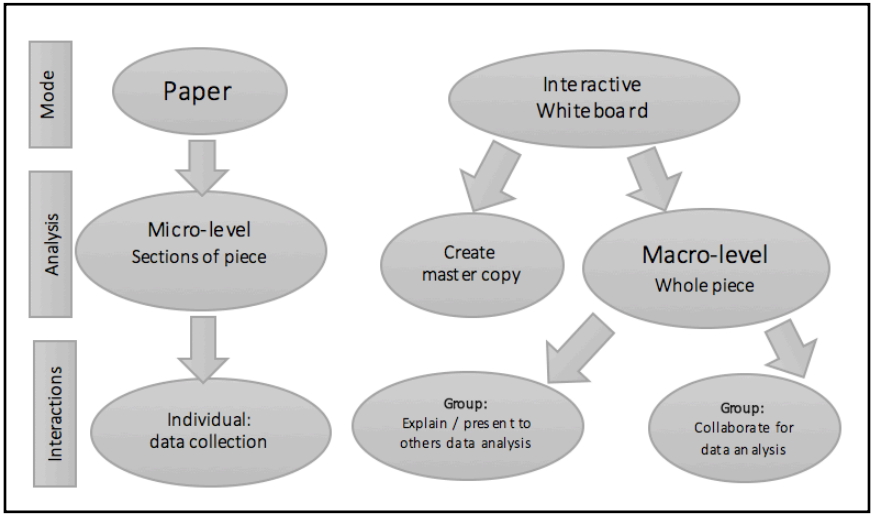


Figure 1. Visual Representation of Mode Effect in the study

All students in the class had paper copies of the scores for their songs. They were told to devise their own way of distributing the work among group members, but the groups gravitated towards the same solution and decided to assign specific sections of their piece to each member to analyze. During the first videotaped session, most students spent the class time individually "micro-analyzing" their sections of the music working from the paper score, as can be seen in the still frames from the video in Figure 2.

Figure 2. Students working on individual sections of music on paper

When students had completed their micro-analyses of their sections, they contemplated the best way to record all of their

individual findings into one copy. It was agreed by all groups that the best strategy was to record their analyses on the electronic copy of the music by using the writing functions of the interactive whiteboard. Within each group they proceeded to record their analyses on the electronic copy on the interactive whiteboard one at a time to create a single, combined copy, as shown by the still frames derived from videos in Figure 3.

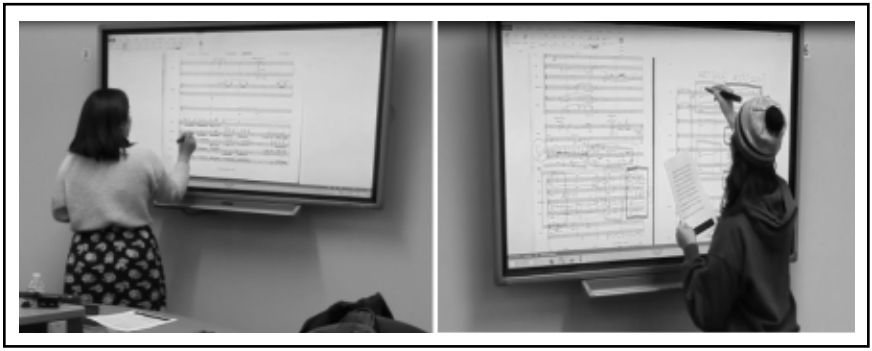


Figure 3. Students inputting their analyses into a single, combined copy

Although the recording of the micro-analyses was done independently, the shift to group interaction occurred when students looked at their peers' analyses on the interactive whiteboard and noticed similar patterns to those in their own sections of the same song (see Figure 4). This generated conversations among group members with lots of pointing to specific areas of the piece on the interactive whiteboard, and caused some members to return to their paper scores to reanalyze their sections, looking for these patterns.

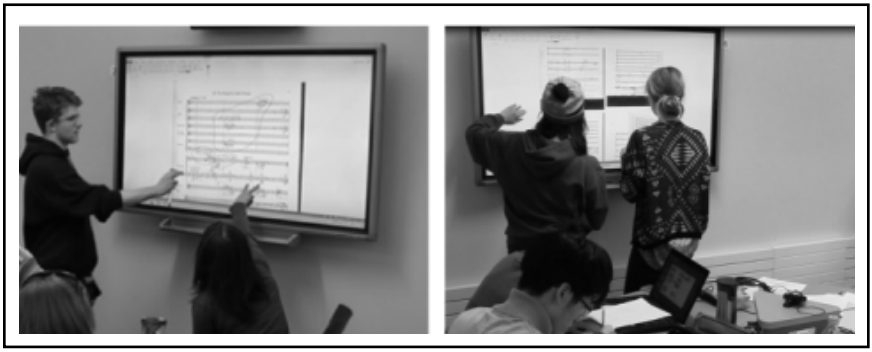


Figure 4. Students discussing connections between sections of the music on the interactive whiteboard

For the second videotaped session, students spent a majority of their time at the interactive whiteboards, either making connections

between sections of the music or looking through the entire song to find larger patterns of meaning in the piece—in other words, conducting "macro-analyses" (see Figure 5). Students took turns taking the lead at the interactive whiteboard in order to explain or present what they had noticed to others in their group. This generated discussion among group members, with students asking their peers to go back to earlier sections, causing the group to re-analyze previously identified patterns together, and begin to make notes about their overall findings. Some students presented their findings the same way to the instructor, using the interactive whiteboard and gesturing to the links and patterns they saw in the music.

Figure 5. Students presenting information on interactive whiteboards and finding larger patterns of meaning in the piece

The mode effect was thus clearly demonstrated through having the scores available in both paper (score) and electronic (interactive whiteboard) forms: students used the different modes for different purposes. The paper copy of the music allowed for students to divide the piece into manageable sections and have each member of the group complete a very close and detailed analysis of their assigned section (i.e., micro-level analysis). Individual analyses were recorded on paper, and later transferred to a single, combined copy on the interactive whiteboard. The interactive whiteboard allowed all group members to see the larger patterns in the music among the sections of the piece, be able to effectively communicate their findings to group members and the instructor, and ultimately understand the piece as a whole (i.e., macro-level analysis).

Team-Based Learning

Team-based learning emphasizes the need for diversity in groups in order for them to function effectively and to develop as a peer learning team.[20] "Diversity" is understood to refer both to students' academic ability and level of relevant experience, and demographic characteristics such as gender. Prior to establishing the groups for the advanced analysis course, the instructor received the student grades from the prerequisite post-tonal theory course, which most students had completed in the previous term, as well as helpful insights from the instructor of the prerequisite course concerning individual behavioral characteristics such as individual comfort levels with speaking in class. In creating the groups for the course, an attempt was made to achieve diversity in ability/experience (as reflected in grades), gender, and social characteristics. While some students were disappointed about not being given free rein in forming their own groups, Michaelson and Sweet point out that self-selection inevitably leads to potentially disruptive coalitions within groups as people seek out those similar to themselves.[21]

Although students were oriented to strategies and personal attributes for effective group work in the first class through the informal discussion mentioned earlier, many of them had never worked in heterogeneous groups before and it took some time for the groups to coalesce. Students were encouraged to decide as a group how to divide up work for tasks, and having them working on a group project (preparing a group presentation) from the first day forced group members to grapple with this issue immediately. The instructor observed that students quickly devised ways to distribute tasks, not least because the songs themselves were long and complicated and beyond the analytical means of a single group member. Students also took on roles within their groups that suited

[20] Michaelsen and Sweet, "The Essential Elements of Team-Based Learning," 9.

[21] Ibid., 10–11. Despite a few initial expressions of dismay about not being paired with friends, the students accepted the rationale of the TBL model. As the course progressed, the contrast between completing analytical tasks in their assigned heterogeneous groups and mingling freely during mid-point "health breaks" helped to differentiate these activities. As a result students appeared to be very focused when working in their groups, and relaxed and enjoying the freedom of wandering around and chatting during the breaks.

their individual strengths and interests. For example, in one group a more introverted student with language challenges but excellent technical skills chose to navigate and annotate the scores projected onto the interactive whiteboard, while fellow group members took on more vocal roles. Inevitably leaders emerged in groups, although this also caused friction at times when group members felt a leader was not engaging them sufficiently in consultation.

A peer evaluation exercise occurred twice during the course, and both highlighted those aspects of peer interaction that were working and revealed some gaps and unresolved issues in group communication. Halfway through the course, students completed the first, formative peer evaluations of their group members (and themselves) with the explicit goal of helping their teammates improve. Each student was asked to assign a score for each group member to reflect the extent to which they felt the other group member had contributed to their learning so far in the course. Students were told to consider their teammates' preparation (having done the analysis, readings, research, thought about the issues, posed questions), contribution (attendance, ideas), and their respect for, and encouragement of, others' opinions and ideas. Each group member had 50 points to distribute amongst the five members, and they were told they had to assign at least one score of 11 and one of 9 (to prevent a reflexive assignment of 10 for every group member). They were also asked to write at least one thing that each group member did that helped the evaluator or the team learn, and one thing that they would like to see more of from the group member. The points were then averaged and the anonymous feedback aggregated by the instructor, and this feedback was given to each student. The second peer evaluation exercise took place at the end of the term. This time in addition to assigning points to group members, each student had to write a short reflection about how they had used the formative feedback they had received midterm, and the assigned points generated a summative mark that contributed to the final grade.

In most cases, students found the formative feedback valuable and they enjoyed the positive reinforcement from their peers. In a few instances, the feedback brought to light simmering tensions that could then be addressed more openly. For example, after the midterm evaluations the instructor was contacted by one student who felt so hurt by the feedback he'd received that he was uncomfortable coming to class. Since the underlying issue was

one of cultural norms for communication (he was an international student), as well as advising the student, the instructor took the opportunity to lead a discussion with the entire class in which cultural sensitivity and acceptance of diversity were explored. The student was reassured, and group interactions improved. The students were less satisfied by the second round of peer evaluation and were particularly uneasy about bearing the responsibility for assigning a component of their peers' final grades.

As a way to gain insight into how student attitudes towards music theory and pedagogical approaches changed over the twelve-week term, the instructor designed a pre-post research study in the form of a questionnaire that was completed anonymously by students in the first class and again in the last. Twenty-one students completed the first questionnaire (two later dropped the course) and nineteen completed the second. Comprising seventeen statements describing beliefs about music theory, analysis, and learning, respondents rated their agreement with each statement on a 5-point scale: strongly disagree, disagree, neutral, agree, and strongly agree. The survey included two statements about group work: "I feel comfortable in a group doing music analysis," and "Doing music analysis on your own yields better results than doing it as a group." In the graphs in Figure 6 and Figure 7, the scores have been aggregated for each question, with graphs showing percentage responses comparing the first class with the last class. Although the numbers of respondents is too low to be statistically significant, it is interesting nonetheless to see how the attitudes of this class shifted over time.

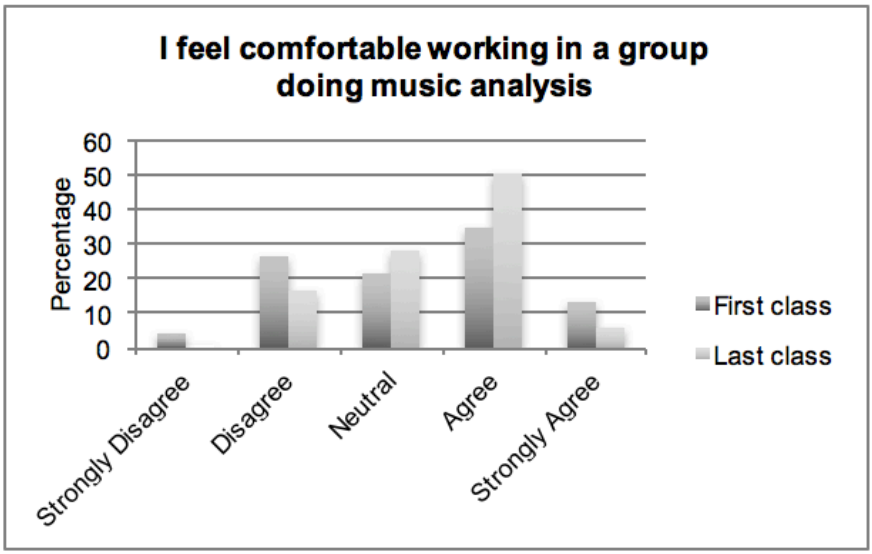


Figure 6. Aggregated student responses to comfort with group work

In terms of their comfort level with group work, Figure 6 shows a shift to the more positive side of the scale, suggesting that constructive development took place through intra-group student interactions over the term. This interpretation is consistent with the instructor's observations and the videotaped footage from the classes.

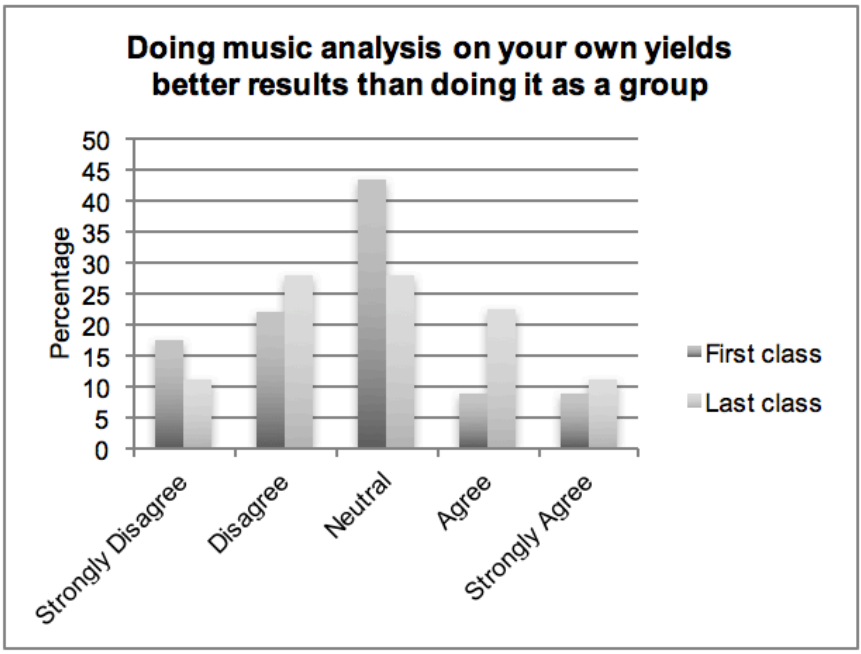


Figure 7. Aggregated student responses to efficacy of group work

On the other hand, Figure 7 shows that while nearly 50 percent of students started with neutral feelings about how the quality of analytical results would be affected by working individually or in a group, by the end of the course there was a more even distribution across the scale: through experience, previously neutral students formed an opinion about the statement. The higher response rate on the positive side at the end of the class (i.e., by students who felt that doing analysis on their own would yield better results than in a group), does not resonate with the results of the video analysis, nor with the instructor's perspective on the quality of the work produced by the students. In the instructor's experience with other similar courses, taught without the focus on peer interaction, the level of work in the flipped course was far more consistent, with final essays ranging from good to excellent. Although there was variation in the quality of writing, none of the final analyses were weak. External validation came after the course when one of the essays won the music department's prize for the "best essay in music theory, analysis, or musicology."

Group interaction and effective collaborative work practices were facilitated through the classroom technology, as verified by analysis

of the videotaped classes. Indeed, in addition to becoming more at ease with group work as the course progressed, as discussed above, students also indicated being increasingly comfortable with using technology in their learning (see Figure 8). The flipped classroom model forced students to use the course website because it was an integral part of their weekly learning in the course, while the video footage showed that students used the classroom interactive whiteboards much more frequently in the second filmed session than in the first.

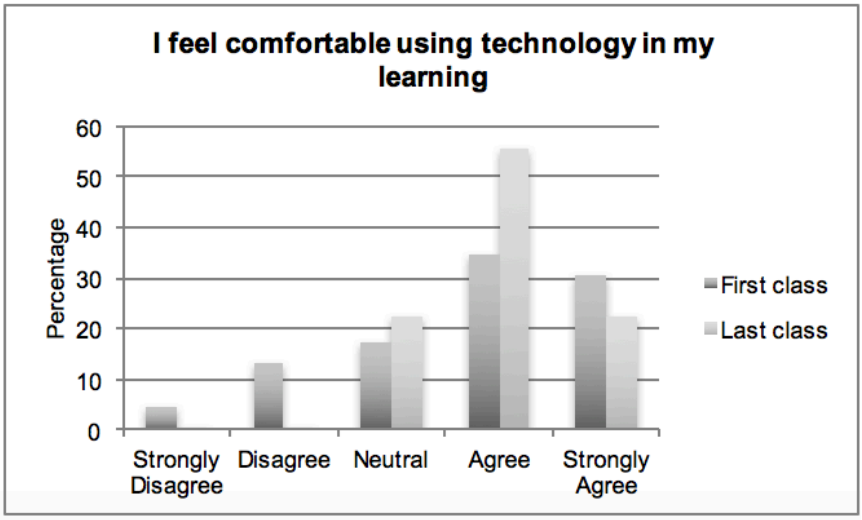


Figure 8. Aggregated student responses to comfort with technology

Lessons Learned

Using the flipped model for the first time in an advanced analysis course undoubtedly carried some risk for both the students and the instructor, and there were aspects that could be revised and improved. Overall, however, student feedback and performance on assessments confirm that the model effectively supported the desired learning outcomes for the course, which included the ability to

- articulate common organizational features in Carter's music;
- describe the process to follow when researching unfamiliar music;
- apply relevant analytical tools to conduct original research into organization in post-tonal music;
- integrate and select data to support an interpretation of a piece;
- write about music using a style appropriate to theoretical analysis; and
- demonstrate the communication and collaboration skills needed for successful group work.

While only the last learning outcome speaks specifically to the flipped model and TBL, we would argue that the extraordinary level of student engagement generated by the model was a critical factor in helping all of the students to achieve these outcomes, regardless of their skill level, background experience, or interest in the subject matter. Attendance remained unusually high throughout the course and students often stayed longer than the scheduled three hours (on a Monday night!). On occasion, class members brought other music student friends to class, for no apparent reason beyond that it was an interesting place to be. In the standard student satisfaction survey administered at the end of the term, the course components that were most often cited as being valuable to their learning were group work, technology, and health breaks (mid-class, fifteen-minute movement and nutrition breaks that were led each week by a different student group). In their feedback, students mentioned how much they enjoyed doing primary research and being the first people to analyze these recent songs. They also commented on the value of the group work: "the group work aspect was very interesting and well implemented—it really allowed for the learning to be student-oriented as we learned

through actually doing the work"; and on the course format: "I like the blended learning style in that it allowed more class time to work with our groups and ask questions instead of just being lectured at." Several students complained about having to sing the vocal line of their songs in class, but they also acknowledged the value of doing so. As discussed earlier, there was a relatively high level of discomfort with contributing to the final grades of classmates through the summative peer evaluation; most students would have preferred only to use this evaluation in a formative way.

Developing a flipped format course required a tremendous amount of thought, planning, and preparation of materials on the part of the instructor prior to the start of the course. In this case, the instructor was fortunate to have access to expert assistance from teaching and learning specialists as well as instructional technology support. Teaching and learning specialists advised on pedagogical issues such as optimal group sizes and effective ways to use TBL, how to design multiple choice questions to require higher order thinking skills, and how to use peer evaluation effectively, while the instructional technologist helped with aspects of the course website (such as setting up automatic grading of online quizzes) and with the interaction between classroom technology and the website (for example, how to download an annotated score from the interactive whiteboard onto the website so that students could access it later). The university's copyright librarian also assisted with setting up e-reserves on the course website. These resources were essential to the success of the course. Although the workload was very heavy for the instructor prior to the start of the course, once the semester started, far less preparation was needed than in a traditional course and it flowed relatively effortlessly. Most of the course format could be retained for another offering of the course, but new music would need to be selected in order to preserve the focus on original inquiry, necessitating another investment of time and effort on the part of the instructor.

Some aspects of the flipped format presented challenges that could be addressed in future offerings of this or similar courses.

The focus on group work meant that there were very few activities in which the whole class participated or that involved interaction between the groups, other than a "jigsaw" activity near the end of term where students from one group taught their piece to students in other groups. A better sense of class cohesiveness would be fostered through more of these activities. Finally, it is important to understand and accommodate the level of student preparedness for an innovative teaching approach. The students in this course were unaccustomed to group work, a factor that likely played a significant role in their perception that doing analysis independently would have produced better results. With fewer peer experiences, the negative experiences (e.g., social loafing in which peers may not pull their weight in the activities) tend to be more prominent than the positive experiences (e.g., higher order thinking and personal growth), causing students to be more cautious about stating that they prefer peer learning to independent learning.[22] Furthermore, students who have not have worked with their particular group members before may find it difficult to establish relationships with new peers in a short period of time.[23] In future flipped offerings, the instructor plans to adopt the strategies suggested by Shimazoe and Aldrich to help establish positive perceptions of group work: incorporating more activities at the start of the course to help students develop essential skills for working with peers, addressing concerns about their resistance to working with peers, and perhaps even providing visual tasks for students to see their group's progression, such as using handouts to record the group's accomplishments each class.[24]

For the instructor, the flipped class exceeded expectations and stood out as a highly rewarding teaching experience. Not only was the instructor satisfied with the level of analytical insight and the parity among students, but it was also liberating to set aside the role of "all-knowing expert" in favor of applying experience and expertise to guide students through a process of collaborative discovery. By avoiding the traditional expert-novice dichotomy, communication between the students and instructor occurred in a

[22] Junko Shimazoe and Howard Aldrich, "Group Work Can be Gratifying: Understanding & Overcoming Resistance to Cooperative Learning," *College Teaching* 58, no. 2 (2010): 52–53.

[23] Ibid., 53.

[24] Ibid., 53–55.

more natural and open way, facilitating informal interactions about important issues such as the relevance of music theory to the world, the role of classical music in twenty-first century culture, and their career possibilities.

Appendix A: Course Timeline

Weeks	**Topic**	• In-class activities	• Out-of-class activities
Week 1 5–11 January	Text	• Introductory activities and orientation around course goals, structure and content • Begin group analysis of your poem/song	• Research your poetry topic and prepare group Poetry Presentation using PowerPoint slides (Assignment #1) • Submit PowerPoint slides via Moodle by Sunday 11 January 11:55 pm • Practice singing vocal line of your song
Week 2 12–18 January	Pitch	• Group Poetry Presentations (Assignment #1) • Begin group pitch analysis of your song	• Review and practice set class analysis (see Straus Ch. 2) in preparation for Test #1 • Prepare to sing vocal line as group
Week 3 19–25 January	Pitch	• Test #1: set class analysis • Sing vocal line of your song as a group • Continue group pitch analysis of your song	• Read Boland article and complete Online Quiz #1 by Sat. 24 January 11:55 pm • Continue pitch analysis of your song

Appendix A: Course Timeline *(continued)*

Week 4 26 Jan– 1 Feb	Pitch	• Continue group pitch analysis of your song	• Write an individual summary of pitch organization in your song following Pitch Analysis Summary guidelines
Week 5 2–8 February	Pitch	• Bring individual pitch analysis summaries to class and integrate into a group Pitch Analysis Summary (Assignment #2) for your song, to be submitted via Moodle by Wed. 4 February 11:55 pm	• Graded group Pitch Analysis Summaries (Assignment #2) will be returned to you before class
Week 6 9–15 February	Pitch Rhythm	• Extend pitch analysis of your song in response to feedback from group Pitch Analysis Summary • Start writing Individual Pitch Analysis Paragraph (Assignment #3) following guidelines • Complete peer evaluation	• Individual Pitch Analysis Paragraph (Assignment #3) to be submitted via Moodle by Fri. 13 February 11:55 pm • Read Bernard article and practice rhythmic exercises in preparation for Test #2
Week 7 23 Feb– 1 March	Rhythm	• Test #2: rhythm - based on Bernard article • Begin group rhythmic analysis of your song	• Prepare group Percussion Composition (Assignment #4) • Continue rhythmic analysis of your song

Appendix B: Sample weekly schedule

Week 3: 19–25 January

In the third week of this course we will focus on pitch analysis. You will write the set class analysis test, analyze the vocal line of your song, and read an analysis of "harmonic flow" in similar music by Carter. You will also sing the vocal line!

Learning Outcomes

On successful completion of this week's activities, you will be able to:

- Identify some features of pitch organization in your song
- Sing the vocal line of your song
- Articulate the main points of Boland's article
- Explain the all-trichord hexachord

In class activities

The set class analysis test will allow you to evaluate your fluency with set class analysis and identify any weaknesses. We'll grade it in class and if you don't pass, you will need to retake the test until you do. Each group will sing the vocal line of their song – with the aid of a soft instrument if necessary. You will spend the majority of class time working on a set class analysis of the vocal line of your song.

Our Health Break will be led by Group B

Out of class activities

In addition to continuing your pitch analysis of your song (which you should return to in small chunks whenever you can), you will read Marguerite Boland's article on "harmonic flow" in Carter's *Con Leggerezza Pensosa*, and complete the online comprehension quiz on the reading before midnight on Saturday 24 January.

Reading Guide:

- Listen to this short piece – different recordings are available on YouTube
- Read the article twice
- Make sure you know what the "ATH" is (see p.33), but otherwise you can skim through the introduction up to p. 36

- Give the rest of the article, especially p. 36-top of p. 42, a close reading, making sure you study the annotated musical examples so that you understand the text. It's dense! But this is how one writes an analysis and Boland's language is simple and clear. Look up any technical words you don't understand. Note the distinction between pitch and pitch class elements.

- You don't need to remember any particular details about this piece, but knowing more about how Carter organizes pitch will be very useful to you.

Readings and viewings

Marguerite Boland, "'Linking' and 'Morphing': Harmonic Flow in Elliott Carter's *Con Leggerezza Pensosa*," *Tempo* Vol. 60, No. 237 (July 2006): 33–43.

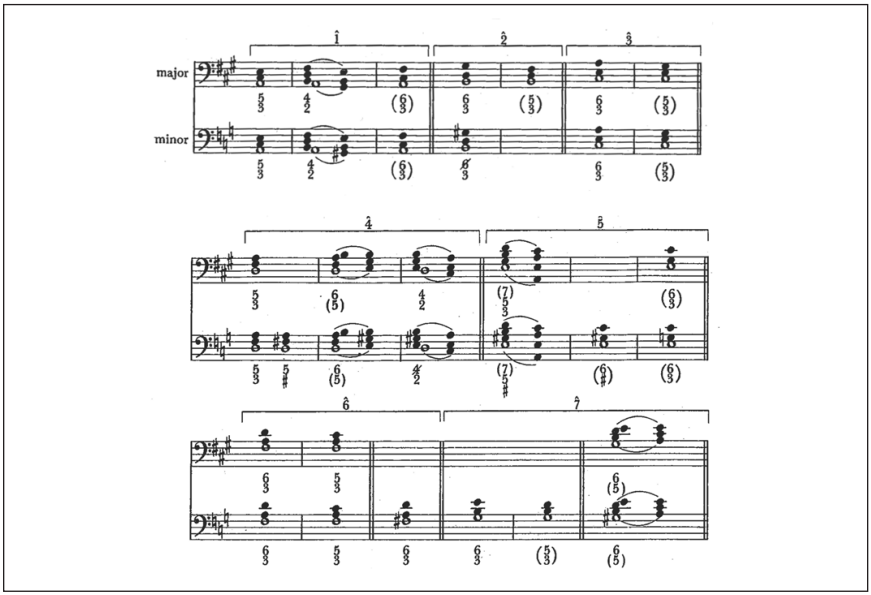
What are Years (https://www.youtube.com/watch?v=ZtxE9Q_ie2k)

Three *Leçons* in Harmony: A View from the Nineteenth-Century Paris Conservatory

By Michael Masci

INTRODUCTION:
Toward a Reconstruction of Harmony as a Discipline

In discussing the rule of the octave from Johann David Heinichen's 1728 *Der Generalbass in der Komposition*, Robert Gauldin remarks upon an important feature of this well-known text that is both pedagogically significant for the modern music theory teacher, as well as methodologically significant for the historian of music theory (his summary is reproduced as Example 1).



Example 1. Gauldin's summary of Heinichen's rule of the octave, from *A Practical Approach to Eighteenth-Century Counterpoint,* Example 1-7, pp. 9–10

As Gauldin notes, while Heinichen's *regola* relies upon a number of familiar scale-step prescriptions, it does not address the issue of harmonic tendency.

Gauldin writes:

> For the most part, this chart does not tell us the tendency of a bass note, with its supporting chord, to move to another bass note and chord. It does not establish the probability for chordal succession. Heinichen suggests eight rules for this. . . . From such lists of "expectations" may be deduced a general theory of harmonic function in this period. This was Rameau's great contribution although he explained it in terms of a hypothetical fundamental bass.[1]

Gauldin then proceeds, via this invocation of Rameau, to summarize these principles for chordal succession in terms of the three primary categories for harmonic function and tendency—those of tonic, dominant, and pre-dominant—illustrating them with the familiar figure below.

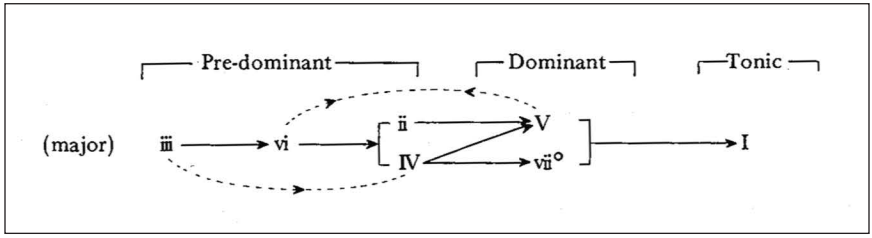


Figure 1. Harmonic functions in Gauldin's *A Practical Approach to Eighteenth-Century Counterpoint,* Figure 1-1, p. 11

Gauldin's presentation of Heinichen engages not only what is perhaps the central rub between our current music theory pedagogy and those of centuries past, but also rehearses a common interpretation of, as well as reaction to, these earlier traditions. That is, many of our predecessors did not rely on a notion of harmonic tendency or syntax when teaching the practical subject of harmony.[2] For many of us today, as well as for our students, however, writing even the simplest harmonic progression without such a concept is literally unthinkable. How would one even begin? Encountering these historical texts, and their apparent theoretical lacunae, therefore often elicits an act of translation on the part of the

[1] Robert Gauldin, *A Practical Approach to Eighteenth-Century Counterpoint* (Prospect Heights, IL: Waveland Press, 1995), 9–10.

[2] For the purposes of the discussion here, I shall use the three terms "tendency," "function," and "syntax" largely interchangeably.

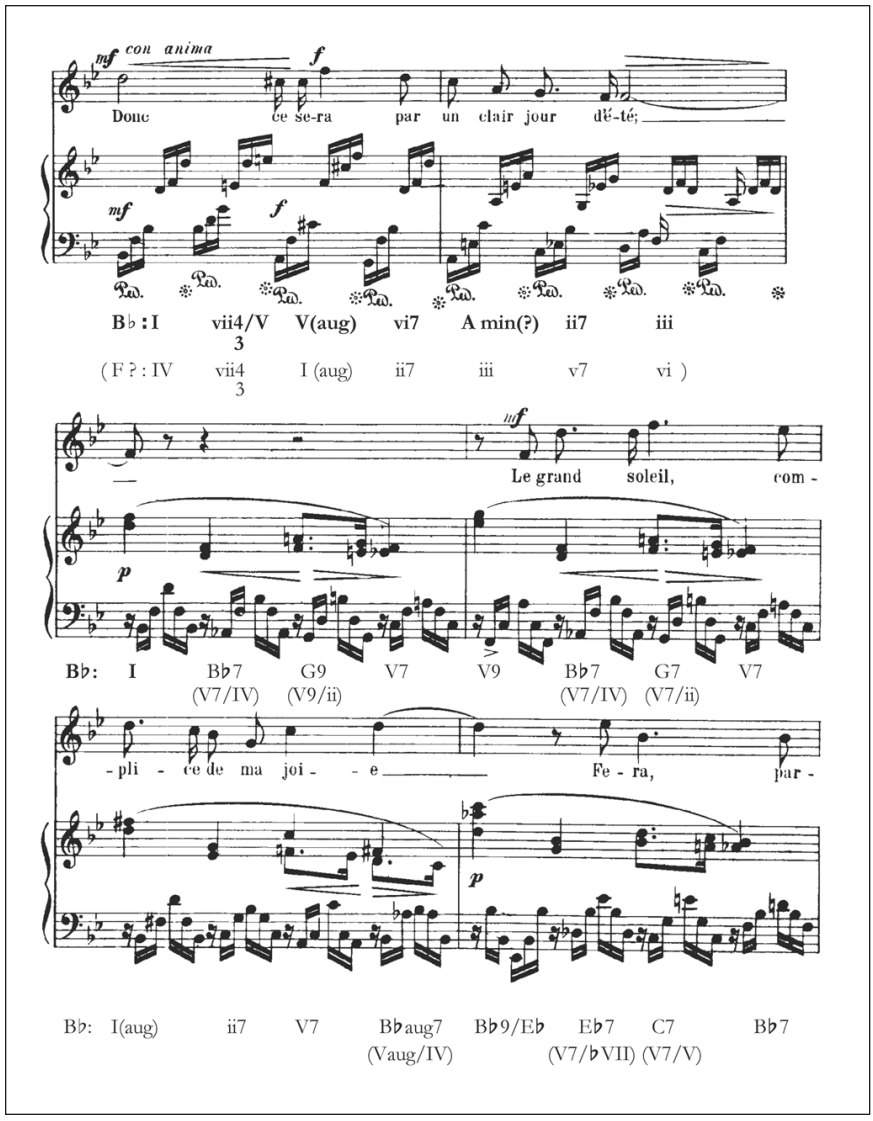
modern-day music theorist and pedagogue. On this score Gauldin obliges, rendering Heinichen's rule of the octave in terms of a more familiar model of harmonic tendency and tonal syntax. Gauldin's reading of Heinichen thus reflects how thoroughly a notion of harmonic tendency is imbricated in our methods as historians, music analysts, and teachers of practical music theory: the concept of tendency or function has become one of the primary means by which we not only interpret past texts and analyze scores, but also by which we teach practical music theory subjects such as harmony.

Yet despite the recentness of this pedagogical development—as I will discuss below, notions of harmonic tendency and function remained largely foreign to practical harmony pedagogy through the nineteenth century—the broad reliance on models of harmonic function for teaching practical subjects such as harmony has transformed the content and form of music theory pedagogy in a number of important ways. Perhaps most significantly, this modern approach trades on what may be referred to as an "applied theory of harmonic function." That is, it represents the application of a descriptive model, developed for the purposes of analyzing harmonic relationships, to the very different and practical task of teaching students to generate and compose normative harmonic progressions. For instance, when teaching students how to generate harmonic progressions, we frequently translate *analytical descriptions* of harmonic function into *practical prescriptions*. The descriptive, analytical statement that, "In tonal repertories, pre-dominant harmonies most frequently move to dominant ones," is translated into the practical, compositional prescription, "move ii to V!"

Yet however familiar (and unremarkable) this sort of applied theory of harmonic function may be in practical theory pedagogy today, such an approach faces certain familiar limitations—limitations that become most apparent when dealing with chromatic harmony. In particular, while descriptive models of harmonic tendency and function offer a powerful tool for analyzing chromatic harmony, such notions often prove unwieldy when adapted to compositional exercises in which we ask students to generate chromatic progressions. In other words, there is an asymmetry between the descriptive, analytical merit of the concept of harmonic function and its practical, compositional efficacy, particularly when it comes to chromaticism. To illustrate this asymmetry, take the opening of Fauré's "Donc, ce sera par un clair jour d'été" from *La Bonne Chanson* (see Example 2). A pair of measures ambiguously

bookends the passage, circling B♭ and F major, as well as hinting at B♭ lydian and F mixolydian. The interior of the passage consists of chains of dominant seventh chords in various inversions, analyzed here in terms of chord roots. When confronted with a passage like this—with its chromatically rich and varied progressions, and its rapidly shifting suggestions of various modes and keys—many students would likely object to any functional analysis offered as the basis for generating a similar chord progression, protesting that it has "too many rules" for what chord is to follow what other chord. How could one ever conceive of all the functional relationships necessary to compose such a passage when almost every chord contains a chromatic alteration? In other words, the syntactic analysis, despite its descriptive merit, becomes too conceptually dense and cognitively burdensome when adapted for practical, compositional purposes.[3]

[3] To be clear, the suggestion here is *not* that Roman numerals are, prima facie, inadequate for the task of analyzing Fauré's music and that relying on notions of diatonic syntax for compositional purposes is *therefore* similarly fraught. If this were the argument here, it could rightly be accused of relying on a straw man; who would use Roman numerals to analyze Fauré in the first place, critics could object. Such an objection, however, presumes a form of symmetry between the descriptive, analytical merit of a concept on the one hand, and its compositional efficacy on the other. But it is precisely this sort of presumption—one that courses unexamined throughout our practical theory pedagogy—that the example of Fauré here is mean to problematize. To the contrary, as I have shown in Example 1, I believe we can adequately analyze Fauré's music in terms of Roman numerals and functional roots, and that such an analysis, with all of its complex symbolic renderings, does, in fact, capture something of our intuition regarding the complexity of the harmonic relationships in question when considered from such a functional point of view. Consequently, and as a logical matter, the compositional limitations of the concept of harmonic function *must lay elsewhere than in its descriptive inadequacy for analyzing this music, as the concept of harmonic syntax exhibits no such inadequacy*.



Example 2. Gabriel Fauré, "Donc, ce sera par un clair jour d'été," mm. 2–11

This particular difficulty with an applied theory of harmonic function—namely, the asymmetry between its descriptive, analytical merit and its practical, compositional efficacy particularly when dealing with chromatic harmony—stems, I would suggest, from a crucial logical conflation embedded within this sort of applied theory as a whole. Namely, our applied theory of harmonic function mistakenly identifies a description of the *ends* of the compositional

process with a description of its *means*. Just because we may accurately describe the harmonies in a Bach chorale as moving from I to ii^6 to V, etc., does not mean that Bach *began* by writing a tonic triad, *then* an inverted supertonic, *then* a dominant, etc. Rather, the functional analysis describes the *products* or *ends* of Bach's compositional process, once it was complete and the harmonies had been determined. In other words, while an analysis of functional relationships may accurately describe certain features of the *ends* of the compositional process (i.e., the left-to-right syntactic relationships of the harmonies that resulted from some compositional process), this can in no way be taken as a description of the particular process or method by which the composer arrived at them. Yet this is precisely what our applied theory of harmonic function does: it treats the analysis of the left-to-right functional, harmonic process as a description of the compositional process itself.

Furthermore, given this fundamental logical confusion (and as the complex analysis of Fauré suggests), a continued appeal to, or refinement of, a theory of harmonic function would not effectively redress the logical gap that extends between a description of the ends of the compositional process and a description of the process itself. Getting our students to learn how to write chromatic passages, in other words, is not simply a matter of offering them a more detailed analysis of Fauré, or making our models of harmonic function more comprehensive by incorporating notions of secondary borrowing, applied subdominants, or the like into them. Such a tack would be "more of the same"; it simply continues to describe the compositional ends using more complex language, while not addressing its precise means. What is needed, then, is a description of a compositional process that is not reduced to the description of those ends that the compositional process itself is meant to produce.

Yet what would such a description of the compositional process look like if not a description of left-to-right harmonic syntax? To answer this question, we may wish to consider historical methods for teaching harmony, since as mentioned, harmony teachers, well into the nineteenth century, did not rely on such notions when it came to teaching practical compositional subjects like harmony. An examination of historical techniques would therefore prospectively offer us insights into how composers, like Fauré, arrived at composing in such a rich chromatic idiom without possessing an explicit notion of harmonic tendency or function. Just as significantly,

a consideration of these techniques can inform both our teaching of chromatic harmony today, as well as help our students understand and generate these sorts of complex chromatic progressions. In what follows, then, I would like to offer an initial reconstruction of some of the basic techniques and methods that, in lieu of an applied theory of harmonic function, provided the foundation for the discipline of practical harmony in late nineteenth-century France. Two pillars supported the overall pedagogical approach at that time: that of a generalizable diatonic (rather than specifically "functional" or "tonal") voice-leading grammar for triads and seventh chords, and the subsequent application of chromaticism to this grammar. In addition, and contrary to what our current reliance on theories of harmonic tendency and function might suggest to us as music analysts, the chromatic style of the late nineteenth century did *not* evolve from the development of a more explicit and complex theory of harmonic function, but rather resulted from a simplification of practical harmony pedagogy all told. In considering some of the pedagogical techniques that underpinned chromatic practice in late nineteenth-century France, and furthermore by showing how they represent a simplification of method, despite the more complex analytical language needed to describe their compositional results, this article hopes to outline a series of basic techniques that may make chromatic harmony more practicable in today's music theory classroom precisely by developing concrete strategies for teaching voice leading.

With these aims in mind, the discussion below summarizes some of the basic voice-leading methods for triads and seventh chords, as well as their common chromatic elaborations, found across a range of nineteenth-century French harmony texts, taking Émile Durand's 1881 *Traité complet d'harmonie théorique et pratique* as a point of departure.[4] Accordingly, I divide the discussion below into three *leçons*. The first lesson reconstructs a foundational grammar

[4] Émile Durand, *Traité complet d'harmonie théorique et pratique* (Paris: Leduc, 1881). All subsequent parenthetical references will be to this edition. Professor of harmony and composition at the Paris Conservatory from 1871 to 1883, Durand taught a generation of composition students, including Pierné and Debussy. His *Traité*, notoriously conservative while situated at the cusp of the advent of modern harmony, is the work for which he is most remembered. Fitting squarely into the Conservatory mold, the *Traité* reflects and adapts the methods of the previous generation of harmony professors, including those of his own teacher François Bazin as well as Henri Reber. Bazin's *Cours d'harmonie théorique et pratique* (1858)

of diatonic voice-leading techniques for triads as pieced together from examples in Durand's text, considering its relationship to the rule of the octave. The second lesson extends this grammar to seventh chords by means of a principle that I will refer to as the "complementarity of 5 and 6 realizations." The third lesson then considers Durand's chromatic adaptations of these voice-leading techniques for composing what he calls "passing modulations," noting in particular how his treatment of modulation represents a simplification of technique when compared to writings of theorists from the first half of the century, most notably those of Alexandre Choron. Next, I briefly return to Fauré's "Donc, ce sera," applying these three lessons to account for the pervasive chromaticism of the opening passage. Lastly, I conclude by considering what these three leçons learned from Durand's text may offer our practical harmony teaching today in terms of concrete pedagogical strategies, as well as how these strategies may inform our understanding of our own applied and integrated theory pedagogy.

Lesson 1: A Diatonic Voice-Leading Grammar for Triads and its Relationship to the Rule of the Octave

As a historical matter, we can say with relative certainty that Fauré did not possess our applied notion of function or harmonic tendency, and that, a fortiori, it could not have figured in his compositional method in any explicit way.[5] Furthermore, while we may easily explain the absence of applied notions of harmonic tendency from early eighteenth-century texts such as Heinichen's—such notions would not be widely available to music theorists until the dissemination of Rameau's theories in the mid- to late-eighteenth century—this explanation does not account for another, even more remarkable fact in the history of pedagogical music theory: even after the widespread dissemination of Rameau's theories, the majority of nineteenth-century music theorists, and particularly those associated with the National Conservatory in France, still rejected the notion of the fundamental bass as an

and Reber's *Traité d'harmonie* (1862) are arguably the two most significant harmony texts produced in the generation following Fétis.

[5] See notes 7–9.

adequate foundation for teaching practical harmony.[6] In lieu of Rameau's prescriptive fundamental bass, nineteenth-century harmony teachers in France relied instead on a number of keyboard-driven techniques, the roots of which can be traced back to Italian keyboard and partimento traditions of the previous century.[7] Along these lines, texts as late as Durand's 1881 treatise included some version or remnant of the rule of the octave. In the hands of Durand and his contemporaries, however, the rule did not function as a mnemonic, pointing to broader functional considerations. Rather, the rule acted as a tool for refining basic harmony and voice-leading techniques that a student had previously mastered. To see this, let us consider Durand's use of the *règle de l'octave* within the broader context of his treatise.

[6] For a brief history of Rameau reception in the early years of the Paris Conservatory see, Cynthia M. Gessele, "The Conservatoire de Musique and National Music Education in France, 1795–1801," in *Music and the French Revolution,* ed. Malcolm Boyd (New York: Cambridge University Press, 1992), 191–210. Furthermore, as I have suggested elsewhere, this rejection of fundamental bass theory would have far reaching implications for the practical music writing disciplines of harmony, counterpoint, and composition in France long after the initial debates surrounding the specifics of Rameau's own theories subsided. Significantly, it would mean that the theoretical and practical studies of harmony would remain relatively distinct in France throughout the nineteenth century, with notions of harmonic function, in the manner of Rameau's fundamental bass progressions, being reserved for largely theoretical writings or more speculative moments of practical treatises. Unlike our harmony pedagogy today, that of nineteenth-century France was consequently not predicated on the integration of the theoretical and practical studies of harmony by means of an applied theory of harmonic tendency or syntax. For further discussion see Michael Masci, "Theory as Practica: The Theoretical Study of Tonality and the Practical Study of Harmony in French *Harmonie Pratique*," *Theoria 20* (2013): 5–37.

[7] These techniques included a form of simplified thoroughbass, methods for realizing figured and unfigured basses, techniques for harmonizing melodies, and even techniques for realizing partimento fugues. For the transmission of Italian pedagogy into France see Rosa Cafiero, "The Early Reception of Neapolitan *Partimento* Theory in France: A Survey," *Journal of Music Theory* 51 (2007): 137–59, as well as Robert O. Gjerdingen, "Harmony without Theory: Apprenticeship at the Paris Conservatory" (paper presented at the annual meeting of the American Musicological Society and the Society for Music Theory, Milwaukee, Wisconsin, November 6–9, 2014).

Durand's Traité includes a single version of the rule of the octave that he summarizes in a table, reproduced below as Table 1. As is customary in French treatises, Roman numerals designate scale degrees in the bass—rather than scale degrees of chord roots—and Durand prescribes specific sonorities depending on whether the scale degree in question proceeds to move by step or by leap. For instance, if scale degree II in the bass proceeds by leap, it takes a "5"—in terms of figured bass—and is realized as supporting a root-position triad. When moving by step, however, it takes a "6" and supports an inverted triad. We may interpret most of Durand's prescriptions in terms of familiar patterns of harmonic tendency. This particular prescription suggests that II supports a pre-dominant when moving by leap, but supports a linear dominant when moving by step. In any case, as Gauldin points out with respect to Heinichen's thoroughbass treatise, Durand's rule makes very few actual prescriptions based on a notion of harmonic tendency. He does not, for instance, stipulate when II must move by leap or by step, or to what scale degrees it should move. Durand only tells the student *how* to accompany II in the case that it *does* move by step or leap. Durand's only explicit remark regarding harmonic tendency pertains to ascending stepwise bass motion to the dominant, noting that such motion usually occurs by means of an inverted supertonic triad rather than a root-position subdominant.

Scale Degree	In the case that the scale degree needing to be harmonized proceeds to the following note by step, use:	In the case that the scale degree needing to be harmonized proceeds to the following note by leap and in particular by leap of a 4th or 5th, use:
I	5	5
II	6 or $\frac{6}{4}$	5
III	6	6
IV	5 or 6	6
V	5	5
VI	6 or 5	5 or 6
VII	6	6

Table 1. Scale-step prescriptions from Émile Durand, *Traité complet d'harmonie théorique et pratique* (1881), p. 119

The functional implications of Durand's prescriptions, however, are not the only significant feature of his discussion of the rule of the octave. Of equal note, Durand devotes little attention to the rule, affording its illustration barely nine pages over the course of his five-hundred-page tome. This stands in marked contrast to the extensive exposition that the rule receives in treatises from the first half of the nineteenth century. Alexandre Choron's *Principes de composition des écoles d'Italie* from 1808, for instance, includes almost one hundred different versions of the rule of the octave, as compared to Durand's single version. While we may not wish to equate the brevity of its treatment with pedagogical insignificance—other important topics receive short shrift in Durand's treatise—Durand's minimal discussion of the rule reflects the mixed status that it held as a pedagogical tool by the late nineteenth century. Henri Reber, for instance, in his 1862 *Traité d'harmonie* (from which Durand borrows liberally), describes the rule as antiquated and dismisses its usefulness altogether.[8]

In addition to its light treatment, Durand's specific placement of the rule of the octave within the overall organization of his text is equally significant. Durand's treatment of the rule *concludes* his discussion of triadic harmony rather than begins it. Durand's examination of "consonant harmony"—section 1 of his treatise—addresses scales and intervals (chapter 1); triads and three-part harmony (chapter 2); four-part harmony, including doublings (chapter 3, §§ 174–81), root-position progressions (§§182–6), progressions using triads in first inversion (§§187–92), and progressions using triads in second inversion (§§193–200); arpeggiating through various inversions and positions of triads (chapter 4); rhythm (chapter 5); phrases and cadences (chapter 6); sequences (chapter 7); choice of sonority and scale-steps (chapter 8); and harmonizing a melody or *chant donné* (chapter 9).

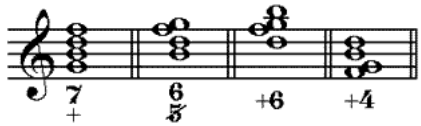
Given this particular organization, a number of model progressions and exercises in the early chapters of Durand's treatise not only fail to exhibit what we would consider exemplary tonal syntax, but furthermore fail even to observe the scale-step prescriptions that he subsequently enumerates. Consider, for instance, the figured bass exercises from Durand's chapter on root-position triads shown in

[8] Henri Reber, *Traité d'Harmonie* (Paris: Colombier, 1862), 127–8.

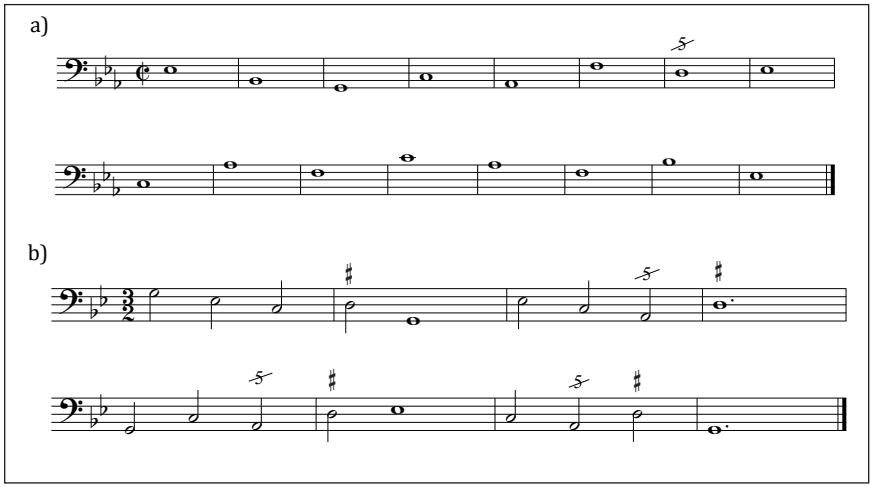
Example 3.[9] These exercises contain repeated use of the diminished triad in root position (customary in French harmony texts), the use of the root-position mediant triad (Example 3a, measure 3), as well as the use of the subdominant instead of an inverted supertonic ascending to a dominant (Example 3b, mm. 1–2).

The particular treatment and placement of these scale-step procedures within the overall organization of Durand's text suggest a great deal about the late nineteenth-century harmony treatise in France, as well as the subject matter these texts aimed to convey. Harmony treatises such as Durand's were not first and foremost works of "tonal theory" in any explicit sense; they were not organized in terms of principles for functional hierarchy, nor were their contents designed to reinforce such principles. Unlike many American music theory texts, for instance, they did not begin with a discussion of tonic and dominant harmony, to be followed

[9] A note regarding figured bass symbols: I have adopted the nineteenth-century convention of placing figured-bass symbols above the bass clef—as opposed to below it—when reproducing examples from primary source materials in order to render them as accurately as possible. When using figured-bass symbols as a heuristic to analyze voice-leading patterns of original examples written for the purposes of this article, I have employed the modern convention of placing figured-bass symbols under the bass clef. In all cases, however, I have used French figured-bass symbols, including those for dominant seventh chords. These include the figures of a slash (/) to indicate diminished intervals and a cross (+) to indicate leading tones. Therefore, for dominant sevenths, the figured-bass symbols for root position and its three inversions are:



The "+" in the root-position symbol indicates the leading tone is the third above the bass, while in second inversion the "+6" indicates that the leading tone is the sixth above the bass, while in third inversion "+4" indicates that it is the fourth. In first inversion, when the leading tone is in the bass, the slash indicates the diminished fifth formed with the chordal seventh above it. In addition, these symbols are used whether or not the dominant seventh occurs naturally, given the key signature, or whether the note in the bass supports a secondary dominant. In other words, accidentals are never used to indicate dominant sevenths in French figured bass. For instance, in the key of G major, an A with a "+6" under it indicates a D7 chord in second inversion, while a C with a "+6" indicates the secondary dominant, F7, in second inversion. In the latter case, no additional accidentals are given to indicate the implied F♮ or E♭.



Example 3. Root-position exercises in Durand's *Traité* (1881)

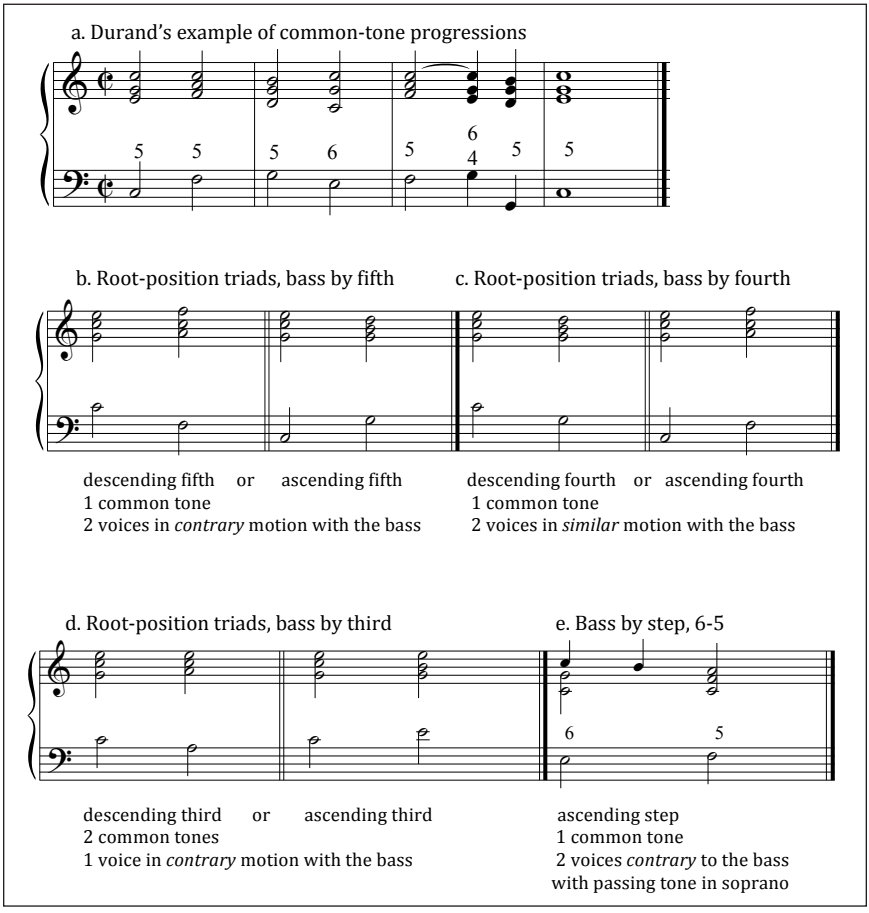
by a discussion of subdominant and supertonic triads, etc. Nor does Durand's approach reflect some scale step equivalent of these procedures. Durand's treatise does not begin with a discussion of scale-degree implications, ascribing a "tonic" implication to scale degrees I and III, and a "dominant" implication to V, VII, II, and IV. Rather, harmony study was largely concerned with the mastery of basic keyboard patterns, and therefore proceeded largely in terms of figured bass. It began not with the study of how to move between tonic and dominant triads, but rather, and as Durand's *Traité* does, with keyboard patterns for moving between root-position chords, or, in terms of figured bass, moving 5 to 5, and then between root-position chords and "chords of the sixth," or 5 to 6 and 6 to 6, then $\frac{6}{4}$ chords, etc. The root-position exercises in Example 3, in other words, were not meant to reinforce tonal principles, but were more simply intended to have students practice various voice-leading techniques as well as master stock keyboard patterns for accompaniments using root-position triads. The student only learned the rule of the octave once having mastered these triadic patterns—patterns needed to realize unfigured basses according to the rule.

In order to get a better idea of how this method worked, let us consider some of the stock keyboard patterns for triadic voice leading that constitute a basic harmonic grammar in Durand's text. As was customary for nineteenth-century harmony treatises, Durand begins with techniques for connecting root-position triads by means of common-tone voice leading. He offers only a single example illustrating these common-tone techniques, shown here

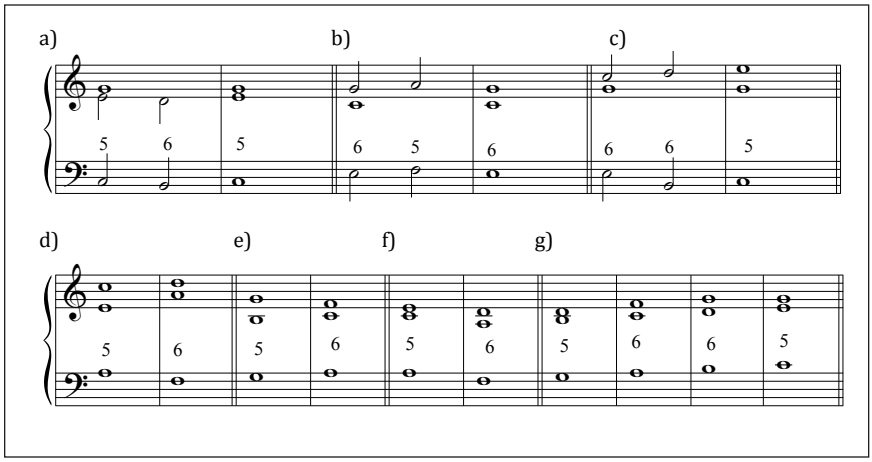
as Example 4a, since, as he notes, he has already treated the topic in his *Traité d'accompagnement au piano*, to which he immediately refers the reader (67, §186). Examples 4b–e summarize the voice-leading principles for these common-tone progressions: bass motion by fifth, ascending or descending, produces one common tone in the upper voices as well as two voices moving contrary to the bass by step; bass motion by fourth produces one common tone and two voices moving by step in similar motion to the bass; and bass motion by third produces two common tones and one voice moving contrary to the bass by step. Stepwise root-position motion, however, produces no common tones and three voices moving contrary to the bass (as in Example 4a, mm. 1–2), in which case it is preferable to realize the first harmony in inversion (Example 4e). To begin their study of harmony, students were expected to master these common-tone patterns at the keyboard, enabling them to realize extended root-position progressions, similar to those in Example 3, with flawless voice leading.

Durand follows this discussion of root-position triads with procedures for triads in first inversion, or *accords de sixte.* Durand's discussion of inversion occurs in two parts. He first treats inverted triads in three-part harmony (50–4, §§138–51), then in four-part harmony (68–70, §§187–200). In contrast to his discussion of root-position harmony, Durand presents inverted triads not in terms of principles for *voice leading,* but largely in terms of principles for *voicing*. He begins by showing two possible voicings for inverted triads: *position directe* with the sixth above the bass (or root) voiced in the soprano; and *position indirecte* with the third above the bass (or chordal fifth) voiced in the soprano (50, §141). Durand does not include a third position with the chordal third placed in the soprano. With regard to four-part harmony, Durand prescribes doubling the soprano at the octave in order to derive the fourth voice, and suggests that one should generally avoid doubling the bass in the soprano except in cases that contrary motion and voice exchange are desired between outer voices (68–9, §§187–91). Durand only discusses voice leading for inverted triads when discussing three-part harmony, enumerating two principles as shown in Example 5: preserve a common tone whenever possible (Examples 5a–c), and, when not, place the sixth in the soprano and use contrary motion with the bass (Examples 5d–e), though direct motion may be used in the case that the sixth is placed in the soprano (Examples 5f–g). Following these two principles, however, Durand's discussion

of inverted triads in four-part harmony devolves into a series of prescriptions regarding when to double the bass, or chordal third, in the soprano; various doubling schemes for the diminished triad; permissible uses of hidden fifths; and ends there. Compared with the basic yet powerful and elegant principles for root-position, common-tone progressions, Durand's treatment of inverted triads seems incomplete in that it does not offer us any concrete strategies for voice-leading. If we extend Durand's voicing, doubling, and voice-leading principles to four-part harmony, however, fleshing out his three-part examples, we can begin to identify additional patterns central to a basic voice-leading grammar. Though perhaps less familiar to us today than the common-tone patterns for



Example 4. Common-tone voice leading for triads

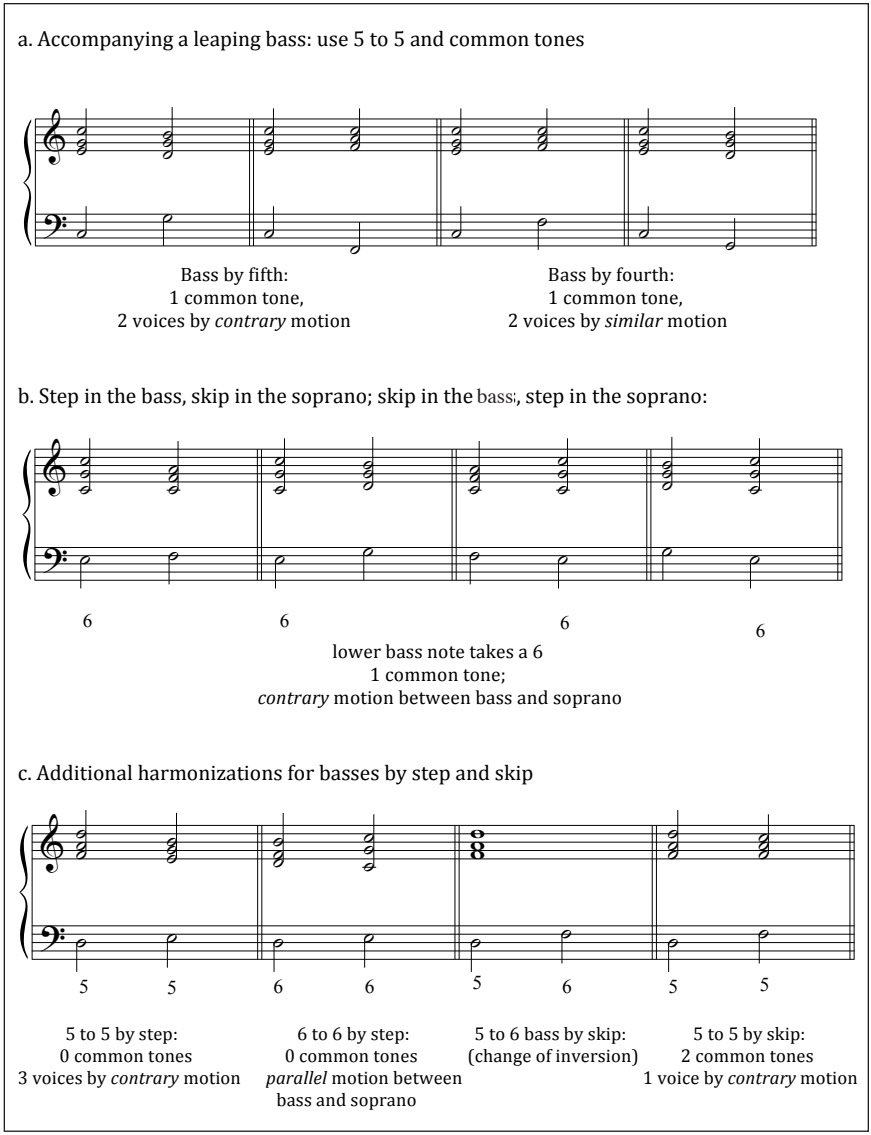


Example 5. Voice leading for inverted triads in three-part harmony using common tones (a, b, c), contrary motion (d, e), and direct motion (f, g)

root-position triads, Durand's various prescriptions for inverted triads conform to a number of common "step and skip" patterns. As shown in Example 6b, when the bass moves by *step*, the lower of the two bass notes takes a 6, making for one common tone and contrary motion by *skip* in the soprano.[10] By contrast, when the bass moves by *skip*, the lower note again takes a 6, resulting in a single common tone and contrary motion by *step* in the soprano. Taken together with the common-tone voice-leading patterns for root-position triads, these step and skip patterns make for a basic voice-leading grammar, outlined in Example 6, that accommodates a bass moving by any interval, whether by step, skip (third), or leap (fourth or fifth).[11]

[10] The first of these patterns in Example 6b has a long history and was used as the basis of a number of common elaborations throughout the eighteenth and nineteenth centuries, including the so-called monte figure as well as what Gjerdingen has dubbed the "Fenaroli." See Robert O. Gerdingen, *Music in the Galant Style* (Oxford: Oxford University Press, 2007), 89–106, and 225–40.

[11] Bass motion by sixth or seventh was still prohibited in Durand's treatise, unless such motion entailed moving between two inversions of the same chord or outlined a dominant seventh.



Example 6. Basic part-writing grammar for accompanying a bass with triads

The harmony student would apply these patterns to figured basses in order to solidify their knowledge of them at the keyboard. As suggested by the organization of Durand's text, the student would master this grammar prior to learning the rule of the octave. In other words, behind every rule of the octave stood a preliminary mastery of basic voice-leading patterns needed to realize triadic accompaniments for any bass line and for smoothly connecting any

two triads. This overall organization points to another fundamental difference between our approach to harmony today and that from centuries past. Namely, for Durand and his students, the study of harmony began with the mastery of a handful of patterns, learned at the keyboard, for how to connect any two triads. As a result, and unlike for our students, voice leading was demystified; the student did not renegotiate voice leading with every new exercise. They learned concrete strategies for moving between any two triads, regardless of scale degree or function, and this skill formed the basis of the discipline.

Lesson 2: Complementary Procedures for 5 and 6 Realizations, and Extending the Basic Grammar to Seventh Chords

The grammar outlined here is hardly comprehensive, particularly in regard to inverted triads. It does not indicate, for instance, how to accompany a bass leaping by fourth using two inverted harmonies, since as mentioned, Durand's discussion of inversion does not focus on voice-leading prescriptions, but rather on doubling strategies. We may, however, recuperate this treatment of inversion in a way that reveals these principles for voicing and doubling to be just as foundational for realizing accompaniments with inverted triads as voice-leading prescriptions are for realizing root-position ones. To do this requires a principle for the procedural complementarity of realizing accompaniments for 5 and 6. We may then use this principle to extend the triadic grammar outlined above to diatonic seventh chords.

In most basic terms, Durand treats root-position triads—or, those that include a fifth above the bass—by prescribing voice leading, while treating the voicing of the chord as incidental. Durand, however, treats chords of the sixth in an opposite or complementary manner, prescribing the voicing of the sixth while, by implication, treating the voice leading as largely incidental. Recall that in moving between root-position triads, the interval by which the bass moves determines the voice-leading pattern used in the upper voices. Bass motion by fifth, for instance, elicits contrary motion with the bass and one common tone in the upper voices. As one moves from one root-position chord to the next, however, the voicing of the chord tones in the upper voices continually changes. For instance, in Durand's illustration of common-tone principles

(Example 4a), the realization begins with the root in the soprano (or in "first position"), the next chord then has the chordal fifth in the soprano ("third position"), then moves to the chordal third in the soprano ("second position").[12] This constant change in voicing is a consequence of the general prohibition on parallel fifths and octaves; the constant change in hand position between those that contain a sixth between soprano and tenor (first and second positions) and that which contains a fifth (third position) ensures, as well as results from, the avoidance of parallel fifths and octaves between upper voices. Crucially, however, one does not need to worry about the details of these changing hand positions or chord voicings. While these facts regarding voicings are descriptively accurate, they are not *practically* or *methodologically salient* when dealing with root-position harmonies; they simply follow from the use of the appropriate voice-leading pattern. In terms of the "logic" of root-position harmonizations, then, we first determine the correct voice leading given the bass motion (contrary, similar, etc.), which in turn results in the specific voicing of the chord.

When dealing with an inverted triad, however—that is, when and moving 5–6 instead of 5–5—Durand's text suggests we take the opposite tack. His approach suggests we first determine the voicing of the chord by placing the root, or chordal fifth, in the soprano and doubling it an octave below (see Example 7a, step 1). Here voicing *is* methodologically salient, receiving priority. Having voiced the soprano, doubled it at the octave, and voiced the bass, we are then left to determine the best voice leading to arrive at this particular voicing. That is, we must determine whether to place the octave doubling between the soprano and alto or between the soprano and tenor, and this determination *has singularly to do* with avoiding a similar fifth or octave in the upper voices, as shown in Example 7a, steps 2 and 3. No other explicit consideration of voice leading need enter into the picture. The correct voice leading simply "comes out in the wash."[13]

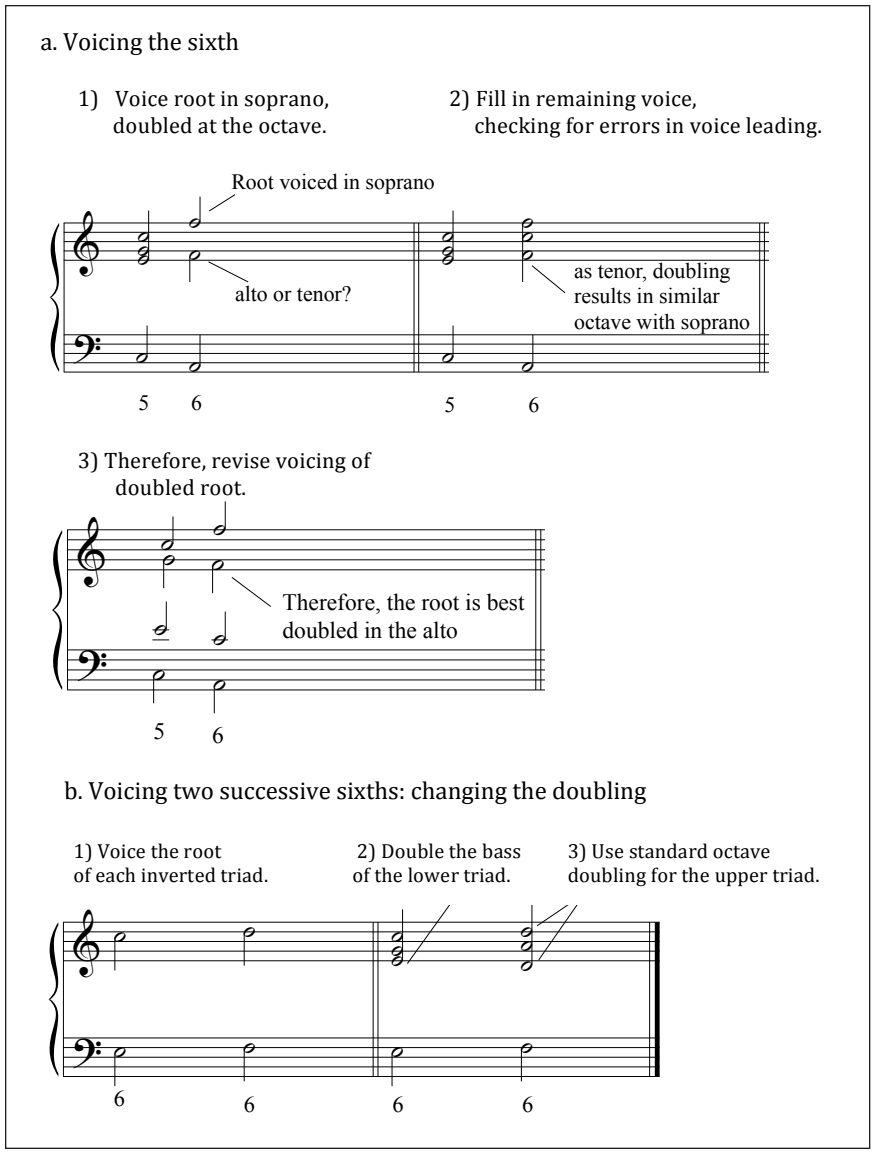
[12] In accompaniment treatises, the term *position* refers to the arrangement of the upper voices. *First position* refers to the voicing of the chordal root in the soprano, often in close position; *second position* to close position with the chordal third in the soprano; and *third position* to close position with the chordal fifth in the soprano.

[13] These matters of voicing, rather than voice leading, receive similar methodological priority when moving 6–6, or between successive inverted triads. As shown in Example 7b, when moving between successive 6's, especially over a bass by step, the student begins by voicing the sixth of both chords in the soprano, producing parallel

The procedural complementarity of 5 and 6, then, refers to the logic for realizing both sorts of accompaniments, and those features of the realization process that we take as methodologically salient. When realizing a root-position accompaniment, we voice lead first, from which the chord voicing follows. By contrast, when realizing an accompaniment with inverted triads, we take voicing as methodologically salient, and first voice the chord's root in the soprano, from which the voice leading follows. By extension, we may use this principle of complementarity to adapt the basic grammar above to accompaniments using seventh chords. It is especially helpful in dealing with the issue of preparing "non-essential" dissonances of the major and minor seventh, as we may, in general, treat the figure 7 as we do 5—that is, with prescribed voice leading—and those of $\frac{6}{5}$ and $\frac{6}{4}_{3}$ as we do 6—with prescribed voicing. In other words, harmonies are treated as either a "5" or a "6," as "root position" or "inverted," whether they are triads or seventh chords.

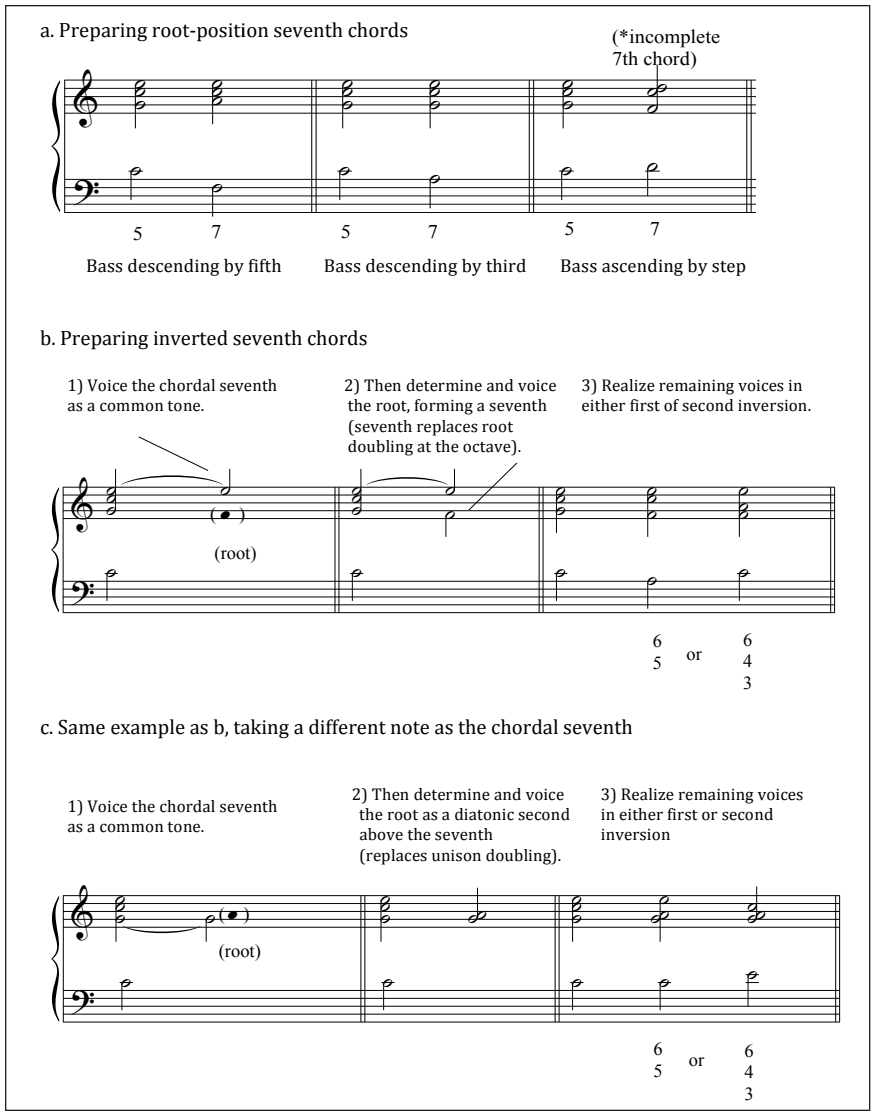
Consider that in root position, the voice leading for preparing a non-essential seventh is effectively prescribed, determined by the interval by which the bass moves. As shown in Example 8, in order to prepare the seventh when moving 5–7, the bass may descend by fifth, descend by third, or ascend by step. Each of these three results in a common-tone voice-leading pattern that resembles those for triads when moving by the corresponding interval in the bass. Moving 5–7 over a bass by fifth, for instance, resembles the pattern for moving 5–5 over a bass by fifth. The root-position pattern of one common tone and two voices moving contrary to the bass by step becomes, when moving 5–7, two common tones with one voice moving contrary to the bass by step. The second, additional common tone appears in the part that would have moved by contrary motion to the octave above the bass if a triad rather than a seventh chord had been used.

motion with the bass. After voicing the soprano, the student then turns to the question of doubling, voicing the inner parts according to another well-know principle for inverted triads. Namely, successive 6s require a change in doubling in order to avoid parallel octaves, and this is most often, and easily, achieved by doubling the bass of the lower of the two chords and the soprano in the higher of the two. In any case, the parallel voice leading, again, *results* from the primary concern for chord voicing.



Example 7. The complementarity of 5 and 6; realizing sixths via prescriptive voicing

Conversely, when preparing an inverted seventh chord (i.e., a seventh chord that contains a sixth), we may treat the voicing as prescribed, in the manner of an inverted triad, while treating the voice leading as incidental. The procedure begins by voicing the chordal root and doubling it at the octave or unison. Although here, again, in the case of a seventh chord, the seventh replaces the octave root doubling. To prepare an inverted seventh chord we therefore begin by voicing the seventh—which substitutes for one of the doubled chord roots of the inverted triad—by keeping the soprano in place and then voicing the chord root in the alto or tenor to form a seventh below it (see Example 8a). We then voice the remaining parts to complete either a $\frac{6}{5}_{3}$ or $\frac{6}{4}_{3}$ chord. More simply, we can prepare the inverted seventh chord by voicing a second in two adjacent upper voices (Examples 8b–c). Here, the second replaces what would have otherwise been a unison doubling of an inverted triad, just as the seventh replaced what would have otherwise been an octave doubling. Having prepared the second, we are then free to voice the remaining notes of the seventh chord however we choose, forming either a $\frac{6}{5}_{3}$ or a $\frac{6}{4}_{3}$, which results in the de facto determination of correct voice leading. Approaching inverted seventh chords by means of these procedures therefore *completely eliminates any and all concerns for voice leading*, as voicing is the only salient matter.



Example 8. Complementary procedures for voice leading root-position seventh chords and voicing inverted seventh chords

Lesson 3: The Constancy of Triadic Voice Leading Under Chromatic Alteration

In addition to forming the foundation for dissonant harmony, the basic grammar outlined in Example 6 also serves as the foundation for chromatic harmony pedagogy in Durand's 1881 treatise. In considering some of Durand's basic procedures for chromaticism, it is important to note that these techniques represent a simplification, rather than an elaboration, of chromatic techniques from earlier in the nineteenth century. Furthermore, these techniques had little to do with the development of a more explicit and complex theory of harmonic tendency or function, but rather pertained to a simplification of chromatic procedures associated with the rule of the octave. As noted earlier, Durand appeals to only one formulation of the rule, whereas his predecessors relied on numerous and more elaborate scalar patterns. This simplification, both in number and in kind, made chromatic harmony more practicable by century's end, resulting in the complex chromatic idiom reflected in works such as Fauré's *La Bonne Chanson*. To illustrate these changes, I will therefore begin not with a consideration of chromatic harmony pedagogy as it appeared fully developed in the late nineteenth century, nor with Fauré's mature manipulation of it. Rather, I will begin by examining a more familiar—i.e., "functional"—chromatic idiom, namely that of the late classical style circa 1800, by briefly considering the writings of Alexandre Choron. By comparing Choron's late classical and Italianate approach (which was thoroughly grounded in the rule of the octave and thereby easily rendered in terms of a theory of harmonic function) with those of Durand and Fauré (which were not), we may see how chromatic harmony pedagogy, while evolving out of earlier "functional" techniques, moved not toward but rather away from such an explicit and applied theory of harmonic tendency for practical purposes.

Known for his transmission of a number of Italian partimento sources to France, Choron's approach to chromaticism, such as the one he takes in his *Principes de composition des écoles d'Italie*, acts largely as an extension of techniques associated with the rule of the octave.[14] Choron's approach relies on a conception of the octave species as the sum of two tetrachords. For instance, after Choron's

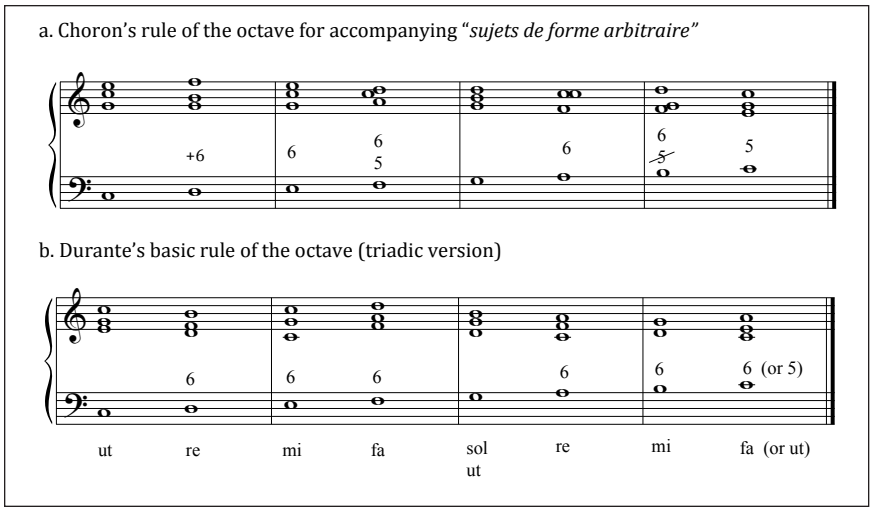
[14] Alexandre-Étienne Choron, *Principes de composition des écoles d'Italie* (Paris: Le Duc, 1808). All subsequent parenthetical references will be to this edition.

exposition of basic harmonic procedures, including a number of the same voice-leading and figured-bass patterns outlined above, he then uses these patterns to harmonize a series of major and minor scales, both ascending and descending, with increasing complexity.[15] Choron describes the first of these harmonizations, shown here as Example 9a, as appropriate for accompanying any generic melody or "*sujets de forme arbitraire*" (Choron 89). If we eliminate the seventh chords from this example, we see a basic pattern emerge of root-position and inverted triads—i.e., of 5s and 6s—that recalls the most basic form of the rule of the octave as conceived by a number of eighteenth-century Italian pedagogues. Compare, for instance, Choron's realization with Durante's basic rule of the octave given here as Example 9b.[16] The underlying pattern of 5–6–6–6 repeats over the eight notes of the octave, harmonizing both a lower tonic tetrachord, and an upper dominant tetrachord. The reason for this parallel harmonization of lower and upper tetrachords is clear: many Italian schools of the day relied on a tetrachordal solfège, *re–mi–fa–sol*, with the two tetrachords conjoining on *sol–ut* as in Example 9b. In the most basic patterns of accompaniment taught to beginning students, all diatonic semitones, or instances of *mi-fa* in the vernacular *solfeggio*, were realized with *mi* providing the support for an inverted triad, and as such, scale degrees III and VII received the same basic harmonization.[17]

[15] As Sanguinetti describes, a number of Italian masters, including Nicola Sala—from whose works Choron borrows widely in his *Principes*—taught a form of counterpoint where scales were used instead of a cantus firmus, resulting in a hybrid pedagogy that blended species approaches with the rule of the octave. See Giorgio Sanguinetti, *The Art of Partimento History, Theory and Practice* (Oxford: Oxford University Press, 2012), 43, 74–5.

[16] For an accessible discussion of the basic *regole* of both Durante and Fenaroli see Robert O. Gjerdingen, "The Monuments of Partimenti," http://faculty-web.at.northwestern.edu/music/gjerdingen/partimenti/index.htm.

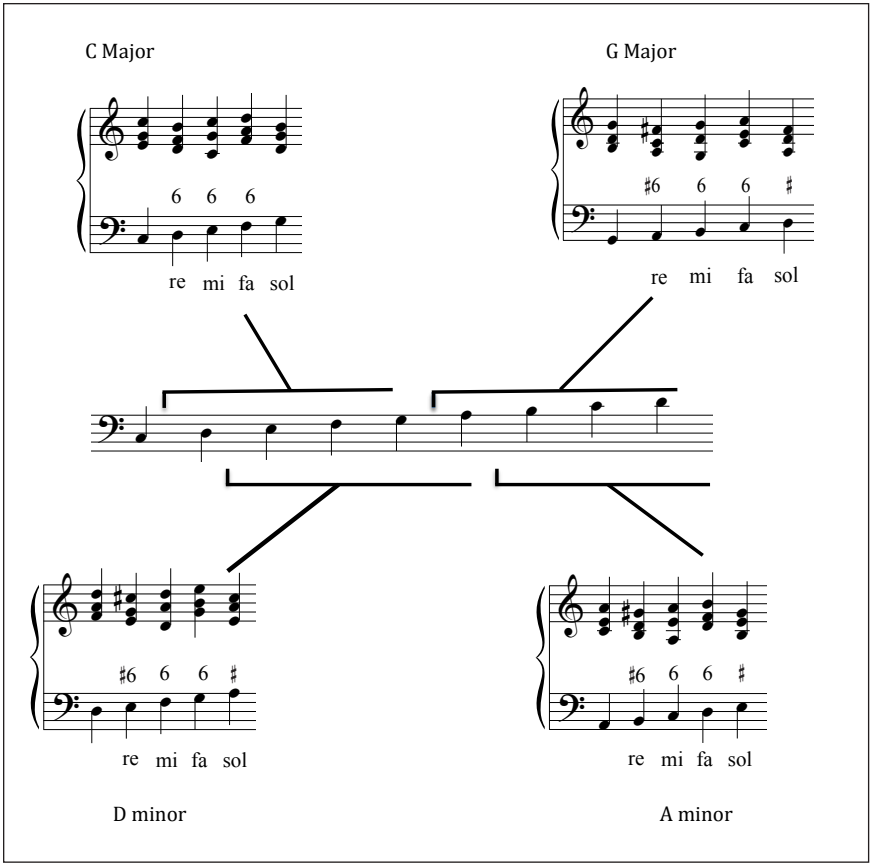
[17] Gjerdingen, *Music in the Galant Style*, 34–6. See also Durante's "*MI* rule" in Gjerdingen's *Monuments.*



Example 9. Two examples of the rule of the octave

Through an extensive series of realizations, Choron then proceeds to show how to embellish this basic tetrachordal pattern through the addition of sevenths and other dissonances. For instance, the addition of a seventh chord or a $\frac{6}{4}$ over a stepwise bass passing through *re* was the first and most common form of elaboration. In the *Principes*, however, these elaborations are also chromatic in nature, with this four-note pattern acting as a template for tetrachordal mutation. That is, for Choron, the 6–6–6–5 pattern serves as the basis for harmonizing the various major and minor tetrachords found in any scale, effecting modulations to closely related keys (see Example 10). The primary chromatic alterations required to mutate tetrachords include a raised sixth above *re* as well as a raised third above *sol*. For instance, in C major, the 6–6–6–5/*re–mi–fa–sol* pattern may be applied to the G-major tetrachord, the A-minor tetrachord, and the D-minor tetrachord by changing the 6–6–6–5 pattern to ♯6–6–6–♯. Applying these simple alterations to the various major and minor tetrachords contained in any scale meant that one could easily modulate between four different keys without chromatically altering the bass line.

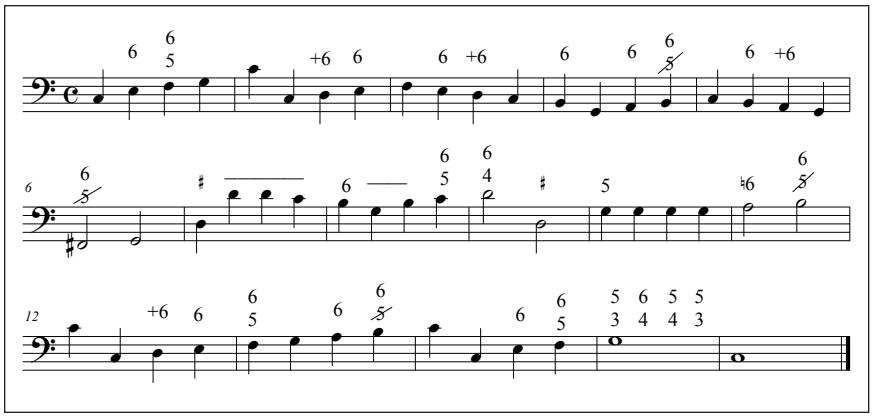
We can see this technique at work in the first partimento exercises found in Choron's *Principes*, exercises that he borrows from Fenaroli (see Example 11). The first three measures outline the tonic tetrachord, while the next eight measures outline the dominant tetrachord, with the C4 on the first beat of m. 12, taking a 5 instead



Example 10. Rule of the octave with chromatic elaboration of major and minor tetrachords.

of a 6, indicating the move back to the tonic tetrachord. The G tetrachord, however, mutates, acting both as a tonic tetrachord in G major (mm. 8–9) as indicated by the figures 6–$\frac{6}{5}$–$\frac{6}{4}$–♯ over B–C–D, as well as a dominant tetrachord in C (mm. 10–12) as indicated by the symbol for the first-inversion dominant over the B in m. 11. Similarly, if taken as an unfigured bass, we could realize the scalar segment in m. 11 as A minor, and the segment in mm. 12–13 as D minor via a similar process of tetrachordal mutation.

We can immediately observe a number of differences between this approach to chromaticism and more familiar ones based on notions of harmonic tendency and syntax.



Example 11. Partimento No. 1 from Choron's *Principes de composition*

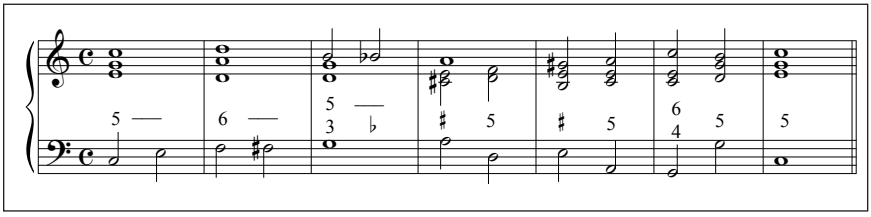
Choron's approach does not require that we invoke concepts such as pivot chords, chord borrowing, or modal mixture, for example, at least not explicitly. Rather, by using the four-note *solfeggio*, we may devise a tetrachordal interpretation of any bass line—including an unfigured bass—and realize it accordingly. Furthermore, the realizations in which the tetrachordal interpretation results, whether diatonic or chromatic, will always be functional, as the prescribed sonorities always produce functional patterns (i.e., *re* by step will always be realized as a linear dominant, *mi* as supporting an inverted tonic triad, etc.). In other words, by taking Choron's approach, one does not have to bear in mind prescriptions for harmonic tendency at every turn, as the harmonic functions are built into the 6–6–6–5 realization pattern. Thus, and as a historical matter, this technique resulted in functional, tonal patterns, though a concept of harmonic function was not necessary to compose them.

This approach, however, relies on another basic and unspoken principle, one that relates directly to the study of the voice-leading patterns addressed above: namely, the use of chromaticism, with few notable exceptions, does not alter the underlying triadic voice-leading patterns of the basic grammar. The chromatic alteration of the basic 6–6 pattern to ♯6–6, or that of 5–5 over a bass by fifth to ♯–5, does not change the voice leading of the upper voices.[18] This

[18] The most common exception to this principle has to do with raised notes, or when a note is turned into a leading tone. Such an alteration constrains the voice leading by requiring that the raised note subsequently move by step, not leap, and most often by ascending step. Nevertheless, such an alteration does not change any of the applicable voice-leading patterns: a bass rising by fourth will cause all the upper

principle of the constancy of triadic voice leading under chromatic alteration, unspoken in Choron's writings, becomes particularly and explicitly important for chromatic harmony pedagogy during the second half of the century, including in the approach found in Durand's *Traité,* to which I will now turn.

Durand treats chromaticism as a topic unto itself rather than as an extension of procedures associated with the rule of the octave as seen in Choron. Following the first nine chapters of his treatise on diatonic harmony, the second section of the *Traité* includes ten chapters on "Modulatory and Non-Modulatory Chromatic Harmony." For the purposes here, I would like to focus on Durand's treatment of what he refers to as *modulations passagères,* or roughly, "tonicization." Durand begins his discussion of modulations passagères with a brief introductory chapter centered on the simple observation that many chromatic passages in music preserve their tonality despite containing a number of chromatically altered harmonies (section II, chapter 6). Durand argues that these modulations, such as those in Example 12, are more "apparent" than "real" and borrow their harmonies from chromatic scales (155, §§450-51). He further explains that, while these harmonies may appear to be borrowed from other keys, and often quite distant keys, they nevertheless do not rely on any new sorts of chords or "aggregations" (156, §455). The harmonies involved consist simply of triads and dominant seventh chords.

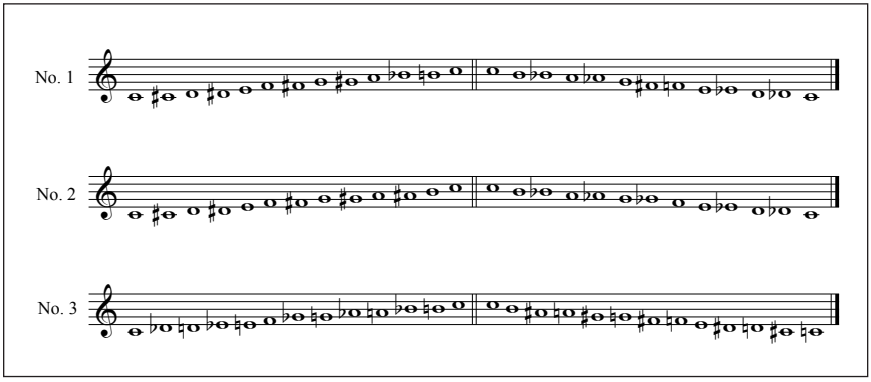


Example 12. Modulations passagères in Durand

The following chapter (chapter 7) proceeds to discuss the composition of modulations passagères through the use of what Durand terms "simple," "double," or "triple" chromatic alterations of triads, that is, by altering one, two, or three notes of a triad respectively (151, §452). To illustrate this, Durand offers three pairs of ascending and descending chromatic scales (see Example 13).

voices to move via similar motion (and thus resolve the chromatically inflected leading tone), while, similarly, a bass descending by fifth will push the upper voices in contrary motion.

He suggests that the first of these three pairs is the most "tonal," and can be harmonized by means of simple chromatic alterations, effecting passing modulations only to closely related keys. The second and third pairs of chromatic scales require double or triple chromatic alterations, bringing about passing modulations to more distant keys (157–8, §§459–61).



Example 13. Chromatic scale types in Durand

With regard to the first chromatic scale and the notion that it is the most tonal, requiring only simple chromatic alterations, Durand offers four sample progressions shown here as Examples 14a–d. In 14a and b, Durand harmonizes the first pair of his chromatic scale types—voiced in the soprano, both ascending and descending—through the simple alteration of the chordal thirds of the major and minor diatonic triads. In 14a, Durand raises the chordal thirds of the minor diatonic triads in order to produce major triads, resulting in the ascending chromatic scale, while in 14b, he lowers the chordal thirds of the major diatonic triads to produce minor triads and a descending chromatic scale. Durand's next pair of examples, here as Examples 14c–d, harmonize the same ascending and descending chromatic scale type by again altering the chordal thirds of the major and minor diatonic triads. This time, however, Durand uses inverted triads so that the chromatically altered chordal thirds, and resulting chromatic scales, appear in the bass.

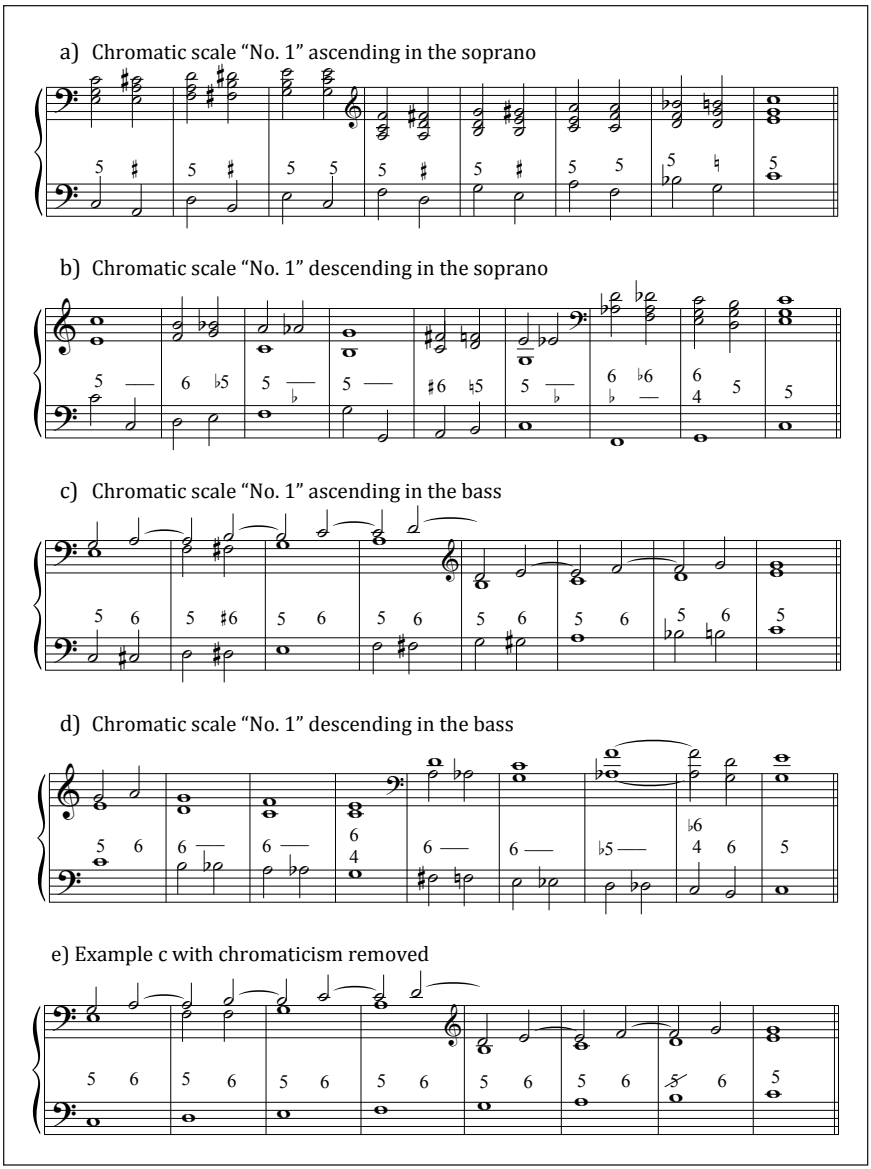
Following these four examples, Durand then makes the simple, but powerful, observation, "It is important to note that…one could remove all the chromatic alterations [from these examples], which would have the effect of rendering two diatonic scales…and destroy all appearance of modulation" (158, §463). Durand illustrates this,

rewriting Examples 14c and d without any chromatically altered tones. The rewritten Example 14c is given here as 14e. Durand's observation is important for a number of reasons, perhaps most significantly because it suggests the corollary that the introduction of chromaticism does not affect the basic voice-leading patterns that the student has learned with regard to triads. In Examples 14a and 14b, Durand accommodates all the root-position motion with basic common-tone progressions; if we removed the chromaticism, the progression would constitute a standard root-position sequence. Similarly the chromatically altered inverted triads in Example 14c rely on the sort of parallel voice leading characteristic of inverted diatonic triads.

Durand concludes his discussion of simple chromaticism by offering a few added prescriptions: avoid false relations, avoid doubling the chromatically altered tone, and chromatically raised notes should continue to ascend by diatonic semitone, while lowered ones should continue to descend by diatonic semitone (161, §§470-2). As these examples suggest, for Durand, this last prescription means following a chromatic alteration with a root-position, common-tone progression by descending fifth/ascending fourth in order to push a chromatically raised note upward, or by ascending fifth/ descending fourth in order to pull a chromatically lowered note downward (this will be important when returning to Fauré's "Donc, ce sera").

Durand's discussion of chromaticism provides a significant contrast to Choron's. By the late nineteenth century, the tetrachordal conception of the octave had been replaced by an understanding of the octave as a single, unbroken species, and a resulting method that thereby applied chromaticism equally to all scale degrees. For instance, Choron's approach requires that we interpret each scale degree in terms of some major or minor tetrachord, whether that tetrachord is stated in part or in whole. Each scale step is then realized as one of only four basic figures: 5, 6, ♯6, or ♯. Durand's approach, by contrast, only requires that, at a minimum, the chromatic alteration result in another diatonic triad, meaning that we may alter any scale degree or the harmony it supports, effectively removing the tetrachordal (read: "scale-step") requirements for chromaticism. Durand's text also makes explicit an important principle that was implicit in treatises from earlier in the century; namely, chromatic alterations of triads do not affect the underlying voice leading of a triadic progression.[19] This is a powerful principle when applied to the basic voice-leading grammar outlined above as it may generate a number of rich chromatic progressions and furthermore do so without appealing to an explicit theory of harmonic tendency or function.

[19] It is interesting to note the emergence of this principle regarding the constancy of voice leading under chromatic alteration as an explicit part of harmony study. In works such as Choron's, such a principle was never written down, owing, I would suggest, to the centrality of the rule of the octave, and moreover to the tetrachordal conception of the octave in harmony pedagogy around 1800. For his part, writing in 1862, Reber does mention the principle explicitly, although only in passing and in a note (see Reber's *Traité,* 56). Lastly, in Durand, writing a generation after Reber, we see the principle explicitly articulated and illustrated with examples. Over the course of the century, then, this principle moved from its unspoken status, to marginalia, to the body of the text.



Example 14. Harmonized chromatic scale-types in Durand

Fauré's "Donc, ce sera" Reconsidered

The basic grammar outlined above, its extension to dissonant harmony, and the approaches to chromaticism taken by both Choron and Durand may inform our understanding of Fauré's "Donc, ce sera" in numerous ways. In accordance with the practical

techniques discussed here, we may begin by constructing a voice-leading reduction that, in the manner of Durand, removes all chromatic alterations and modulations passagères. A reduction of mm. 2–3 and 10-11, provided in Example 15, shows scalar segments in the bass serve as an important compositional device, structuring the overall voice leading. This suggests the continued relevance of scalar and octave-derived pedagogy late into the nineteenth century, though as we will see, one that reflects a more liberal understanding of chromaticism in the manner of Durand. With the chromaticism removed, we can also observe a number of dissonant elaborations of grammatical, triadic voice-leading patterns. For instance, m. 3 contains three root-position chords with the bass ascending by third then by step, 5–7–5, in terms of figured bass. The intervening seventh chord replaces an implied 5, such that the unprepared seventh, B♭ (tenor, m. 3, beat 2), replaces what would have been the octave C in the tenor had the harmonies progressed 5–5 over a bass by ascending third. In addition, the tenor ends this measure where it otherwise would have, on A, had the middle chord of the measure been a triad instead of a seventh chord. Similarly, the D in the soprano on beat 4 of m. 2 is a "wrong note." If we look closely, the figured bass resembles a parallel 6–6 progression, though with the second 6 replaced with a 7. The 6–6 parallel progression would have supported F–E in the soprano. Here, however, the passing E is omitted so that the melody descends directly by third to D. In other words, the implied underlying progression here is 6–6–5, with the 6–5 occurring over a sustained bass.

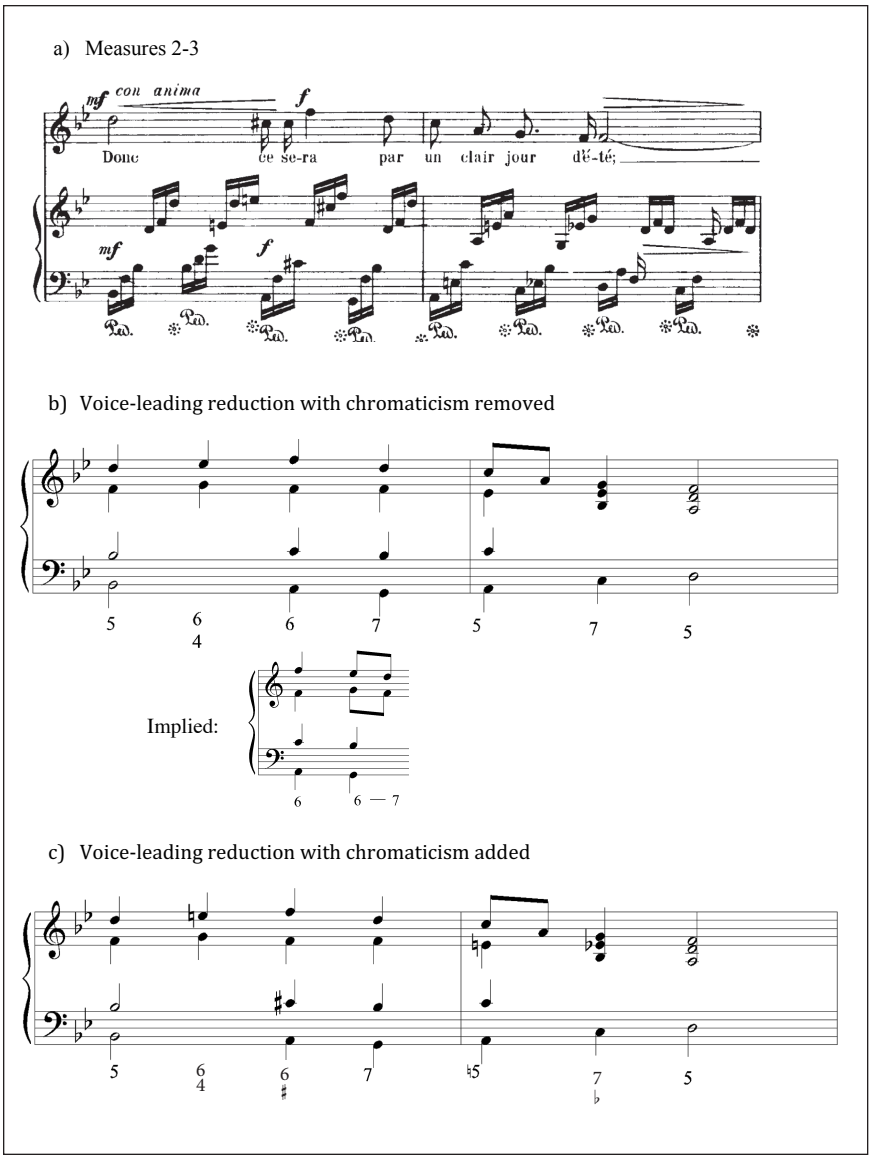
Looking more closely at Faure's precise choice of diatonic, vertical sonorities (i.e., 5 or 6) also makes for a number of interesting comparisons with the techniques discussed above, and in particular where he departs from them. These comparisons get at key elements that contribute to Faure's distinct, mature style, and its broadly "modal" sound.

For instance, Fauré relies extensively on scalar bass lines. Compared with a more classical approach like Choron's, rather than harmonizing a passing note in the bass with the customary 5–6–6 pattern (that is, via an inverted harmony), Fauré harmonizes passing tones with root-position sonorities. In addition, these passing notes in the bass rarely connect two inversions of the same harmony, but

rather tend more frequently to pass between different harmonies.[20] While Fauré's technique is, therefore, still grounded in scale-based harmonization practice, he approaches the octave as a single, seven-note species similar to Durand, where each step may support either a root-position or inverted sonority.

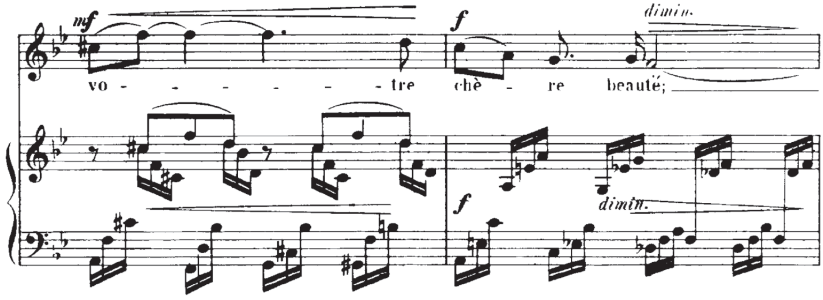
Faure's chromatic elaborations of these patterns exhibit a similarly interesting twist. The numerous modulations passagères easily graft onto the underlying voice leading, reflecting the basic notion that chromaticism does not affect underlying diatonic voice leading. If we look carefully, however, we find that Fauré's chromaticism often reverses one of Durand's principles: notably, chromatically raised tones, instead of continuing to ascend by semitone, usually descend by diatonic second. Similarly, lowered tones, instead of continuing their projected chromatic slide downward, often ascend by diatonic second. The C♯ in measures 3 and 10, instead of ascending to D, descends to B♭. While the chromaticism does not alter the voice leading of the original diatonic framework, it does, however, contravene our—though not necessarily Fauré's—notions of tonal harmonic function or tendency. Raised notes, rather than acting as leading tones of "secondary dominants," freely descend, while lowered tones, instead of acting as chordal sevenths of either secondary dominants or fully-diminished seventh chords, freely ascend. Furthermore, and as this example shows, Fauré uses this chromatic reversal tactic even when it creates an augmented second (C♯–B♭). In other words, Fauré treats voice leading as an exclusively diatonic matter, adhering, in the extreme, to a principle of diatonic voice-leading constancy under chromatic alteration. Any C can move to any B because it is a diatonic step (i.e., in terms of letter name).

[20] The reliance on root-position sonorities, and furthermore the use of passing notes in the bass as support for root-position sonorities—rather than, say, inverted dominant sevenths—was characteristic of the teachings of Fauré's own teacher, Louis Niedermeyer. Following the later teachings of Choron, Niedermeyer sought to develop a method for the harmonization and accompaniment of religious music, including Gregorian chant, that he outlined in his *Traité théorique et pratique de l'accompagnement de plain-chant* (with Joseph d'Ortigue (Paris: E. Repos, 1857)). The revived interest in church modes and the harmonization of chant further slowed the development of an explicit and pedagogical tonal theory in France, while at the same time—and as we can see from the work of Fauré—provided an important foil to the Conservatory model.

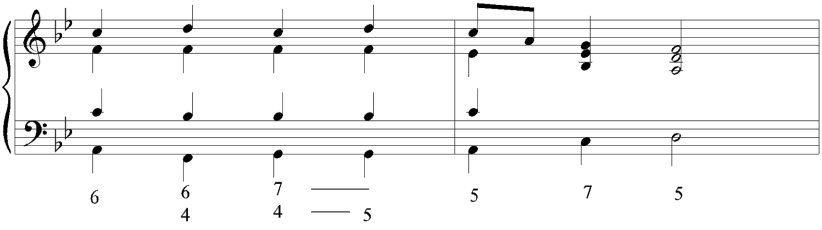


Example 15. Voice-leading analysis of Fauré, "Donc, ce sera par un clair jour d'été"

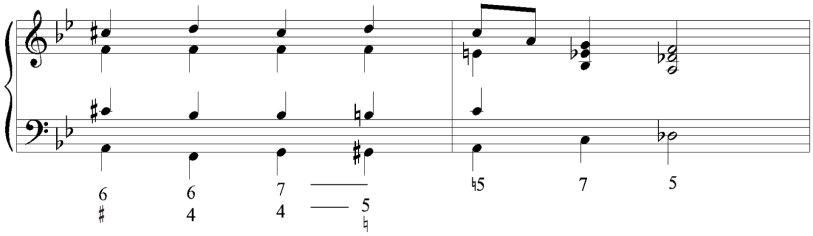
d) measures 10-11



e) Voice-leading reduction with chromaticism removed



f) Voice-leading reduction with chromaticism added



Example 15. *(continued)* Voice-leading analysis of Fauré, "Donc, ce sera par un clair jour d'été"

Conclusion: Leçons Learned

The techniques and methods described here outline the broadest contours of practical harmony pedagogy in late nineteenth-century France, and suggest the numerous ways this discipline differed from our own. As I have shown throughout, the most prominent differences pertain to our reliance on an applied theory of harmonic tendency and the almost complete absence of such an approach from this particular tradition. There are numerous lessons we can take from this, both in terms of concrete techniques to use in the classroom, as well as lessons for how to understand the broad relationship between our descriptive theories of harmonic function and our practical methods, and our efforts at integrating the two. Pedagogically, three of the techniques discussed here, including some version of a voice-leading grammar, a simplified version of the rule of the octave, and a voice-leading approach to chromaticism, could greatly enhance our current approaches. To conclude I would briefly like to share some basic exercises that I have used with students that rely on these techniques.

In developing and reinforcing a basic voice-leading grammar for our students, some version of the rule of the octave—either its tetrachordal version such as that found in Choron or its presentation as an unbroken octave species such as in Durand—could greatly improve student fluency in writing basic functional progressions and simple modulations between closely related keys. I am thinking here particularly in terms of a first- or second-semester music theory class. As a mnemonic, the rule offers specific cognitive advantages in that it enables students to compose original bass lines freely and produce functional harmonizations of them without having to bear in mind explicit prescriptions for harmonic tendency or syntax at every turn. That is, by using the rule they would not have to engage in the constant guessing game of "which chord comes next" since functionality is built into the tetrachordal 6–6–6–5/*re–mi–fa–sol* realization, even when modulating. This built-in functionality is something that is not widely understood about the rule of the octave, and it makes functional translations of the rule into various functional schemes—such as Gauldin's functional translation of Heinichin—largely unnecessary.[21] To demonstrate the rule of the octave's "built-in" functionality, I often use a number of simple exercise for both

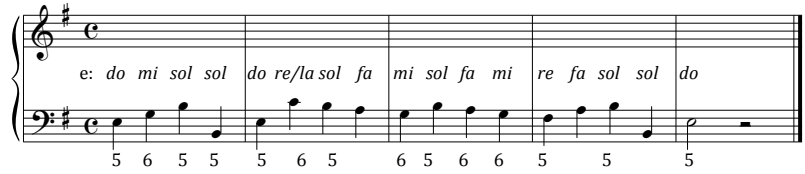
[21] When it comes to recent music theoretical interpretations of the rule, many theorists crucially omit the rule's provisions for dealing with leaping basses, yet this is central to how the rule operates and generates what we would term "functional" progressions.

beginning and intermediate students. These exercises help students realize functional harmonizations for unfigured basses, as well as introduce them to techniques for realizing simple modulations. For beginning students, I use a number of bass lines, such as the one shown in Example 16, adapted from partimenti by Choron, Sala, Fenaroli, and others. Before they begin, I remind students of the basic *re–mi–fa–sol*/6–6–6–5 pattern for tonic and dominant tetrachords, that skips usually suggest a change in inversion (particularly when ascending), and that *re* supports a root-position harmony when leaping and an inverted harmony when moving by step. Students then begin the exercise by interpreting the bass line in terms of solfège syllables and indicate which bass notes should support a root-position or inverted harmony by using a 5 or 6 (Example 16, step 1). Then, using patterns they have learned from the basic grammar, a beginning student will be expected to realize the upper voices (step 2). Intermediate and more advanced students continue by adding dominant sevenths and other dissonances as appropriate, as shown in step 3, indicating these additions in the figured bass (here, $\frac{6}{4}$ chords have been added along with ii^7 chords).

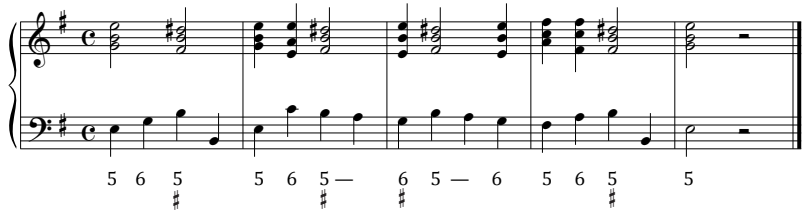
Once students have mastered this basic procedure, they can then try realizing harmonizations that modulate to closely related keys such as in steps 4a and b. To do this, students begin with a tetrachordal/solfège interpretation of the bass line as they did in Step 1, though with a crucial twist. Namely, unlike step 1, step 4 requires students to interpret the bass line in terms of the other available major or minor tetrachords, adding the corresponding, and chromatically modified, figured bass symbols (such as those from Example 10). For instance, the unfigured bass here can be interpreted in terms of fragments from a number of major or minor tetrachords, including G major, F♯ minor, and D major. In step 4b, for instance, each descending step in mm. 2–3 is interpreted as *fa–mi* (major) or *fa–me* (minor) and realized as a $\frac{4+}{2}$ to 6 progression. Taking this approach, students are able to modulate to closely related keys without the complicated, function-driven apparatus of pivot chords, borrowed chords, and the like.

Along these lines, the simple principle of the constancy of triadic voice-leading patterns under chromatic alteration offers a vast resource for dealing with advanced chromaticism. Taking an approach in which students color and re-color simple voice-leading patterns using various chromatic alterations—similar to what has been shown with respect to Fauré—may go a long way

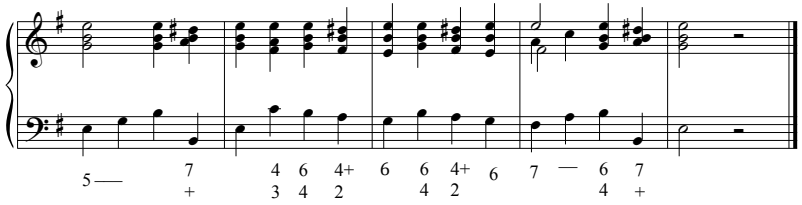
Step 1: Interpret bass line using the rule of the octave and indicate root-position and inverted sonorities (5 or 6).



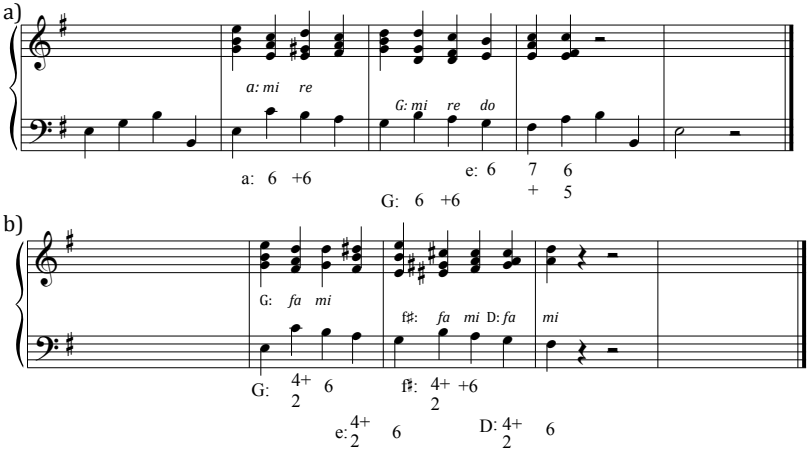
Step 2: Realize upper voices according to the basic grammar.



Step 3: Add dominant seventh chords and other dissonances.



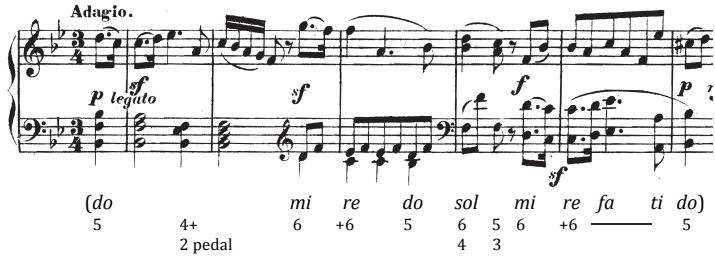
Step 4: Interpret bass line in terms of tetrachords from other major and minor keys and realize accordingly.



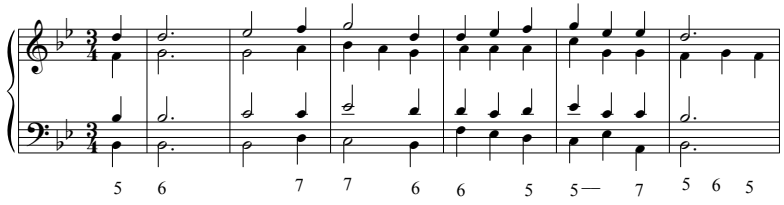
Example 16. Realizing an unfigured bass with tonicizations/modulations to closely related keys

in taking the fear out of dealing with chromaticism, as well as encourage compositional creativity when dealing with what could otherwise be a daunting subject matter. A simple two-step exercise may accustom students to producing this sort of chromaticism in a creative way, yet still one that relies on solid voice-leading techniques.

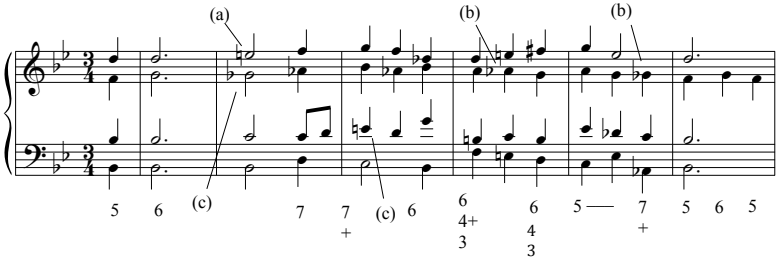
Step 1. Analyze bass line of Clementi, Op. 24, No. 2, mvt ii.



Step 2: Replace root-position sonorities with inverted sonorities, inverted sonorities with root-position sonorities (5-6 chord substitution), and then realize.



Step 3: Add unprepared chromaticism (a); prepared chromaticism (b); and chromatic reversals (c).



Example 17. Recomposing Clementi to include modulations passagère in the style of Fauré

The exercise shown in Example 17 relies on two sorts of "reversal techiniques": reversal of when to use root-position or inverted harmonies (or, a simple 5–6 chord substitution in terms of figured

bass), and reversal of chromatic voice leading (lowered tones continue to ascend by whole step while raised tones descend by whole step). The exercise begins by having students analyze a bass line from a Clementi piano sonata in terms of a standard rule of the octave (see Example 17, step 1). Then, having identified the standard, tetrachordal harmonization patterns, students replace every 5 (or 7) with a 6, and every 6 (or $\frac{6}{5}$, $\frac{6}{4}$, etc.) with a 5 or 7 (step 2). Lastly, students are asked to add chromaticism two different ways. They are first asked to raise and lower tones in individual parts where the line ascends or descends by step, respectively. They may add unprepared chromaticism (as indicated at part "a," step 3) or may use prepared chromaticism (as indicated at part "b," step 3). Lastly they are asked to reverse these chromatic alterations and add lowered tones to ascending lines and raised tones to descending lines (as indicated at part "c," step 3).

Despite the simplicity of the steps involved, this sort of exercise is more difficult than it may at first appear—though still, arguably, a lot simpler than trying to conceive the sort of resulting progression by using notions of harmonic function. There are plenty of opportunities for students to go wrong and not every harmonization will "sound good." Students must ultimately rely on their ear as well as their familiarity with the style in question in order to refine their realizations. For instance, having drafted a few different harmonizations, students will begin to hear that harmonies involving a diminished fifth or augmented sonorities constituted by a melodic passing tone sound characteristic of the style, and consequently may begin to look for opportunities to use half-diminished seventh chords and augmented triads. As such, it is important that students develop techniques for drafting in order to succeed at this sort of exercise. The key, in any case, is that students learn to *begin* by realizing a solid, diatonic voice-leading structure, and then continue by grafting chromaticism onto it. In other words, unlike our function-driven approaches, chromaticism does not figure into the exercise *from the start* nor in a left-to-right manner. Rather, chromaticism is a form of embellishment, and is only addressed once the diatonic voice-leading structure is in place.

In addition to the actual techniques outlined here, however, this discussion points to broader issues surrounding the logic of practical harmony pedagogy, particularly as it pertains to what has been referred to here as an applied theory of harmonic function.

Our reliance on a theory of harmonic tendency has become so foundational in our pedagogy that syntax and function appear to many of us—and particularly to our students—as being the actual content and stuff of composing; writing in a classical style, for us, is *from the start* about what chord should follow some previous chord. Students learn to generate progressions in a largely left-to-right manner. As a historical matter, however, composing was never about such issues, and what we refer to as harmonic function simply resulted from certain features of the compositional methods employed by past composers. In addition, not only was a notion of harmonic function never explicitly part of the compositional process itself, but furthermore it only appears salient given our particular analytical models that value left-to-right syntax. In lieu of such an approach, the discussion here has considered numerous ways that composers of previous centuries were able to compose "functional" harmony, both diatonic and chromatic, while not explicitly possessing a theory of harmonic tendency. Along these lines the discussions considered how the logic of the process might have differed for past composers, how they may have started from a melody, then realized an accompaniment, then chromatically altered it. Temporarily bracketing the assumed methodological priority of a notion of harmonic function in generating harmonic progressions, as well as the assumed equation between its analytical salience and compositional efficacy that it entails, may not only offer us a clearer perspective on the relationship between theory and practice than our recent pedagogy perhaps affords, but it may also allow us to explore a host of largely forgotten or heretofore unconsidered features of the compositional process relevant to developing an effective, practical harmony pedagogy.

Profiles, Perceptions, and Practices Related to Customizable Computer-Aided Instruction among Postsecondary Aural Training Instructors

By Sheila Clagg Cathey and Jay Dorfman

Introduction and Purpose of the Study

With this study, we sought to contribute to the understanding of how postsecondary aural training instructors use CAI. While studies of technology's effectiveness have contributed to the development and legitimacy of aural training CAI, they have largely neglected instructors' approaches to CAI. In addition, it should not be assumed that all instructors who use CAI do so in the same ways; modifications in approaches to CAI may result in vastly varying educational outcomes. The purpose of this study was to determine, based on demographic variables and educational characteristics, the ways in which instructors approach the uses of CAI in their classrooms and curricula. By studying instructors' uses of CAI, the aural training profession can enhance technological practices, and can address current and future needs in the profession among instructors who use CAI.

Because "literally hundreds" of aural training programs are available, we selected a target group from one representative application for the purpose of manageability.[1] To expand the knowledge base in aural training technology integration, this non-experimental quantitative study targeted instructors who use MacGAMUT because this software is representative of customizable instructor options that can be tailored to postsecondary curricula. We recognize that numerous CAI applications exist and play a vital role in postsecondary aural training; our purpose was to examine the functionality of the representative software. Other CAI programs were eliminated because they contain components for sight singing, playing or singing with an accompaniment, improvisation, or composition (e.g., Band-in-a-Box, Hearing Music, Making Music, Playing Music, Practica Musica, SmartMusic); routines for primary- and secondary-school students (e.g., Alfred's Essentials of Music

[1]Deron McGee, "Aural Skills, Pedagogy, and Computer-Assisted Instruction: Past, Present, and Future," *Journal of Music Theory Pedagogy* 14 (2002): 119; Thomas E. Rudolph, *Teaching Music with Technology* (Chicago, IL: GIA, 1996), 71.

Theory); or, have a game-based approach (e.g., Hearing Music). Approaches requiring minimal instructor interaction were also eliminated, including guided-instruction software (e.g., Music Ace) and Internet-based CAI (e.g., Teoria.com).

The software selected for this study was limited to one that encourages instructors' hands-on involvement and emphasizes typical components of dictation skills in postsecondary education (e.g., intervals, scales, chords, melodic dictation, harmonic dictation, and rhythmic dictation).[2] MacGAMUT and Practica Musica are flexible-practice applications that encourage instructors' involvement through extensive options for creating custom content.[3] Practica

[2] As Gary Karpinski notes, "Many courses of study in aural skills begin with 'basic' musical components such as scales, intervals, and chord identification" (*Aural Skills Acquisition: The Development of Listening, Reading, and Performing Skills in College-Level Musicians* (Oxford, England: Oxford University Press, 2000), 19). This theoretical framework—known as objectivism and rooted in behaviorist psychology—is the belief that students must master basic aural elements before integrating them into larger contexts of music and is the most prevalent framework used in teaching dictation. See Ted Buehrer, "An Alternative Pedagogical Paradigm for Aural Skills: An Examination of Constructivist Learning Theory and its Potential for Implementation into Aural Skills Curricula" (PhD diss., Indiana University, 2000), ProQuest (UMI No. 9966041); Sheila Clagg Cathey, "Profiles, Perceptions, and Practices Related to Customizable Computer-Aided Instruction (MacGAMUT) Among Postsecondary Aural-Training Instructors" (DMA diss., Boston University, 2014), ProQuest (UMI No. 3581009); Kate Covington and Charles Lord, "Epistemology and Procedure in Aural Training: In Search of a Unification of Music Cognitive Theory with its Applications," *Music Theory Spectrum* 16/2 (1994): 159–170; Charles Lord, "Harnessing Technology to Open the Minds: Beyond Drill and Practice for Aural Skills," *Journal of Music Theory Pedagogy* 7 (1993): 105–118. Objectivism in aural training dates back to the earliest known textbook on dictation (Michael Traugott Pfeiffer, *Gesangbildungslehre nach Pestalozzischen Grundsätzen: 1* (Zürich, Switzerland: H. G. Nägeli, 1810), as cited in Roy Templeton Will, "The History and Development of Musical Dictation" (MM thesis, Eastman School of Music, 1939)). Constructivism, on the other hand, emphasizes learner interaction and recognizes that knowledge is constructed through learners' experiences. For alternative approaches to objectivism, see Buehrer, "An Alternative Pedagogical Paradigm," 1–231; Kate Covington, "An Alternative Approach to Aural Skills Pedagogy," *Journal of Music Theory Pedagogy* 6 (1992): 5–18; Covington and Lord, "Epistemology and Procedure," 159–170; and Lord, "Harnessing Technology," 105–118.

[3] Flexible-practice CAI "has the express purpose of developing skills, but adds features that allow flexibility of use for both instructors and musicians seeking self-improvement" (David Brian Williams and Peter Richard Webster, *Experiencing Music Technology*, 3rd ed. (Boston, MA: Schirmer Cengage Learning, 2008), 409). The most popular aural-training CAI for postsecondary students is framed around a

Musica was further eliminated because of components that are beyond the scope of this study (e.g., music theory, sight singing, playing or singing with an accompaniment, improvisation, composition).

Research Questions

Several research questions guided data collection for this study:

1. What are the demographic characteristics and educational backgrounds of postsecondary aural training instructors who use CAI as a tool for teaching dictation skills?
2. What are the practices of postsecondary aural training instructors who use CAI as a tool for teaching dictation skills?
3. What influences do demographic and educational characteristics of postsecondary aural training instructors assert on their software usage practices?

Previous Research

While MacGAMUT was used in this study's procedures to investigate instructors' CAI practices, previous researchers who have studied aural training technology have primarily been concerned with the effectiveness of, and students' attitudes

drill-and-practice model (see Buehrer, "An Alternative Pedagogical Paradigm," 1–231; Lord, "Harnessing Technology," 105–118; Williams and Webster, *Experiencing*, 409) or flexible-practice model (see Lord, "Harnessing Technology," 105–118; Williams and Webster, *Experiencing*, 409). Flexible practice (an extension of drill and practice) may be more appealing because it provides instructors with options to customize and evaluate student progress; however, like drill and practice, flexible practice is framed around objectivist theory and becomes a mere extension of the objectivist classroom (Lord, "Harnessing Technology," 105–118). Cathey notes, "Whether drill-and-practice or flexible-practice software, objectivism is the primary reason for creating drills and is the most prevalent framework found in aural-training CAI" ("Profiles, Perceptions, and Practices," 19).

toward technology.[4] All but one aural training study indicated

[4] See Raynold L. Allvin, "Computer-Assisted Music Instruction: A Look at the Potential," *Journal of Research in Music Education* 19, no. 2 (1971): 131–143; Philip Baczewski, "Experience and Evaluation: Ear-training CAI in Action" (paper presented at the meeting of Texas Music Educators Association Convention, San Antonio, TX, 1980); Ann K. Blombach, "OSU's Phoenix Music Project: An Alternative to PLATO and the Micros" (paper presented at the College Music Society Annual Conference, Cincinnati, OH, October 1981); James J. Canelos et al, "Evaluation of Three Types of Instructional Strategy for Learner Acquisition of Intervals," *Journal of Research in Music Education* 28, no. 4 (1980): 243–249; James Caldwell Carlsen, "An Investigation of Programmed Learning in Melodic Dictation by Means of a Teaching Machine using a Branching Technique of Programming" (PhD diss., Northwestern University, 1962), ProQuest (AAT 6301274); James Caldwell Carlsen, "Programed Learning in Melodic Dictation," *Journal of Research in Music Education* 12, no. 2 (1964): 139–148; Fred T. Hofstetter, "GUIDO: An Interactive Computer-Based System for Improvement of Instruction and Research in Ear Training," *Journal of Computer-Based Instruction* 1, no. 4 (1975): 100–106; Fred T. Hofstetter, "Evaluation of a Competency-Based Delivery of Aural Interval Identification," *Journal of Computer-Based Instruction* 27, no. 4 (1979): 201–213; Fred T. Hofstetter, "Applications of the GUIDO System to Aural Skills Research, 1975–1980," *College Music Society* 21, no. 2 (1981): 46–53; Rosemary N. Killam et al, "AMUS: The Computer in Music Instruction" (paper presented at the Texas Music Educators' Association Conference, Fort Worth, TX, February 8, 1979); Wolfgang E. Kuhn, "Computer-Assisted Instruction in Music: Drill and Practice in Dictation," *College Music Symposium* 14 (1974): 89–101; Randall G. Pembrook, "Some Implications of Students' Attitudes Toward a Computer-Based Melodic Dictation Program," *Journal of Research in Music Education* 34, no. 2 (1986): 121–133; Robert W. Placek, "Design and Trial of a Computer-Assisted Lesson in Rhythm," *Journal of Research in Music Education* 22, no. 1 (1974): 13–23; Bernard William Poland, "An Investigation of Some Aural and Notational Elements in Music Theory" (PhD thesis, Ohio State University, 1960), ProQuest (UMI No. 60–2129); Kenneth Harold Smith, "The Effectiveness of Computer-Assisted Instruction on the Development of Rhythm Reading Skills among Middle School Instrumental Students" (PhD thesis, University of Illinois at Urbana-Champaign, 2002), ProQuest (UMI No. 3070051); Kenneth Harold Smith, "The Effect of Computer-Assisted Instruction and Field Independence on the Development of Rhythm Sight-Reading Skills of Middle School Instrumental Students," *International Journal of Music Education* 27, no. 1 (2009): 59–68, doi: 10.1177/0255761408099064; Charles L. Spohn, Jr., "An Exploration in the Use of Recorded Teaching to Develop Aural Comprehension in College Music Classes" (PhD diss., Ohio State University, 1959), ProQuest (AAT 5905941); Charles L. Spohn, Jr., "Programming the Basic Materials of Music for Self-Instructional Development of Aural Skills," *Journal of Research in Music Education* 11 (1963): 91–98; Charles L. Spohn, Jr. and Bernard William Poland, "An Evaluation of Two Methods using Magnetic Tape Recordings for Programed Instruction in the Elemental Materials of Music," National Defense Education Act, Title 7, Project No. 876 (Columbus, OH: The Ohio State University Research Foundation, 1964); Edward A. Tarratus,

that students using technology for dictation drill made significant improvements over students being taught solely with traditional methods of instruction.[5] Because in-class dictation drills may be regarded as a "waste of valuable class time,"[6] aural training technology has provided instructors with the option to spend less time on in-class drills and more time teaching dictation strategies or other areas of musicianship.[7] Although some instructors use CAI as an entire replacement of in-class drill,[8] most use it as an out-of-class practice tool,[9] implying that face-to-face instruction remains central.

Jr. and Charles L. Spohn, Jr., "Cooperative Research in Programed Learning: Taped Interval Discrimination Drills," *Journal of Research in Music Education* 15, no. 3 (1967): 210–214; Jack A. Taylor, "Activities at Florida State University," *Association for the Development of Computer-Based Instructional Systems (ADCIS) News* 12, no. 6 (1980): 58–59; Jack A. Taylor, "The MEDICI Melodic Dictation Computer Program: Its Design, Management, and Effectiveness as Compared to Classroom Melodic Dictation," *Journal of Computer-Based Instruction* 5, nos. 1–2 (1982): 11–21.

[5] Tarratus and Spohn, "Cooperative Research," 210–214.

[6] Michael A. Arenson, "Computer-Based Instruction in Musicianship Training: Some Issues and Answers," *Computers and Humanities* 18 (1984): 157.

[7] CAI may offer instructors more time to demonstrate the relevance of aural skills to music literature and the added benefit of freeing teaching time from redundant and excessive in-class dictation drills. Instructors may use the extra class for dictation games (Deborah Rifkin and Diane Urista, "Developing Aural Skills: It's Not Just a Game," *Journal of Music Theory Pedagogy* 20 (2006): 57–79); whiteboard or blackboard activities (Barbara Liebhaber, "Steps Toward Successful Dictation," *Teaching Music* 8, no. 6 (2001): 32–35); improvisation (Covington, "An Alternative Approach," 5–18; Steve Larson, "Integrated Music Learning and Improvisation: Teaching Musicianship and Theory through 'Menus, Maps, and Models,'" *College Music Symposium* 35 (1995): 76–90; Rifkin and Urista, "Developing," 57–79); composing melodies (Rifkin and Urista, "Developing," 57–79); or alternative approaches to traditional dictation, such as aural identification of timbre, texture, dynamics, range, density, spatial effects, and large-scale structure (Covington and Lord, "Epistemology and Procedure," 159–170; Lord, "Harnessing Technology," 105–118; Steven G. Laitz, "Paths to Musicianship," in *Musicianship in the 21st Century: Issues, Trends and Possibilities*, ed. S. Leong (Sydney, Australia: Australian Music Centre, 2003), 130–150; George Pratt, *Aural Awareness* (Bristol, PA: Open University Press, 1990); Peter Silberman, "Post-Tonal Improvisation in the Aural Skills Classroom," *Music Theory Online* 9, no. 2 (2003); and Diane Urista, "Beyond Words: The Moving Body as a Tool for Musical Understanding," *Music Theory Online* 9, no. 3 (2003).

[8] Cathey, "Profiles, Perceptions, and Practices."

[9] Sheila Clagg Cathey, "Current Practices and Curriculum Needs among Postsecondary Oklahoma Music Theory Instructors" (paper presented at the annual meeting of the Oklahoma Music Theory Round

No known previous researchers have investigated the influence of independent and dependent variables on instructors' uses of aural training CAI. Independent variables investigated in the current study were years of experience in teaching aural skills, years of experience in using the selected software, gender, and highest degree obtained. Dependent variables were importance of monitoring students' software usages, impact of CAI on student learning, impact of instructors' interactions and involvement with the software on student learning, impact of customization on student learning, importance of requiring students to use Mastery Mode, importance of using Practice Mode, importance of using Make My Own Drills, and how often students are required to submit CAI assignments. Spangler's thesis is perhaps the study that comes closest to the present one in terms of aural training CAI use; however, Spangler minimally addressed instructors' interactions and involvement with CAI.[10]

Literature in postsecondary instructors' practices with aural training technology was insufficient; therefore, literature on K-12 instructors' uses of music technology was explored. Previous researchers have suggested that music teachers do not have the same type of training in technology as they do in other areas of music, and thus they feel underprepared to incorporate technology into their teaching.[11] While some extraordinary uses of music technology

Table, Oral Roberts University, Tulsa, OK, October 11, 2013); Cathey, "Profiles, Perceptions, and Practices"; and Randall G. Pembrook and H. Lee Riggins, "Send Help! Aural Skills Instruction in U.S. Colleges and Universities," *Journal of Music Theory Pedagogy* 4, no. 2 (1990): 231–241.

[10]Douglas Raymond Spangler, "Computer-Assisted Instruction in Ear-Training and its Integration into Undergraduate Music Programs during the 1998–1999 Academic Year" (MM thesis, Michigan State University, 1999), ProQuest (UMI No. 1395453).

[11] Jay Dorfman, "Learning Music with Technology: The Influence of Learning Style, Prior Experiences, and Two Learning Conditions on Success with a Music Technology Task" (PhD diss., Northwestern University, 2006), ProQuest (UMI No. 3230095); Dorfman, *Theory and Practice of Technology-Based Music Instruction* (New York, NY: Oxford University Press, 2013); Jason Charles Meltzer, "A Survey to Assess the Technology Literacy of Undergraduate Music Majors at Big-10 Universities: Implications for Undergraduate Courses in Music Education Technology" (PhD thesis, University of Illinois at Urbana-Champaign, 2001), ProQuest (UMI No. 3023143); Grace Ohlenbusch, "A Study of the Use of Technology Applications by Texas Music Educators and the Relevance to Undergraduate Music Education Curriculum" (DMA diss., Shenandoah Conservatory, 2001), ProQuest (UMI No. 3010524); Sam Reese and James Rimington, "Music Technology in Illinois

are being carried out in the K–12 classroom, the reviewed literature indicated that K–12 music teachers use administrative technology more frequently that music technology.[12] These K-12 music teachers, however, ranked music CAI as the most important topic that should be included in professional development opportunities[13] and in the undergraduate music education curriculum.[14] Further, the majority of K-12 music teachers lack formal training in music technology, and are rather self-taught or peer-taught.[15] These findings show a need for music technology training and integration, especially in the various uses of CAI.[16] Aural training instructors, therefore, have an important responsibility in modeling, monitoring, and passing on technical skills related to CAI to the next generation of music educators.

Gender was explored based on a suggested need to investigate gender differences as a variable in achievement with music technology.[17] Gender equivalency in using music technology, as

Public Schools," *Update: Applications of Research in Music Education* 18, no. 2 (2000): 27–32; and Jack A. Taylor and John J. Deal, "The Status of Technology Integration in College Music Methods Courses: A Survey of NASM Colleges and Universities" (paper presented at the annual meeting of the Association for Technology in Music Instruction, Santa Fe, NM, 2003).

[12]In *Theory and Practice*, Dorfman observed creative uses of technology on the K–12 level, such as an elementary school music teacher who assigned in-class iPad projects using GarageBand and SoundSlate (now, replaced by AudioBoard), and high school music teachers assigning students to compose music for movie trailers and creating podcasts with GarageBand.

[13]Reese and Rimington, "Music Technology," 27–32.

[14]Ohlenbusch, "Use of Technology Applications," 1–214.

[15]Reese and Rimington, "Music Technology," 27–32.

[16]For a framework for technology integration, see articles related to *Technological Pedagogical and Content Knowledge* (TPACK), such as Judith Harris, Punya Mishra, and Matthew J. Koehler, "Teachers' Technological Pedagogical Content Knowledge and Learning Activity Types: Curriculum-Based Technology Integration Reframed," *Journal of Research on Technology in Education* 41, no. 4 (2009): 393–416; Matthew J. Koehler and Punya Mishra, "What Happens When Teachers Design Educational Technology? The Development of Technological Pedagogical Content Knowledge," *Journal of Educational Computing Research* 32, no. 2 (2005): 131–152; and Punya Mishra and Matthew J. Koehler, "Technological Pedagogical Content Knowledge: A Framework for Teacher Knowledge," *Teachers College Record* 108, no. 6 (2006): 1017–1054.

[17]Victoria Armstrong, *Technology and the Gendering of Music Education* (Burlington, VT: Ashgate, 2011); Ann K. Blombach, "The Future of Music

documented in the current study, was found in some studies,[18] while inequalities in respect to gender and music technology were found in others.[19] Earlier literature on gender differences indicated that males used computers[20] and music technology[21] more frequently than females. Recent studies, however, have shown no significant difference in frequency of use or computer self-efficacy.[22]

CAI: Bringing the Pie in the Sky Down to Earth" (paper presented at the New England Conference of Music Theorists Annual Conference, Hartford, CT, April 2001); Jay Dorfman, "Learning Music with Technology"; Jay Dorfman, *Theory and Practice*; Rosemary N. Killam et al, "Research Applications in Music CAI," *College Music Symposium* 21, no. 2 (1981): 37–45; Peter Richard Webster, "Computer-Based Technology and Music Teaching and Learning," in *The New Handbook of Research on Music Teaching and Learning*, ed. R. Colwell and C. Richardson (New York, NY: Oxford University Press, 2002), 416–439; and Peter Richard Webster, "Key Research in Music Technology and Music Teaching and Learning," *Journal of Music, Technology and Education* 4, nos. 2–3 (2011): 115–130, doi: 10.1386/jmte.4.2-3.115_1.

[18] See, for example, Jeffrey E. Bush, "The Effects of a Hypermedia Program, Cognitive Style, and Gender on Middle School Students' Music Achievement," *Contributions to Music Education* 27, no. 1 (2000): 9–26; and Comber et al, "Girls, Boys and Technology in Music Education," *British Journal of Music Education* 10, no. 2 (1993): 123–134.

[19] See, for example, Chris Comber et al, "The Effects of Age, Gender and Computer Experience upon Computer Attitudes," *Educational Research* 39 (1997): 123–133; and Meltzer, "Technology Literacy."

[20] Comber et al, "Age, Gender and Computer Experience," 123–133; Steve M. Dorman, "Technology and the Gender Gap," *The Journal of School Health* 68, no. 4 (1998): 165–166; Meltzer, "Technology Literacy"; and Janet Schofield, *Computers and Classroom Culture* (Cambridge, United Kingdom: Cambridge University Press, 1995).

[21] See, for example, Meltzer, "Technology Literacy," 78–85.

[22] Fannie Johnson Albert, "Computer Learning and Usage by Older Adults" (EdD diss., Texas A&M University at Commerce, 2013), ProQuest (UMI No. 3562480); Constance D. Blanson, "A Non-Experimental Investigation of the Impact of Gender, Academic Skills, and Computer Skills on Online Course Completion Rates" (PhD diss., Capella University, 2013), ProQuest (UMI No. 3557591); Donald Wayne Sorah, Jr., "The Effects of Music Teacher Beliefs, Training, and Resources on Use of Technology" (PhD diss., Florida State University, 2012), ProQuest (UMI No. 519412).

Methodology

Design

We designed a 31-item questionnaire for this non-experimental quantitative study.[23] Ann Blombach—the designer of MacGAMUT—checked the accuracy of software-related details, lending item validity to the instrument.[24] An expert panel of three university faculty advisors, each with significant experience using MacGAMUT and in researching aural skills pedagogy, identified questions that were unclear or ambiguous, and gave suggestions for modifications. The survey was pilot-tested with an anonymous random sample of the target population. Cronbach's Alpha was used to ensure the internal consistency of the instrument and was applied to the results of the pilot test before it was made available to the participants. Results of the pilot test yielded an overall alpha of .973, indicating a very reliable instrument. Because the MacGAMUT database is confidential, Blombach forwarded an email from the researchers with a link to the questionnaire (see Survey Instrument) to all instructors in the database who have registered their software and have deliverable email addresses (N = 1,717). Blombach forwarded two email reminders written by the researchers in two-week increments. The respondents (N = 331) included 53 pre-college instructors who were eliminated from the results, leaving a final sample of 278 anonymous postsecondary respondents.

[23] The survey is available at http://jmtp.ou.edu/journal.

[24] Before an expert panel of advisors examined the questionnaire, the following changes were made based on Blombach's recommendations: we removed the words "allow students to use" (Q15); removed "in a non-graded manner (practice mode)" and "in a graded manner (mastery mode)" because these response options were unrelated to the other response options (Q22); alphabetized textbook choices by author's name to avoid a biased order (Q23); removed "for remedial work" to avoid appearing judgmental toward instructors who use Prep Presets (Q24); added Presets and Libraries for Stefan Kostka and Dorothy Payne's textbook (*Tonal Harmony with an Introduction to Twentieth-Century Music*, 6th ed. New York, NY: McGraw-Hill, 2009) and Joel Phillips, Jane Piper Clendinning, and Elizabeth West Marvin's textbook (*The Musician's Guide to Aural Skills*, New York, NY: W. W. Norton, 2005) (Q24); added "I use my own libraries" and "Other libraries" (Q24); removed "timbre and volume of individual voices" because the default already allows students to use this option (Q29); deleted "identification of what must be notated, including the inner voices" because it was ambiguous (Q29); and added "allowing responses from a MIDI/Virtual Keyboard" (Q29). Neither Blombach nor any other MacGAMUT employee initiated the study, provided funding, or had access to the anonymous raw data.

Sampling Procedures

We used as the population an entire database of instructors who use MacGAMUT. We did not exclude any postsecondary instructors who use MacGAMUT in the United States or other locales.[25] This was an attempt to be more global by attaining a thorough census of these instructors, but it was also beyond our control to stratify the sample because we did not have access to the confidential database of instructors and the database is not grouped according to teaching levels, teaching specialties, institutions, or countries. Out of necessity, a census study was the only viable option for examining the target population. Unlike previous studies that limited data collection to the music theory coordinator, the necessity in using an entire database allowed us to recognize variations in individual pedagogical differences among persons with different academic ranks/positions which may have been overlooked.[26]

Data Analysis

The data analysis for this study examined the relationships between multiple variables; therefore, it extended beyond simple descriptive analysis and also used inferential statistics. Multivariate statistics were chosen to simultaneously analyze whether respondents, grouped using four independent variables, differed on eight dependent variables. Survey results were exported from SurveyMonkey to JMP Pro 9 Statistical Software, a version of SAS, to analyze the data. The level of $p = .05$ was used for all tests of significance; p values less than .05 indicate that a difference between groups was beyond that which could be attributed to chance.

Research Validity

Internal validity is the degree to which a research design rules out explanations for a study's findings other than that the variables involved.[27] The current research violated internal validity with selection threat. As stated in the section on sampling procedures,

[25] Instructors who use MacGAMUT teach at institutions in Australia, Belgium, Brazil, Canada, China, Finland, France, Israel, Italy, Korea, Mexico, Nepal, Netherlands, New Zealand, Norway, Philippines, Slovenia, Sweden, Taiwan, Turkey, United Kingdom, and the United States (Ann Blombach, "MacGAMUT Institutions" (Excel worksheet, 2010)).

[26] See, for example, Pembrook and Riggins, "Send Help!" 231–241.

[27] Robert E. Slavin, *Research Methods in Education: A Practical Guide* (Boston, MA: Allyn and Bacon, 1984).

we did not exclude any potential postsecondary instructors who use MacGAMUT. Steps were taken to reduce additional threats to internal validity. We used an expert panel of advisors and conducted a pilot test with an anonymous, randomly-selected group to ensure content validity of the instrument.

"External validity, or generalization, refers to the degree to which the findings of a study using a particular sample have meaning for other settings or samples."[28] No randomization was used in the current study because an entire target population was invited to participate. A threat to validity was a low response rate (19.28%; N = 331) in comparison to the entire population of instructors with deliverable email addresses who have registered their MacGAMUT software (N = 1,717).[29] Due to the small sample size, low response rate, and lack of randomization, results and conclusions may not be wholly generalizable to the entire target population.

Results

The following results are sequenced according to three distinct sections of the questionnaire: instructors' profiles, perceptions, and practices. Results conclude with an overview of inferential findings.

Instructors' Profiles

Research Question 1 asked, "What are the demographic characteristics and educational backgrounds of postsecondary aural training instructors who use CAI as a tool for teaching dictation skills?" Respondents had between one and 40 years of experience in teaching postsecondary aural skills (mean (M) = 10.84). Years of experience in using the selected software ranged from zero to 23 years (M = 4.72). The majority of instructors identified music theory / aural skills (66.19%) as the primary area of teaching responsibility, followed by applied music (13.67%) as the next highest response. Out of 26 identified primary instruments, piano (33.09%) and voice (12.73%) were most common.[30] The majority (59.85%) of respondents

[28] Slavin, *Research Methods*, 109.

[29] The actual number of current users is unknown because instructors remain in the database until they request to be removed; free upgrades are given; and some servers, email recipients, and anti-virus programs stop all mail from macgamut.com (Ann Blombach, personal communication, March 31, 2011).

[30] Based on the current sample, piano was the most common primary instrument of the respondents. Further evidence for the

indicated that they have obtained a doctorate, indicating a well-educated sample.

The selected software is used among all career age groups. The average age was 43.8, ranging from 22-year-old graduate assistants to a 77-year-old professor emeritus. The most frequent respondents were 30 to 34 years old.[31] Among the entire sample, associate professors (17.98%) and professors (17.62%) were the most common ranks, suggesting the inclusion of veteran professors. Assistant professors (15.11%) were the third most common rank. The sample consisted of a sizeable minority (30.94%) of part-time faculty,[32] comprised of adjunct professors (14.39%), graduate assistants (13.31%),[33] and high school music instructors (3.24%) who teach part-time at the postsecondary level. Table 1 displays gender, highest degree obtained, and academic rank or position of survey participants compared to the population of music theory/aural skills instructors in the College Music Society (CMS) Directory. The targeted sample and the CMS population have similar percentages of assistant professors and professors, yet the percentage of doctoral recipients and rank of "instructor" were significantly different between groups. Among survey respondents, doctoral recipients

prominence of piano is that the second highest primary instrument (voice) trailed behind piano by 20.36%. Moreover, applied music instructors (predominantly piano) comprised the second highest group of respondents, second only to instructors who primarily teach music theory/aural skills. This may imply that piano faculty members are being employed to teach aural training as one of their responsibilities.

[31] The most common rank among 30- to 34-year olds was assistant professor, implying that these instructors may be experiencing excitement over promising new careers, and thus, an eagerness to make a contribution in aural-training pedagogy.

[32] Lecturers (9.71%) and instructors (3.24%) comprised another 12.95% of the sample; however, it is unknown whether these ranks are full- or part-time appointments. If they are part-time appointments, the percentage of part-time faculty for the current sample could be as high as 43.89%.

[33] This is consistent with previous research, in that graduate assistants comprised 16.75% of respondents in Richard B. Nelson's nationwide music theory study ("The College Music Society Music Theory Undergraduate Core Curriculum Survey—2000," *College Music Symposium* 42 (2002): 60–75), and up to 19.5% in Jeffrey L. Gillespie's aural-training sample ("Melodic Dictation Scoring Methods: An Exploratory Study," *Journal of Music Theory Pedagogy* 15 (2001): 50–68). Although an exact number was not provided, Gillespie stated that the "other" category (19.5%) consisted primarily of graduate students.

were significantly higher (p = .048) than CMS, implying that doctoral recipients may be more likely than non-doctoral recipients to use CAI. The rank of instructor was significantly higher (p = .001) in CMS than among survey respondents, which could be a result of nomenclature differences (e.g., adjunct instructor vs. adjunct professor).

	Survey Respondents		CMS Directory	
Demographics	%	*n*	%	*n*
Gender				
Males	54.68%	152	58.88%	1383
Females	44.24%	123	39.89%	937
Unknown Gender	1.08%	3	1.23%	29
Highest Degree				
Doctorate	59.00%	164	45.04%	1058
Master's	34.17%	95	46.32%	1088
Bachelor's	5.03%	14	4.38%	103
H.S. Diploma	0.36%	1	Not an option	N/A
Artist Diploma	Not an option	0	0.30%	7
No Degree Reported	1.44%	4	3.66%	86
Rank or Position				
Adjunct Professor	14.39%	40	10.60%	249
Assistant Professor	15.11%	42	15.28%	359
Associate Professor	17.98%	50	14.43%	339
Professor	17.62%	49	17.45%	410
Visiting Professor	1.08%	3	0.85%	20
Professor Emeritus	0.36%	1	1.96%	46
Lecturer	9.71%	27	7.88%	185
Instructor	3.24%	9	16.60%	390
Graduate Assistant	13.31%	37	Not an option	N/A
H.S. Instructor	3.24%	9	Not an option	N/A
Artist in Residence	None	0	0.34%	8
No Rank Reported	1.08%	3	4.81%	113

Table 1. Survey respondents compared to the CMS directory

Compared to the CMS data (see Table 1), gender was fairly balanced with 10.44% more males than females; this is reflective of the profession, yet more evenly balanced than CMS. Academic rank, however, was conspicuously different. Females were

employed most frequently in temporary positions as graduate assistants (16.26%) and contract positions as adjunct professors (15.45%).[34] Males, on the other hand, overall had more stability, being employed most frequently as associate professors (21.19%) and professors (20.53%). Because 54.92% of females and 63.82% of males had obtained doctorates, highest degree obtained was apparently not the reason for rank differences.

The final demographic item assessed respondents' experience with CAI. As a group, respondents identified 30 aural training software packages they had used, indicating general proficiency in CAI experience. Besides MacGAMUT, the most-used programs were MusicTheory.net (n = 135), Practica Musica (n = 111), Benward and Kolosick's (2010) Ear Training: A Technique for Listening (n = 73), Teoria.com (n = 72), Auralia (n = 63), Horvit, Koozin, and Nelson's Music for Ear Training (n = 50), Music Ace (n = 38), and MiBAC (n = 24). Three of the top CAI (MusicTheory.net, Benward and Kolosick's Ear Training, and Teoria.com) are online sources, perhaps projecting mobile preferences of current traditional-age college students known as digital natives.[35]

Instructors' Perceptions

Instructors were asked about a variety of perceptions to determine their teaching effectiveness, most helpful training or technology support, and several software-related perceptions, such as the importance of demonstrating CAI to students. Perceptions

[34] Further investigation is needed regarding gender and rank. Research on gender and rank has also been requested by the Society for Music Theory's (SMT) Committee on the Status of Women (Brenda Ravenscroft, Robert Zierolf, Sharon Krebs, and Harald Krebs, "Addressing the Gender Imbalance" (Session Report by the Committee on the Status of Women at the Society for Music Theory Annual Conference, Nashville, TN, 2008), retrieved from: http://societymusictheory.org/sites/default/files/Nashville_report.pdf).

[35] According to José A Bowen, digital natives learn in "more mobile, customized, and varied ways" (*Teaching Naked: How Moving Technology out of Your College Classroom will Improve Student Learning* (San Francisco, CA: Jossey-Bass, 2012), xiii). Bowen recommended a six-phase cycle that can be used to extend technology uses beyond the physical classroom as a means to create an interactive postsecondary environment for digital natives. Christopher Jones and Binhui Shao indicated that this generation prefers to receive "information quickly" and has a "low tolerance to lectures" ("The Net Generation and Digital Natives: Implications for Higher Education" (Higher Education Academy, York, June 26, 2011) http://oro.open.ac.uk/30014/, 3).

were also used to identify the impact that the selected software and instructors' interactions with the software have on student learning.

On a six-point Likert-type scale, respondents indicated self-perceived competency in their effectiveness of teaching dictation (M = 4.51; SD = 0.85). Instructors who primarily taught composition or music theory/aural skills had a significantly more positive perception of their teaching effectiveness than instructors in other music fields.[36] Terminal degrees had the most positive impact on self-perceived competency among instructors with 10 to 15 years of teaching experience. Among instructors with one to three years of teaching experience, mean scores were almost identical for instructors with bachelor's, master's, and doctoral degrees. Also among this least experienced group, males reported significantly higher (p = .016) self-perceived competency than females with the same amount of experience; yet, there were more female doctoral recipients than male doctoral recipients in this group. As females gained more experience, their perceived effectiveness increased.[37] Females with 10 to 15 years of experience had higher perceived effectiveness than males with the same amount of experience, and were significantly higher (p = .008) than females with one to three years of experience. The entire group of males, however, reported significantly higher (p = .029) self-perceived competency than the entire group of females. Table 2 summarizes descriptive differences among groups.

[36] Respondents who primarily taught composition had a significantly more positive perception of their effectiveness in teaching dictation than those who primarily taught instrumental ensembles (p = .002), choir (p = .032), and music history (p = .042). Instructors who primarily taught music theory/aural skills were significantly higher than instructors who primarily taught instrumental ensembles (p = .019) and choir (p = .038).

[37] Females with 1 to 3 years of experience had a mean score of 4.00, compared to 4 to 9 years of experience (M = 4.37), 10 to 15 years of experience (M = 4.86), and 16 to 40 years of experience (M = 4.52).

Years Teaching	*n*	*Mean*	*Standard Deviation (SD)*
1-3 years	73	4.26	0.88
Male	36	4.50	0.73
Female	35	4.00	0.97
HS Diploma	1	6.00	- -
Bachelor's	10	4.20	0.91
Master's	34	4.23	0.92
Doctorate	26	4.23	0.81
4-9 years	69	4.44	0.79
Male	40	4.48	0.72
Female	29	4.37	0.90
HS Diploma	- -	- -	- -
Bachelor's	2	4.50	0.70
Master's	30	4.33	0.92
Doctorate	36	4.52	0.69
10-15 years	70	4.77	0.80
Male	37	4.66	0.13
Female	33	4.86	0.13
HS Diploma	- -	- -	- -
Bachelor's	1	- -	- -
Master's	15	4.53	0.99
Doctorate	53	4.86	0.70
16-40 years	61	4.57	0.86
Male	36	4.61	0.93
Female	25	4.52	0.77
HS Diploma	- -	- -	- -
Bachelor's	1	- -	- -
Master's	13	4.46	0.87
Doctorate	47	4.57	0.85

Table 2. Self-perceived effectiveness by years teaching aural skills, gender, and highest degree obtained

Instructors were asked to identify the most helpful training or technology support in using the selected software (see Figure 1). The most common answer was "none," followed by the software's technical support, and "other" answers. Self-exploration of the program was the most common "other" answer. Video tutorials, conference demonstrations, workshops, and professional publications were the least common responses.

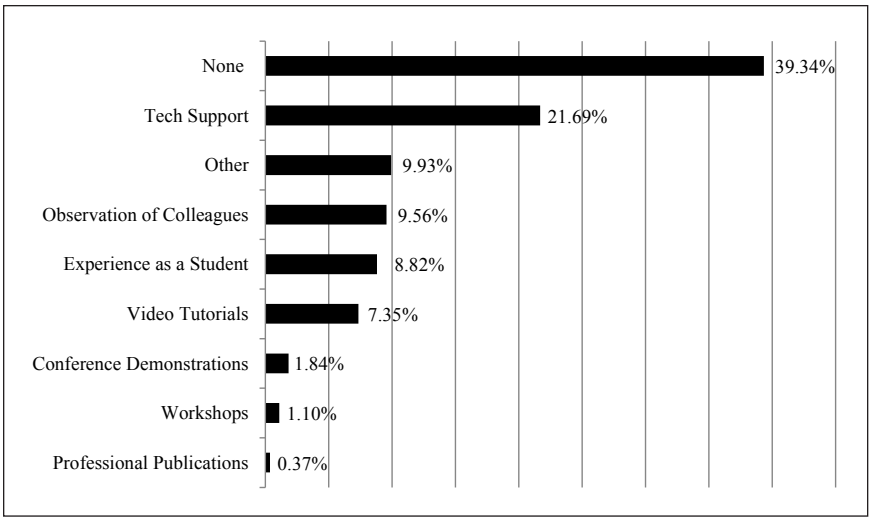


Figure 1. Most helpful training or technology support

Pedagogical techniques used in conjunction with CAI were rated according to their level of importance to respondents (see Figure 2). On a six-point Likert-type scale, checking students' statistics in Mastery Mode and counseling students on effective uses of CAI were the top two responses. Instructors were least likely to check details of the Dates/Times field to see how often and how much time students spend using the selected CAI. For the purposes of this study, monitoring students' work meant that instructors were engaged with students while the software was being used and were providing immediate feedback about how best to use it.

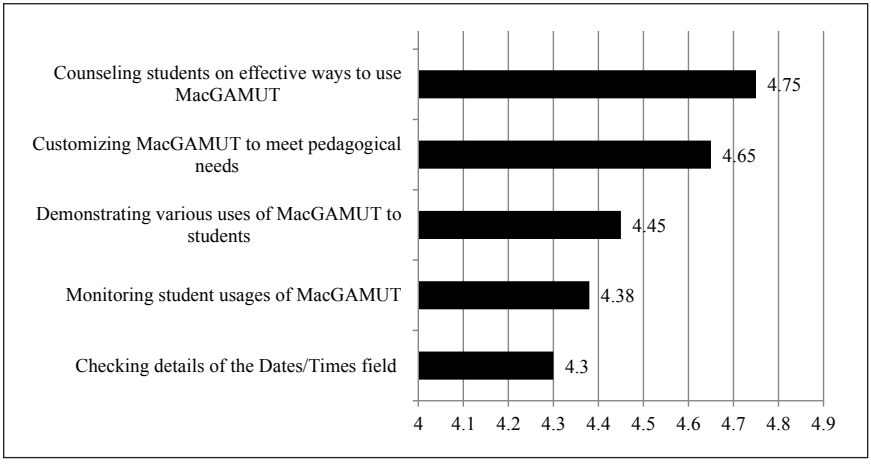


Figure 2. Importance of pedagogical techniques used in conjunction with CAI

On another six-point scale, instructors rated their perceptions of the software's six aural elements for improving aural skills (see Figure 3). Respondents identified MacGAMUT's aural intervals and aural scales as the most effective components for improving aural skills, while harmonic dictation was rated as the least effective.

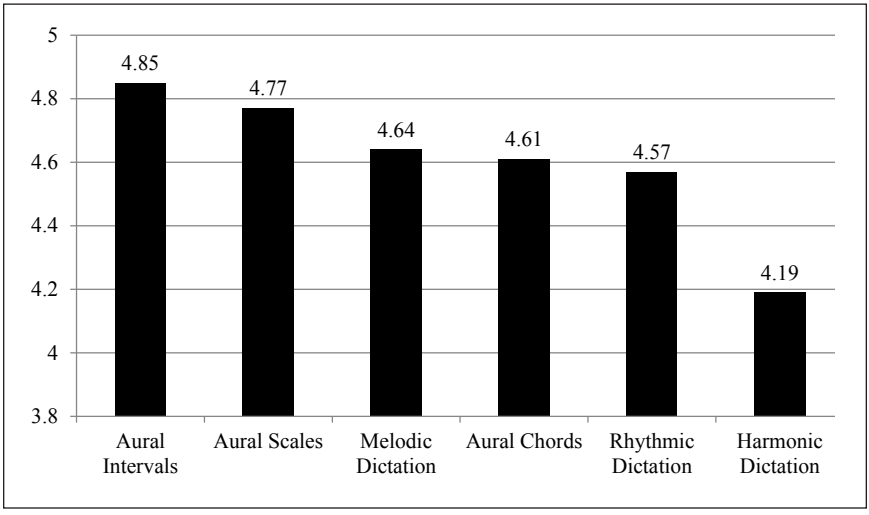


Figure 3. Perceived improvement based on the software's aural components

Instructors also rated their perceptions of technological factors that impact students' dictation skills (see Figure 4). Respondents believe that as instructors, their direct interactions and involvement with the software have the most positive impact on how well students learn dictation skills. Males and females believe with relative equality that the selected software also has a positive impact on student learning. Although CAI with customization features has the potential to provide powerful instructional and learning options that can be tailored to the curriculum and the diverse backgrounds and levels of students, respondents rated customization as the component that has the least positive impact on student learning of dictation skills.

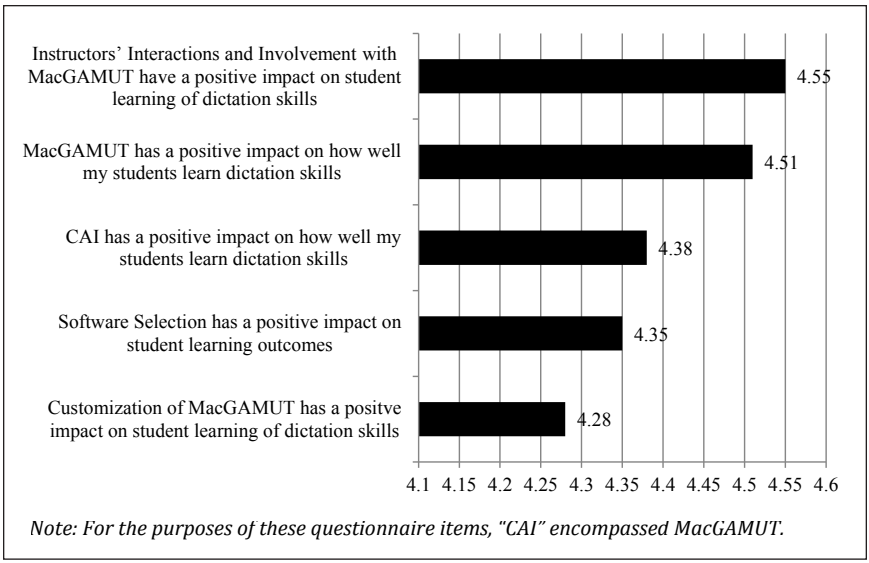


Figure 4. Mean scores for perceived impact of software and instructors' interactions

Instructors' Practices

Research Question 2 asked, "What are the practices of postsecondary aural training instructors who use CAI as a tool for teaching dictation skills?" Practices data included a variety of behaviors, such as current use of the selected software, how instructors use the software, grading of CAI, and how instructors use Presets (default settings), Libraries, and customization features.

The majority (75.91%; n = 208) of respondents were using the selected software at the time of the survey. Out of the instructors who had discontinued using the software, most (59.09%; n = 39) had used it for zero to three years, implying that a lack of experience contributes toward discontinued use. Among all respondents, checking students' statistics in Mastery Mode (M = 4.77; SD = 1.47) yielded the most favorable pedagogical practice measuring hands-on involvement with CAI. Respondents also believe it is important to regularly check students' work using the statistics function (M = 4.14; SD = 1.61), and require students to submit CAI assignments regularly (M = 4.33; SD = 1.44). Further, a strong majority (81.65%; n = 227) reported using MacGAMUT "as a requirement" with their students. Although most instructors require students to regularly submit assignments using Mastery Mode, overall, respondents had a slightly more favorable perception of

Practice Mode (M = 4.66; SD = 1.39) over Mastery Mode (M = 4.56; SD = 1.45).

In this study, CAI assignments from the selected software most frequently contribute 11%-20% of students' overall grades (Figure 5), leaving 80%-90% for other elements such as exams, quizzes, homework, attendance, and participation. The selected software is most often used as a graded supplement to enhance other content, rather than for ungraded practice or extra credit.[38]

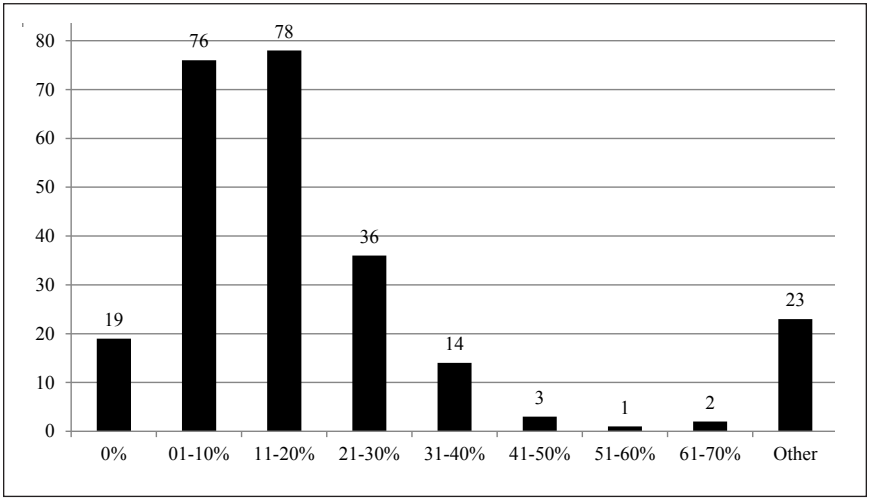


Figure 5. Percentages that CAI contributes to overall grades

As found in Figure 6, the selected software is primarily used as a required, out-of-class practice tool to supplement in-class dictation.[39] It is less often used as an entire replacement of in-class dictation (14.57%), and rarely used as an entire replacement for a traditional course (1.58%).

[38] Spangler, "Computer-Assisted Instruction," found that instructors using MacGAMUT (n = 70) were more likely than instructors using other applications to assign a grade weight for CAI. In Spangler's study, MacGAMUT assignments most frequently contributed 10%–19% (n = 24), 1%–9% (n = 10), and 30%–39% (n = 8) of the students' overall grade. Although the majority (69.57%) in Spangler's study assigned a grade weight, a sizeable minority (30.43%) used MacGAMUT as ungraded practice, extra credit, or "other."

[39] Instructors were asked to select multiple responses.

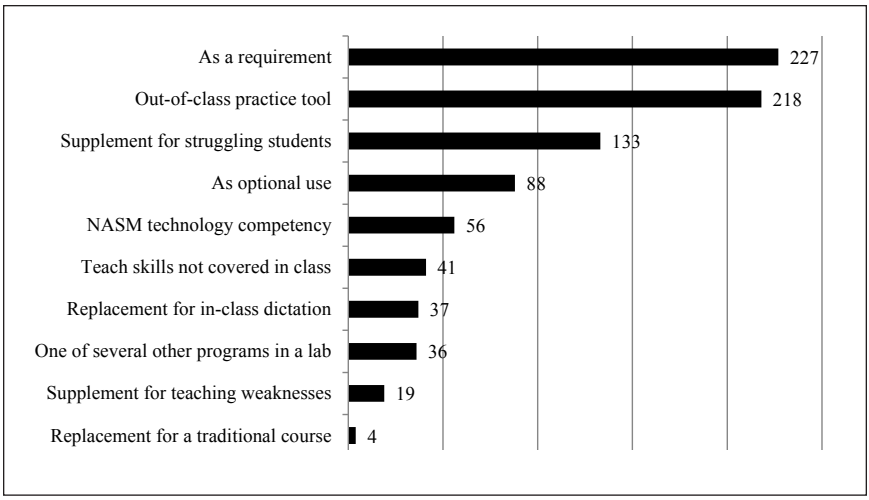


Figure 6. How instructors use CAI with their students

Customization practices indicated that the majority (59.60%) of instructors customizes their uses of the CAI package. Gender was nearly equally matched: 59.09% of females and 60.00% of males customize, implying gender equivalency in technology competency. Instructors with 16 to 40 years of experience in teaching aural skills were the most likely to customize their uses of CAI.

Overall, 79.85% of instructors in this study make CAI Presets easier, rather than harder. They primarily customize Presets to fit the curriculum. In some courses, such as Fundamentals of Music, Presets are made easier, while in other courses, such as Aural Skills IV, Presets are made more difficult. Although instructors have several library files from which to choose, the majority (60.40%) of respondents use the software's Original Presets and Libraries.[40] Although instructors modify libraries, they typically do not create entirely new libraries. Further, the majority (75.58%) of respondents do not create new levels, indicating overall satisfaction with the packaged levels.

Instructors can modify any of the parameter or level settings in the software package in several ways. The most common are increasing the number of hearings before the first answer check (74.48%),

[40] MacGAMUT contains Presets and Libraries for David Damschroder's *Listen and Sing: Lessons in Ear-Training and Sight-Singing* (New York, NY: Schirmer Books, 2005); Phillips, Clendinning, and Marvin's *The Musician's Guide*; Kostka and Payne's *Tonal Harmony;* Much Easier Presets MG6.mgp; Much Harder Presets MG6.mgp; and Prep Presets MG6.mgp. These varieties of Presets imply a need for software designers to have multiple Presets for various levels and backgrounds of students.

allowing students to choose any tempo (71.72%), providing a choice of levels that students are required to complete (66.21%), and re-ordering levels that students are required to complete (64.14%). Because the majority of customizing instructors allow students to have multiple hearings and reduce the tempo, this may imply that the software's Presets are too challenging.

Relationships among Instructors' Characteristics

Research Question 3 sought to determine the influences that demographic and educational characteristics of postsecondary aural training instructors assert on their software usage practices. This question was answered by the use of two multiple analyses of variance (MANOVAs) and Post Hoc ANOVAs. MANOVA 1 was related to instructors' perceptions, while MANOVA 2 was related to instructors' practices. Dependent variables (DVs) for MANOVA 1 were the importance of monitoring students' software usages, the impact of CAI on student learning, the impact of instructors' interactions and involvement with the software on student learning, and the impact of customization on student learning. DVs for MANOVA 2 were the importance of requiring students to use Mastery Mode, the importance of using Practice Mode, the importance of using Make My Own Drills, and how often students are required to submit CAI assignments. Independent variables (IVs) used in both MANOVAs were the years of experience in teaching aural skills, the years of experience in using the selected software, gender, and the highest degree obtained.

The results of MANOVA 1 and MANOVA 2 are shown in Table 3 and Table 4 respectively. These tables show that the years of experience in using the selected software, the years of experience in teaching aural skills, and gender had significant influences on the variability of dependent variables (DVs). The highest degree obtained did not have a significant influence on the variability of DVs in either MANOVA. Although statistical significance was found for the years of experience in teaching aural skills (Table 4), the Post Hoc ANOVA did not reveal any specific interactions with DVs that were contributing to the statistically significant result. Thus, gender and years of experience in using the selected software were the only two IVs that revealed specific interactions with DVs (Table 5).

Identity	Value[a]	*F*	*df*	*p*
Whole Model	0.785	1.69	32	.010*
Years Teaching AS[b]	0.952	0.87	12	.567
Gender	0.055	3.02	4	.018*
Highest Degree	0.946	1.01	12	.434
Years Using Selected Software	0.067	3.65	4	.006*

Note.
[a] The value of each multivariate statistical test in the report
[b] Aural Skills
* = $p < .05$

Table 3. MANOVA 1 results

Identity	Value	*F*	*df*	*p*
Whole Model	0.811	1.58	32	.022*
Years Teaching AS	0.900	2.10	12	.015*
Gender	0.033	1.96	4	.100
Highest Degree	0.965	0.68	12	.764
Years Using Selected Software	0.081	4.78	4	.001*

Note.
* = $p < .05$

Table 4. MANOVA 2 results

Independent Variables	Dependent Variables	*p*
Years of experience in using the selected software	CAI has a positive impact on student learning	< .0001*
	Instructors' interactions with the software	< .0001*
	Customization has a positive impact on student learning	.004*
	Required use of Mastery Mode	.005*
	How often assignments are submitted	.011*
Gender	Monitoring student usages of the software	.017*

Note.
* = $p < .05$

Table 5. Significant Tukey-Kramer HSD Post Hoc ANOVA test results

As shown in Table 5, statistical significance was found for the influence of gender on monitoring student usages of the selected software, in that females were significantly higher ($p = .017$) than males. Monitoring student usages implies that females in the present study are spending time with students, and may be more likely to develop one-on-one relationships with students and to initiate positive instructional strategies. Additional items related to instructors' involvement with students' work were investigated to determine if females and males interact differently in other areas. Females were also significantly higher than males in the importance of counseling students on effective ways to use the software ($p = .006$), checking students' statistics in Mastery Mode ($p = .049$), and how often students' work is checked using the statistics function ($p = .007$).

Years of experience in using the selected software had the most striking influence because it demonstrated a significant relationship in both MANOVAs and had a significant influence on five of the eight DVs (see Table 5). In all five cases, the most experienced software users (four or more years of experience) indicated beliefs that were significantly different from the least experienced software users (zero to three years of experience). The most experienced software users require students to use Mastery Mode and submit CAI assignments, and believe that customization, CAI, and instructors' interactions with the software have a positive impact on students learning dictation skills. The perception that CAI has a positive impact implies that experienced CAI users trust software's ability to provide students with a personal tutor that can facilitate the acquisition of dictation skills. Longevity of using CAI increases instructors' interactions and involvement with CAI, and the perceived value of CAI. Furthermore, longevity of using software also produces seasoned CAI users who maximize the benefits of customizable software in a meaningful way to aid students in the progressive stages of acquiring aural skills. The most experienced software users also represented the largest percentage of customizing instructors.

Although the Post Hoc ANOVA did not reveal any specific interactions with years of experience in teaching aural skills (see Table 4), instructors with 10 to 15 years of teaching experience (Group C) consistently had the lowest mean responses among the other groups of instructors for the importance of requiring students to use Mastery Mode, Practice Mode, Make My Own Drills, and

requiring students to submit CAI assignments.[41] Group C had the most amount of variance from the other groups.[42] The exact reason for their unfavorable outlooks toward the software is unclear. One possible explanation is that Group C had the highest percentage (30.77%) of instructors who have discontinued using the software package. Further, Group C differed from the other groups in that these instructors represented the highest number of doctoral recipients, the highest perceived effectiveness in teaching dictation, and the most confident group of females.

While years of experience in using the selected software had a significant influence on the importance of using Mastery Mode, none of the IVs had a significant influence on the importance of using Practice Mode or Make My Own Drills. This is due to an overall favorable attitude toward Practice Mode (M = 4.66; SD = 1.39), and an overall less favorable attitude toward Make My Own Drills (M = 3.54; SD = 1.53)

Discussion of Results and Implications for Pedagogy

The following discussion serves to address concerns and themes which emerged from the data analysis. It addresses software usage practices, lack of accessible professional development, gender, graduate assistants, years of experience in teaching aural skills, and generalizability.

Software Usage Practices

In this study, aural training software is most often used as a graded requirement, implying that instructors place much confidence in the software's ability to meet out-of-class dictation needs. Although most instructors require students to submit assignments using

[41] Instructors in the sample were divided into four fairly evenly balanced groups: Group A—one to three years (n = 73), Group B—four to nine years (n = 69), Group C—10 to 15 years (n = 70), and Group D—16 to 40 years (n = 61). Mean ages for each group are: 34.4 (Group A), 39.8 (Group B), 46.4 (Group C), and 56.3 (Group D).

[42] Group C had the most amount of variance with Group D (p = .053), which nearly reached statistical significance for the importance of requiring students to use Mastery Mode. Group C also varied with Group B on the importance of using Practice Mode and Make My Own Drills, and with Group A for how often students are required to submit CAI assignments. Additionally, the least experienced group—Group A—indicated a higher average on requiring students to submit CAI assignments than the most experienced group of instructors—Group D.

Mastery Mode, respondents were more favorable toward Practice Mode than Mastery Mode. This may suggest that instructors place more value on the process of practice skills leading up to tested skills. On the other hand, possible negative student attitudes toward Mastery Mode may influence instructor perceptions.

Instructors indicated that their top pedagogical practices with CAI are checking students' statistics, counseling students on effective ways to use software, customizing the software to meet pedagogical needs, and demonstrating the various uses of the software to students. Findings suggest that the instructors who responded to this study use a guided approach rather than an unguided approach when introducing students to CAI. It stands to reason that instructors who use a guided approach in teaching students how to use CAI are less likely to produce students who have resentment or frustration toward CAI. Furthermore, these respondents are probably less likely to discontinue using CAI, though further research is necessary to study this component of the findings.

Lack of Accessible Professional Development

Results from this study suggest that available professional development training regarding the use of CAI is underutilized. Although the targeted software provides technical support and video tutorials, respondents overwhelmingly indicated that they had not used these materials, nor had they sought professional development in the use of the software. Perhaps delivery of training could be facilitated through online resources or networks of users.

A strong percentage (91.37%) of respondents either perceived that their previous student experience in using the software was not helpful in learning to teach with the software, or that they had no student experience, perhaps because some were students prior to the advent of the software program. It appears that many respondents trained themselves how to use CAI during their teaching careers, which raises curricular concerns regarding graduate preparation in technologies associated with aural training pedagogy. Ideally, students preparing to teach aural skills professionally would benefit most from curriculum integration of CAI in their aural training courses and learning how to customize CAI in their music technology courses.

The perceived ease in using CAI is a possible reason for the lack of training. Although respondents reported their own lack of training,

they rated the importance of counseling students on effective ways to use the software as a top priority in pedagogical practices. Further study is needed on accessible professional development training opportunities.

Gender

This study provides implications that males are not technologically superior to females. Males, as a whole, responded significantly higher than females in one area—perceived effectiveness of teaching dictation—yet, this area is unrelated to technology competency or involvement with CAI. Neither male dominance nor gender difference in technology competency was found among instructors who use CAI. Males were not significantly more involved with CAI than females' involvement with CAI, but were significantly lower in several areas. Instructors' interactions with CAI are perhaps most noticeable in customization and checking students' statistics because both require hands-on involvement with CAI. In customization, gender was nearly equally matched, implying gender equivalency in technology competency.

Females in this sample appear to interact differently with their students than male instructors. Significant findings imply that female instructors are more involved with CAI, have a high interest for students' success in the progressive stages of acquiring dictation skills, spend more time with students, and are likely to be instructive and relational in their interactions with students.

Graduate Assistants

Consistent with previous research, graduate assistants are used to teach aural skills courses.[43] Graduate assistantships may provide valuable learning opportunities through observation of faculty members, grading experiences, and student teaching opportunities; however, they may not necessarily allow students to become engrossed in aural training pedagogy and research, pedagogical resources, and learning how to use customizable CAI, among other topics.

The inclusion of graduate assistants may have influenced the overall results of this study. Over one-third (37.84%) of graduate assistants were not currently using the software package at the

[43]Gillespie, "Melodic Dictation," 2001; Nelson, "The College Music Society," 2002

time of the survey, implying sporadic use of CAI, which could have skewed some of the data. Further, over half (52.94%) of graduate assistants do not customize. Many who claimed to customize were most likely answering questions based on how their supervisor customizes.[44] This implies that graduate assistants lack hands-on involvement with CAI and training in using CAI.

Years of Experience in Teaching Aural Skills

Years of experience in teaching aural skills provided additional characteristics of the respondents. Group A (M = 34.4), with one to three years of postsecondary teaching experience, required students to submit CAI assignments more frequently than any other group, possibly to impart any components that they do not feel competent teaching. Group B (M = 39.8), with four to nine years of experience, found Practice Mode and Make My Own Drills more important than any other group, implying an eagerness to explore the software's ungraded modes. Interestingly, the overall sample generally had an unfavorable outlook toward Make My Own Drills. Group C (M = 46.4), with 10 to 15 years of experience, may have the ideal level of experience and confidence. Their mean age places them in the middle of their teaching careers, and this group represented the highest number of doctoral recipients. As stated earlier, this group had the least favorable outlook toward the selected software and had the highest amount of discontinued software users. The most experienced respondents—Group D (M = 56.3), with 16 to 40 years of experience—declined in perceived teaching effectiveness. A longitudinal study would be beneficial to determine software preferences of Groups A and B, understand why Group C consistently had the least positive attitudes, and study teaching effectiveness among Group D. Further research should also address how long it has been since an instructor last used the selected software in teaching.

Years of experience in teaching aural skills also influenced customization practices. In Group A, there were nearly an equal number of customizing and non-customizing instructors. Groups B, C, and D showed a gradual, continual increase in the number of customizing instructors, indicating that years of experience in

[44] When asked about customization of the software's Presets, Libraries, and default changes, common answers provided by graduate assistants included: "Not sure, my supervisor takes care of the presets"; "Not sure—I just grade"; and "I don't know."

teaching aural skills increased the likelihood of customization. Instructors in Group D were the most likely to customize their software uses. Most of these veteran instructors customize and have used the software for four or more years. Group D males rated Practice Mode higher than Group D females, which may suggest that years of experience in teaching aural skills influences males' interest in students' acquisition of dictation skills.

Generalizable Characteristics

Based on current findings, we believe that further research using similar demographic samples may produce comparable results. The following characteristics may be generalizable to samples of instructors who use other aural training software titles. In the current sample, doctoral recipients outnumbered non-doctoral recipients, and the percentage of doctoral recipients was significantly higher when compared to the CMS population of music theory/aural training instructors. It is possible that doctoral recipients are the largest educational group of aural training instructors who use CAI. In the current sample, the majority identified music theory/aural skills as their primary area of teaching responsibility. The current sample, predominantly comprised of four-year college/university instructors (81.48%), had 20.19% more music theory specialists than Anderman's survey of instructors at community colleges.[45] This may also be generalizable to the population of aural training software users. Because the piano is the most accessible instrument for in-class dictation, it seems likely that the piano is the primary instrument of many aural training instructors. In the current sample, piano was the most commonly identified primary instrument. Gender equality in customization practices was found in the current study. Further, females in the current study were more likely than males to monitor student CAI uses, counsel students in effective CAI uses, and check students' statistics. It is also possible that other aspects of CAI use (e.g., how instructors use CAI with their students; most frequently-used components, etc.) are generalizable to users of other software titles. Further research is needed to determine if instructors who use MacGAMUT are more likely to assign a grade weight for CAI work in comparison to instructors who use other software titles. We recommend a replication of this study using other software applications.

[45]Mark Alun Anderman, "Musicianship Instruction in California Community Colleges" (DMA diss., Boston University, 2011) ProQuest (UMI No. 3482464).

Recommendations for Further Research

Harmonic Dictation

It is unclear from the data analysis why the software's harmonic dictation is the least favorable component for improving dictation skills. Future research is needed to identify which settings in harmonic dictation are most frequently changed, reasons for changing default settings, and reasons for lower perceptions of improving dictation skills. Because harmonic dictation is consistently underprepared among incoming college music majors, additional research is needed to investigate whether underdeveloped skills influence instructors' perceptions of CAI's ability to improve these skills.[46] A study employing open-ended responses may provide useful information related to perceived potential problems in the design of various CAI applications, ways of meeting student deficiencies, and other variables related to harmonic dictation. While drill-and-practice and flexible-practice CAI are the most common types of aural training technology, more research is needed in interactive software that appeals to constructivists.

Graduate Training in Technology

Findings from the present study imply a lack of graduate training in technology preparation. The majority of respondents appeared to be self- or peer-taught in using CAI, consistent with previous research.[47] Current graduate assistants exhibited a lack of hands-on involvement with MacGAMUT, training in using CAI, and knowledge of how their supervisor customizes the software. The majority of graduate assistants do not customize, which provides further support for a lack of graduate training in technology. Exploring graduate training in technology is another possible avenue of investigation that is needed.

[46] Carolyn Livingston, "The Role of the Private Instrumental Teacher in Preparing Music Students for College Theory," *American Music Teacher* 31, no. 6 (1982): 14–16; Carolyn Livingston and James Ackman, "Changing Trends in Preparing for College Level Theory," *American Music Teacher* 53 (2003): 26–29.

[47] Reese and Rimington, "Music Technology," 27–32.

Foundational Assumptions Regarding Technology among Digital Natives

Foundational assumptions regarding aural training technology among current traditional-age college students is another beneficial topic to study. Future researchers should investigate digital natives' attitudes toward and preferences of aural training technology for out-of-class practice. Researchers should also explore mobile computing opportunities in aural training, and investigate interactive software options in aural training that encourage creativity beyond a flexible-practice or drill-and-practice model.

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Review of *Music Theory for Beginners*, by R. Ryan Endris

By Nicole E. DiPaolo

R. Ryan Endris's *Music Theory for Beginners*, a "Documentary Comic Book" that is part of the graphic nonfiction series published by For Beginners LLC, is rather unusual among music theory texts in that it is not specifically designed for use in the undergraduate music theory classroom.[1] As its preface states, "*Music Theory For Beginners* was developed for anyone interested in learning to read and write music….Whether your goal is to gain a cursory understanding of music, become fluent in reading music again, or start composing your own music…anyone can pick up this book and instantly start learning about—and understanding—music theory" (xi). Thus its style, design elements, and supporting materials diverge in various ways from what is normally seen in a college fundamentals textbook, though most of its content is quite standard for a fundamentals course, opening with the basics of staff notation and working up to dominant seventh chords. Endris includes some interesting additional content generally absent from fundamentals courses, such as introductions to the blues scale, octatonic and whole tone scales, and a brief survey of large-scale forms.

Among this book's distinguishing features is that it is a graphic nonfiction text, so it contains a good deal more illustrations than a traditional text. The illustrations, by Joe Lee, are whimsical and witty black-and-white sketches, often depicting Beethoven with a few other composer cameos; almost all refer indirectly to concepts presented in the text on that page but do not themselves deliver essential content. Example 1 shows two illustrations reprinted from pages 14 and 25, respectively.

[1] R. Ryan Endris, *Music Theory for Beginners* (Danbury, CT: For Beginners, 2015).

Example 1.a. Illustration from Chapter 2: Meter, The Framework for Rhythm, p.14

Example 1.b. Illustration from Chapter 3: Notation Pitch (and What Pitch Is), p. 25. Both illustrations are reprinted with permission from *Music Theory For Beginners*, by R. Ryan Endris, illustrated by Joe Lee, For Beginners LLC, Danbury, CT, © 2015.

Alongside the main text, each chapter includes a number of historical asides in grey boxes, ranging from background information on various composers to helpful hints that solidify the concepts being taught. Important terms appear in boldface and italics throughout the text. Additionally, while the book does not explicitly aim to teach aural skills, Endris often invokes the readers' listening experiences directly and asks them to seek out a particular piece, calling attention to one or more of the ideas being discussed.

This book's unique layout, of course, obliges some compromises. In the interest of concision, some topics are not explored in as much depth as they would be in a traditional text; for example, the notation chapter does not cover more advanced aspects of notation (such as note values smaller than 16th notes and C clefs). Endris presents many terms and definitions in a sentence or two, and only a single graphic or musical example accompanies the majority of concepts presented. In addition, no exercises are included as part of the text. Overall, the text is divided into five units, with two or three chapters per unit.

UNIT I: Rhythm, Beat, Tempo, and Meter

Chapters 1 and 2 provide a thorough grounding in rhythmic and metrical notation. Following a relatively lengthy background discussion on rhythm, tempo, and beat, Chapter 1: The Building Blocks of Rhythm, dedicates a very brief two pages to presenting the various note values and their rests, ranging from whole notes to sixteenths. Chapter 2: Meter, the Framework for Rhythm, covers both simple and compound meters, time signatures, bar lines, syncopation, and ties. (A small typo, however, appears on page 10: simple meters divide the princi*pal* beat, not the princi*ple* beat, into two.) Again, the concepts are presented quickly and succinctly, ideal for review or for a strong student.

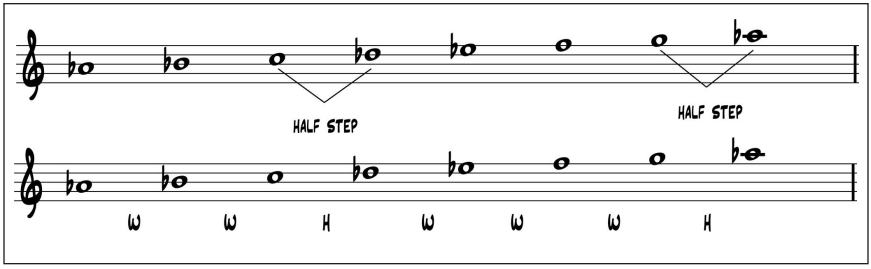
UNIT II: Musical Notation

Chapter 3: Notating Pitch (and What Pitch Is), dives into staff notation, initially setting aside rhythm to focus on pitch. Endris relates the letter names, as well as whole and half steps, to positions on the keyboard (as in figure 3.3). Some instructors might consider this a crutch; however, particularly for singers who cannot visualize pitch relations on their own instruments, a visual aid like

the keyboard can be enormously helpful in developing written and aural skills. Accidentals, enharmonics, and intervals are also defined briefly; the last two pages then introduce the treble and bass clefs as well as ledger lines. C clefs do not appear in this chapter, so a student preparing for placement exams or graduate work in music would need to make a note of this and find other sources for C clef practice. Chapter 4: The Evolution of Musical Notation, steps away from fundamentals to provide a historical overview of music notation from its development in ancient Greece through the Middle Ages. At seven and a half pages long, it constitutes a brief survey, but its mention of Pythagorean tuning, neumes, and mensural notation (among other ideas) invites interested readers to explore these concepts in greater detail.

UNIT III: Scales and Keys

Chapter 5: Major Scales and Keys, will be the most logical starting point for readers already conversant with notation. The chromatic scale is introduced first, and the discussion quickly moves to major scales, for which Endris emphasizes the importance of semitones and their locations within the scale, again with the keyboard as a visual aid. A discussion of key signatures and their function flows organically, for example, as when Endris demonstrates how one must add four flats to preserve the pattern of whole and half steps in the A-flat major scale as reflected in his figure 5.5 (see Example 2).



Example 2. Building an A-flat major scale; figure 5.5, page 44, reprinted with permission from *Music Theory For Beginners*, by R. Ryan Endris, Illustrated by Joe Lee, For Beginners LLC, Danbury, CT. © 2015

The rest of the chapter is devoted to key signatures and the circle of fifths. Endris includes the best-known "tricks" for identifying major key signatures (that the last sharp is always the leading tone and the penultimate flat is always the tonic), a valuable addition because these "shortcuts" encourage analytical understanding over rote memorization.

Chapter 6: Minor Scales and Keys, defines relative and parallel major/minor relationships while introducing scale degrees. The rest of the chapter discusses each form of the minor scale, concluding with a very important observation, one often lost in traditional fundamentals pedagogy: "[Natural, harmonic, and melodic] are just that—variants of a single minor scale" (57). Chapter 7: More Scales, diverges a bit from a traditional fundamentals text in that it introduces the major and minor pentatonic scales, the blues scale, the whole-tone scale, and octatonic scales.[2] Again, Endris privileges intervallic content as a means of identifying these scales. Interested readers will find plenty of material to explore further, as this chapter's historical asides point to a number of composers and genres including Tchaikovsky, Ravel, Debussy, Stravinsky, and New Orleans jazz.

UNIT IV: Intervals and Harmony

Chapter 8: Intervals, first defines interval types and then lists them by the number of semitones they span. Acknowledging that counting half-steps is unwieldy for larger intervals, Endris then demonstrates how diatonic intervals relate back to the tonic within the major scale. This chapter also defines compound versus simple intervals and includes a chart of all simple intervals and their inversions. Chapter 9: Sweet, Sweet Harmony, moves immediately into triads, their qualities within the major and minor scales, inversions, and Roman numeral labeling. A small detail, but one that I appreciate, is that all but the last example in this chapter are given in keys other than C major. The last two pages of this chapter discuss dominant 7th chords. Curiously, Endris stops here with the topic of 7th chords, noting in the chapter's last paragraph that many

[2] Unlike most theory texts, which identify three octatonic scales based on pitch class content, Endris categorizes octatonic scales into two categories: those that begin with a half step, and those that begin with a whole step. Unfortunately, incorrect notation in Example 7.7 obscures this definition.

other types of 7th chords exist but are beyond the scope of the book. Given that most fundamentals classes also include major-major, minor-minor, diminished, and half-diminished 7th chords, it might be helpful to expand Chapter 9 into two new chapters and include all the common types of 7th chords in the latter one.

UNIT V: Putting (Music) Theory into Practice

The book's final unit, spanning chapters 10–12, touches on the concepts of tonality and tonal syntax, melodic motion, and larger forms. Chapter 10: Writing Harmonies, does not actually ask the student to write a progression; instead, it opens by discussing, at some length, the idea of tonality and how tonic and dominant functions interact within it. Endris illustrates this with "Mary Had a Little Lamb." Most impressively, at the end of the chapter, Endris includes two versions of something similar to Laitz's Phrase Model, outlining the typical order of diatonic harmonies within a progression.[3] Enris's version doesn't include multi-chord prolongations or expansions as Laitz's does; nonetheless, Enris's version should be enormously useful for songwriters and anyone else composing in a tonal language.

Chapter 11: Writing Melodies, is comparatively brief, but it introduces some important topics, including range, tessitura, conjunct/disjunct motion, and motive. Endris loads more weight onto the final chapter—Chapter 12: The Syntax of Music—covering a nearly dizzying array of terms: cadence types, period structures, binary and ternary forms, and most ambitiously, sonata form (a topic many fundamentals courses will not touch). It is most likely that readers will find themselves needing to spend much more time with this chapter than with those in the earlier units. During the discussion of half cadences, Endris quite nicely reintegrates Ch. 10's "Mary Had a Little Lamb" example. Within the rest of the chapter, I would have liked to see a musical example for period structure as well and references to specific pieces—if space limitations prevented the inclusion of actual examples—that employ unambiguous binary, ternary, rounded binary, and sonata designs.

[3] Steven G. Laitz, *The Complete Musician: An Integrated Approach to Tonal Theory, Analysis, and Listening*, 4th ed. (New York: Oxford University Press, 2015), 273ff.

Impressions and Potential Audiences

In some ways, I found *Music Theory for Beginners* difficult to evaluate, given that I am more accustomed to classroom teaching and systematic tutoring and, of course, this book is not designed for that environment. With that in mind, I believe this text accomplishes exactly what it has set out to do: provide an overview of the important concepts within rudimentary music theory in a concise and approachable manner. Its concision and engaging style are clear strengths. In addition, the numerous historical tidbits and nonstandard concepts (like the various scales in chapter 7) invite further research by providing just enough information to pique readers' interest. Popular music is referenced throughout the book, which allows the text to engage a wider variety of musicians than a standard text might. The illustrations are entertaining and the glossary is handy enough to find a place in many a first-year music student's exam notes.

Independent readers who desire further reinforcement or practice with a particular concept will need to consult alternative sources, some limited suggestions for which Endris helpfully lists under in a Further Reading section (starting on page 115). Another potential disadvantage for anyone studying music theory without an instructor (with this book or otherwise) is that aural skills development usually falls by the wayside. While Endris often urges readers to seek out and listen to specific pieces or passages, and most examples are laid out so that they can be played through easily at the piano, students with less developed audiation skills (or keyboard skills) may require more drilling before they can master all the content in the later chapters. One possible solution—not sacrificing the book's appealing brevity—would be to build a companion website with additional examples, which might include audio and perhaps some interactive skill-building games.

As with each of the numerous volumes in the *For Beginners* series (including a second volume authored by Endris, *The History of Classical Music for Beginners*), this text is aimed at lay readers rather than college-level music majors. For such an audience of lay readers, traditional college textbooks—even a fundamentals text that assumes no previous knowledge—may not be ideal, since these texts tend to rely more on classroom-based group exercises, graded homework assignments, and bullet-point lists that lend themselves more readily to PowerPoint presentations than to

prose. Endris's conversational, yet intelligent, delivery seems more navigable for the interested reader who does not have an entire semester to devote to studying introductory music theory in a formal classroom setting. As such, one potential market for this text is the recreational adult student of piano or another instrument. The often childish "piano theory" workbooks bundled into most mainstream piano methods do not always connect with teenage and adult students, but some of the better-known college textbooks (such as the otherwise excellent Aldwell/Schachter and Laitz texts) tend to be too dense and comprehensive for their needs.[4] (Laitz, for example, covers almost everything in Endris's book within the first six out of thirty-seven chapters. The Laitz text's sheer size and scope are its strengths in the standard theory classroom, allowing students to profit from it for several semesters; however, it could easily overwhelm a recreational reader or someone who simply lacks the time to work through thirty-seven chapters.) Additionally, *Music Theory for Beginners* may appeal to the incoming graduate student or former music student in need of a quick refresher on the basics. Outside of the academy, this book would be a welcome addition to church music libraries, particularly those who recruit choristers from the community and may be working with widely divergent levels of music literacy. Instrumental and vocal music instructors seeking to refresh their own theory knowledge quickly would benefit from this text as well, particularly if they find themselves needing to prepare students for the MTNA, RCM or ABRSM written theory assessments. High school-age musicians looking toward university/conservatory degrees in music, or even simply AP Music Theory, will also find this book a manageable and even enjoyable summer read.

Though it is not intended to be a classroom-ready text, it is certainly possible that some instructors might find this book's concision appealing for the purposes of a brief survey, perhaps in the non-major or musical theatre major theory classroom. Should Endris and the publisher choose to build a companion website with additional examples, exercises, links to audio recordings, and the like, this book could gain even greater utility within the classroom setting.

[4] Edward Aldwell and Carl Schachter, *Harmony and Voice Leading*, 4th ed. (New York: Schirmer, 2010); Laitz, *The Complete Musician*.

Conclusion

Music Theory for Beginners is an excellent resource for the amateur or student musician seeking a quick, pedagogically sound review of written music theory basics. This book occupies an important market niche. It does not claim to take the place of a comprehensive traditional undergraduate theory text in the vein of Laitz, Kostka/Payne/Almén or Aldwell/Schachter; nor is it as thorough in its treatment of each topic as a classroom-ready fundamentals text like the one by Straus, with its thirty-five lessons and five self-tests.[5] Instead, Endris's book taps into a more diverse market with which few music scholars have engaged. Instructors who often work with nontraditional students or teach outside the music theory classroom will welcome this nontraditional text.

[5] Laitz, *The Complete Musician*; Stefan Kostka, Dorothy Payne, and Byron Almén, *Tonal Harmony*, 7th edition (New York: McGraw-Hill, 2013); Aldwell and Schachter, *Harmony and Voice Leading*; Joseph N. Straus, *Elements of Music*, 3rd edition (New York: Pearson, 2012).

Contributors

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Victoria Chen is a PhD Candidate in the Faculty of Education with a keen interest in enhancing students' learning experiences in higher education in order to better prepare them for their professional careers. Her current research has primarily focused on how physical space and learning technology, particularly the Active Learning Classrooms, can foster positive learning environments and experiences for students that will help them in their future endeavors.

Richard Cohn is the Battell Professor of Music Theory at Yale University. He was the founding editor of Oxford Studies in Music Theory, and currently serves as the Executive Editor of the *Journal of Music Theory*.

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Jay Dorfman is an Assistant Professor in Music Education at Boston University where he teaches courses in technology-based and instrumental music and graduate research. He is the author of *Theory and Practice of Technology-based Music Instruction* (Oxford University Press, 2013), a widely used resource on the design and implementation of technology in the K-12 music classroom. He holds degrees in music education from the University of Miami (BM, MM) and Northwestern University (PhD). In the fall of 2016, Dr. Dorfman will begin a position as Associate Professor and Coordinator of Music Education at Kent State University.

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Brenda Ravenscroft is Associate Professor of Music Theory in the Dan School of Drama and Music and Associate Dean of Teaching and Learning in the Faculty of Arts and Science at Queen's University. She is currently co-editing a four-volume series, *Analytical Essays on Music by Women Composers*, the first of which was published by Oxford University Press in March 2016. In her role as Associate Dean she is responsible for teaching and learning initiatives, curriculum development, and quality enhancement across the faculty. Since 2011 she has been leading a large-scale project to transform high-enrollment introductory courses into flipped versions to enhance student engagement.

Guidelines for Contributors

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

Manuscripts should be submitted via the JMTP Submissions link at https://music.appstate.edu/about/music-theory-pedagogy-online/jmtp-submissions. Submissions should be in Microsoft Word or PDF format, use 12-point type and be double spaced (including footnotes, references and quotations), with at least one-inch margins. Footnotes, tables, figures, musical examples, and other materials should be inline with the text. Long musical examples and complex diagrams or charts should be avoided when possible.

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.

Upon acceptance for publication, the following will apply:

- Authors may be required to revise the article to fit the style guidelines of the journal (*Chicago Manual of Style*). Authors will be asked to provide a brief biography and a one-paragraph abstract summarizing the article's content.
- The author is responsible for obtaining permission to reproduce copyrighted material and for paying permission fees, if necessary. Permissions must accompany the submission of accepted manuscripts.
- 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 as separate files (PDF format).

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