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]

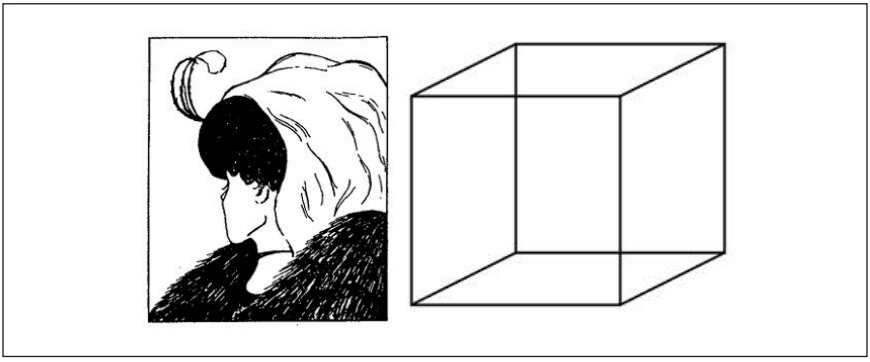
[17] Thomas Benjamin, *The Craft of Tonal Counterpoint*, 2nd ed. (New York: Routledge, 2003), 30–32.

[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

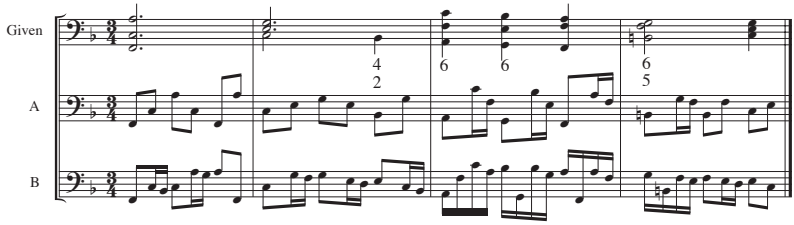
[21] This explanation of ambiguity and these visual analogies help to reorient students who enter with a straightforward view of analysis toward an analytical process that is—suddenly for many of them—far more up for grabs. William Perry's model of intellectual development helps to account for students 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.

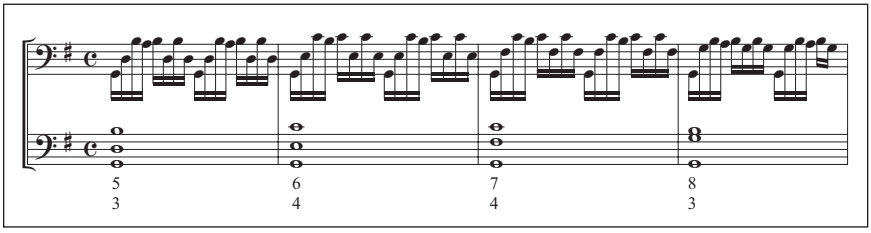
Exercises A and B

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).

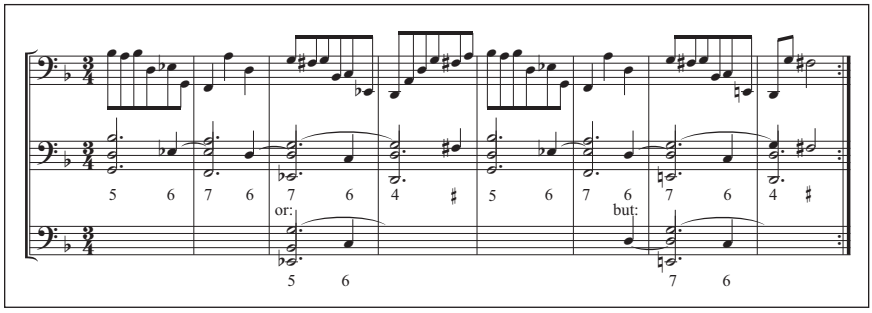
The well-known opening of the Prelude from Bach's Cello Suite in G Major (Example 3) models the simplicity targeted in Exercises A–B. The wide spacing between the three implied voices helps students to hear each of them distinctly; the appearance of the bass voice first within each measure and its long 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

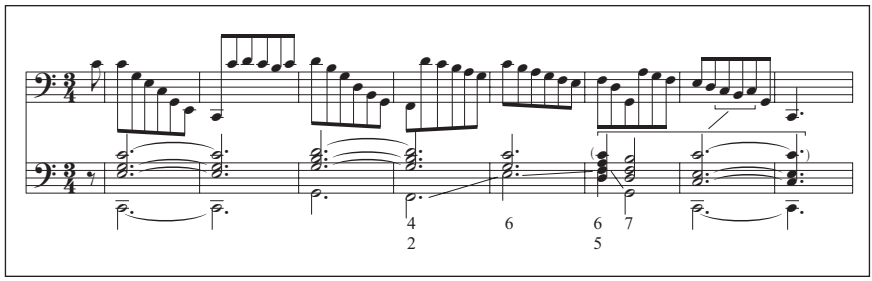
The same passage also supports discussion of implied suspensions in preparation for Exercise D. The 7–6 suspensions in m. 2 and m. 6, and in m. 3 and m. 7, are obligatory in order to avoid parallel fifths between the two upper voices. The former are simpler, requiring the retention of the preceding E♭ 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.

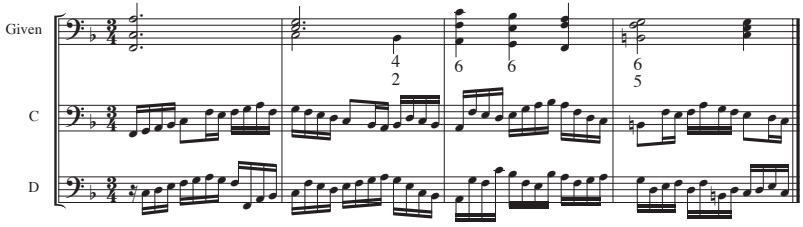


Example 5. J. S. Bach, Suite No. 3 in C Major for Solo Cello, Courante, mm. 1–8

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.

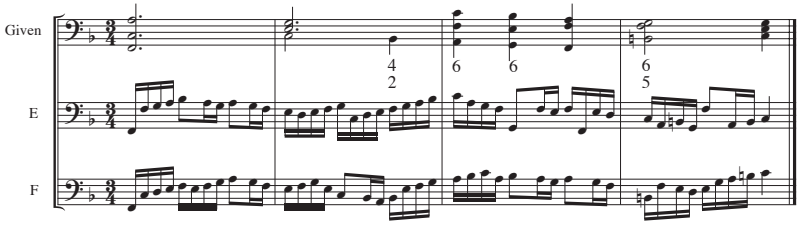
[27] A performer can get this moment wrong as well, I think, by hammering the F2 in m. 4, giving no special emphasis to the downbeat of m. 6, and then again hammering the G2 in m. 6.

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.)



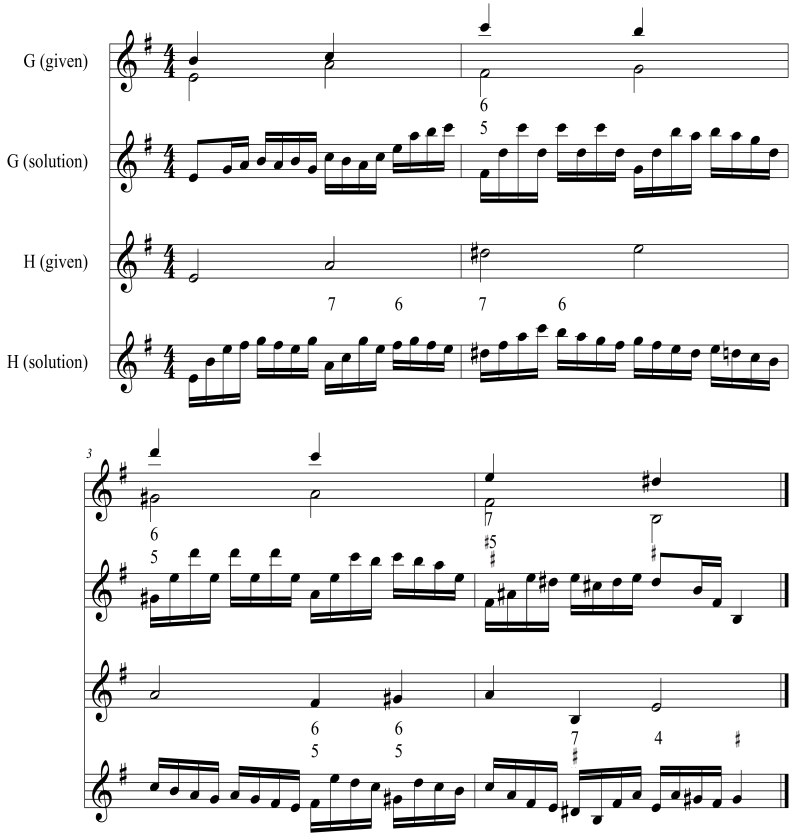
Instructions for Exercise E: Weave intermittently among the given contrapuntal voices, making some explicit while leaving others implied, such that the same voices are not present in each harmony.

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

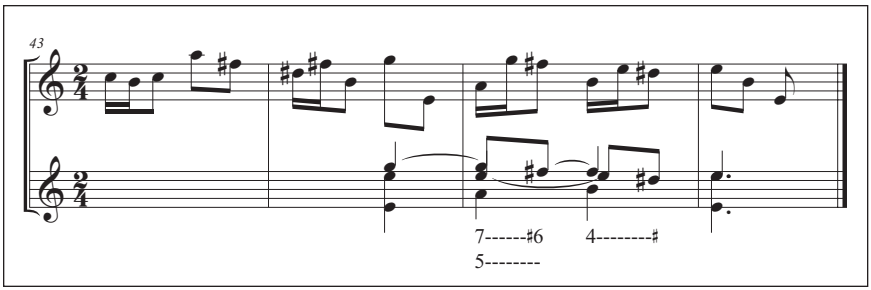
The Literalist and the Archaeologist

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.

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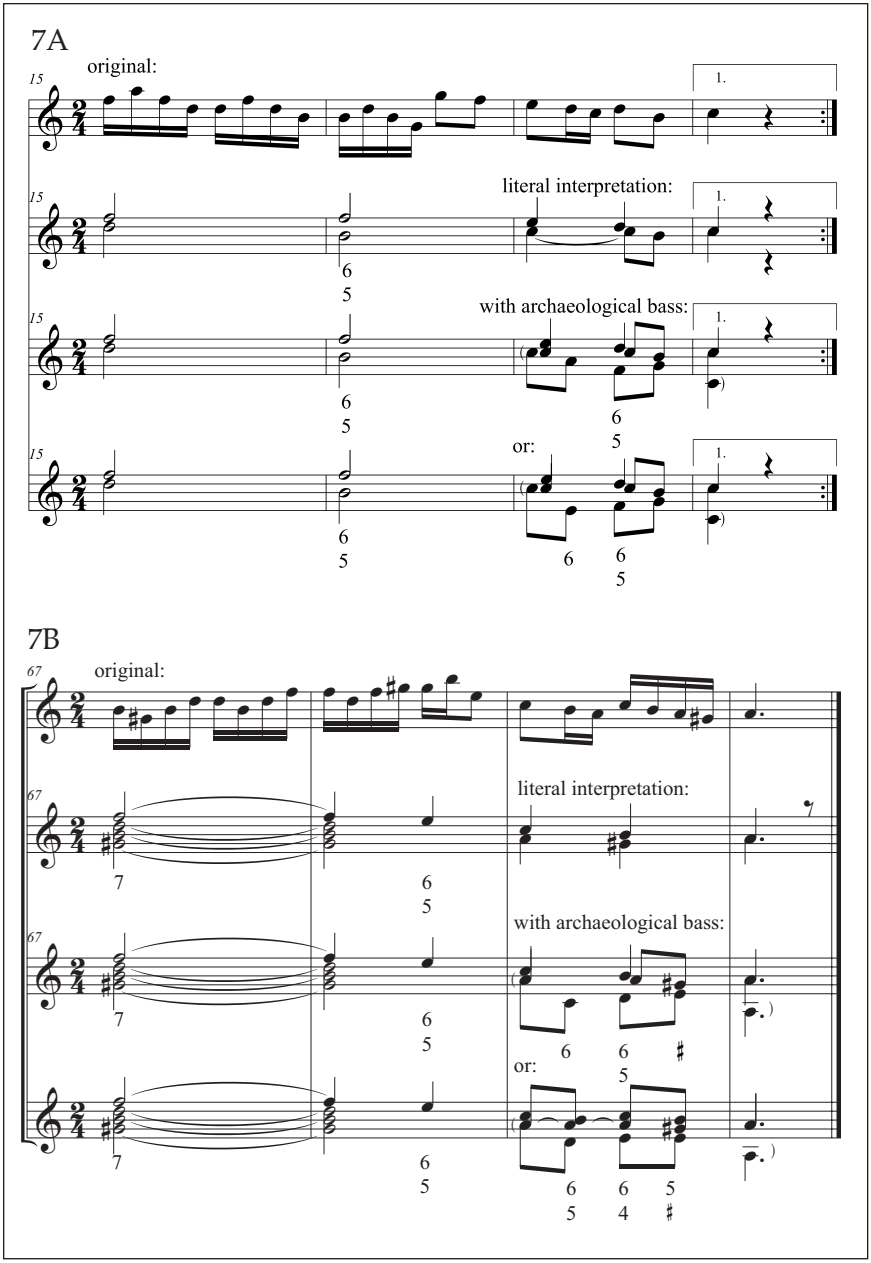
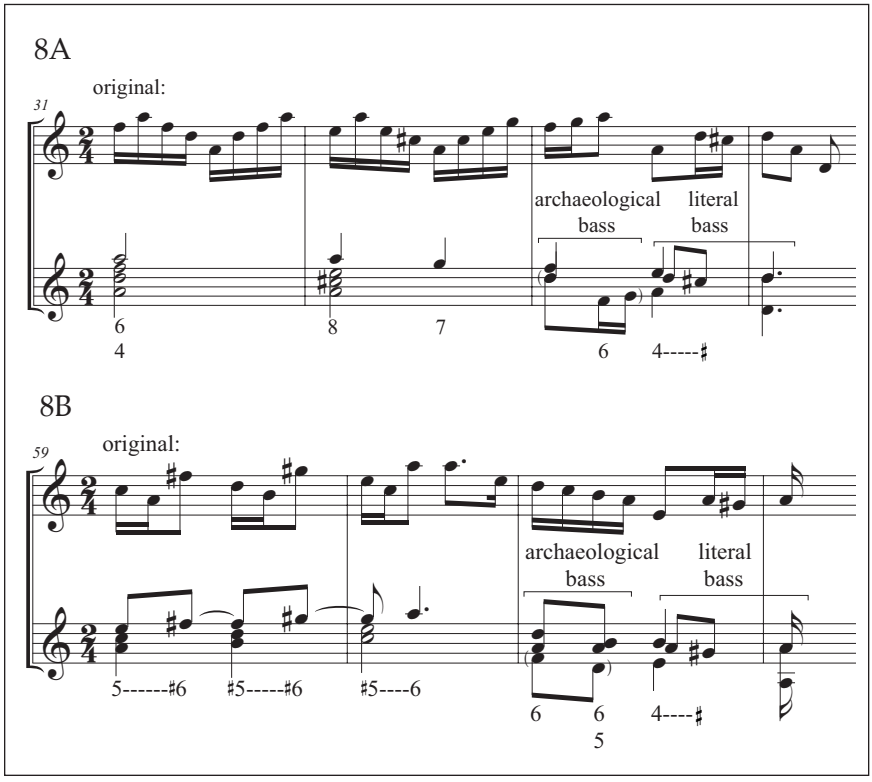
the original versions (using recordings and/or in-class performances by students) and the archaeological or literal interpretations of them—that is, alternating between what *sounds* and what I am asking students to *hear*. Students then reflect on whether they listen differently to the unaccompanied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



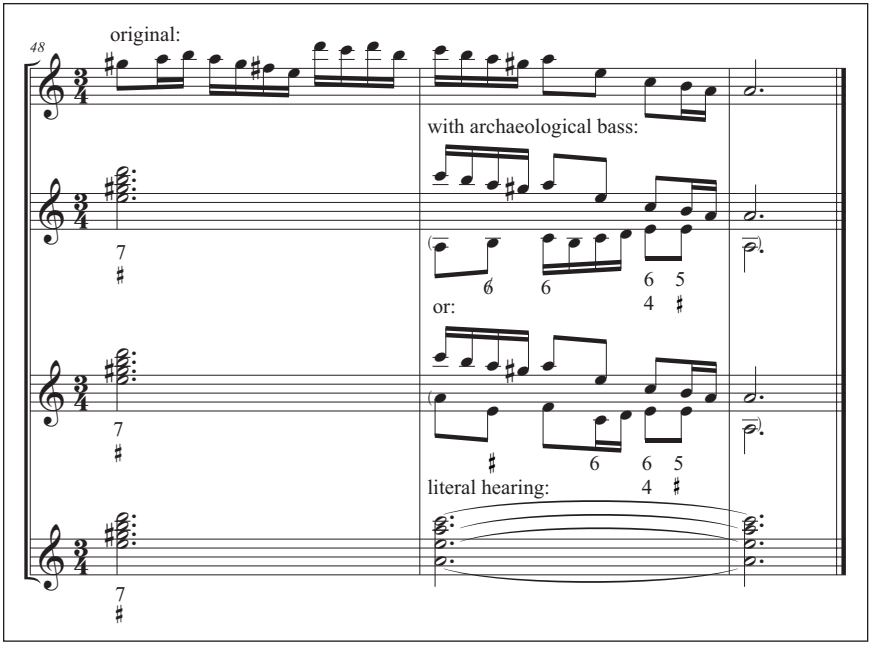
Examples 8A and 8B. Partially accompanied cadences: Partita in A Minor for Solo Flute, Bourrée Anglaise, mm. 31–34 and 59–62, with mixed archaeological and literal hearings

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.

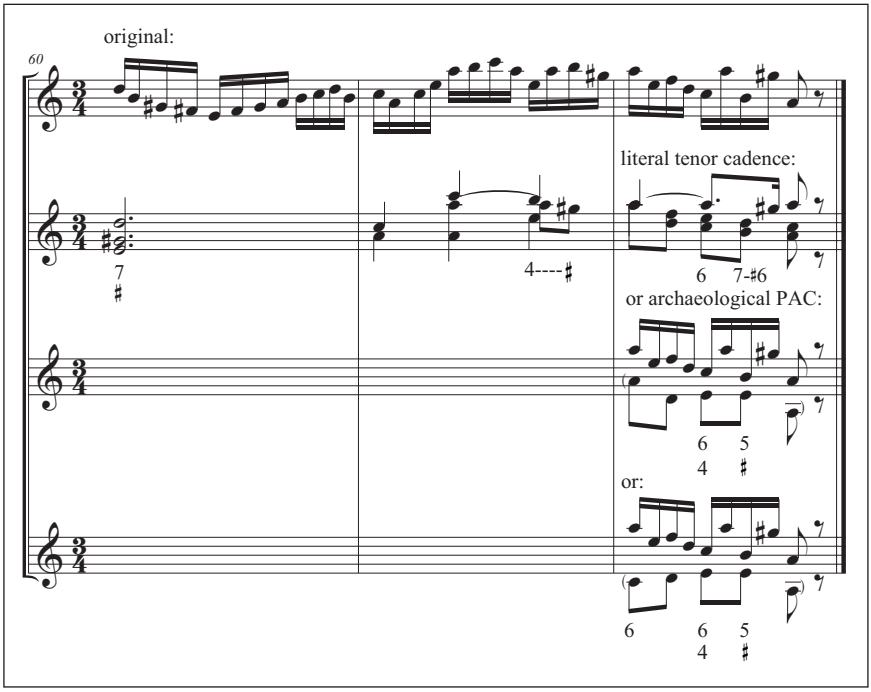


Example 9. Elective hearings: Partita in A minor for solo flute, Sarabande, mm. 48–50, heard either literally (lowest staff) or archaeologically (middle staves)

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.



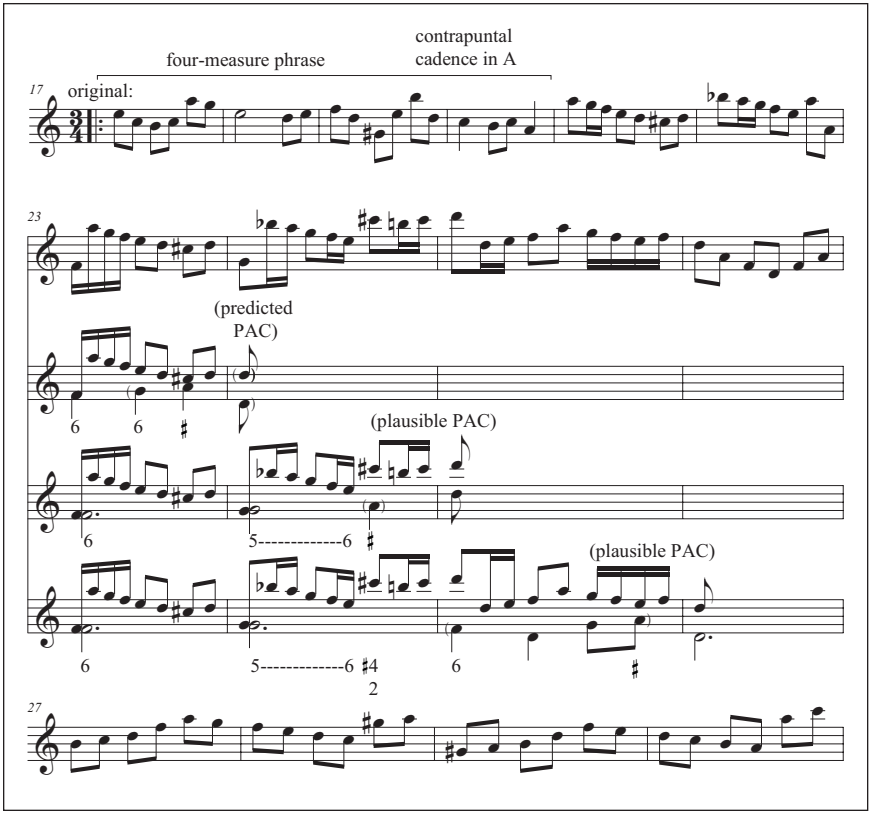
Example 10. Three elective hearings of Partita in A Minor for Solo Flute, Corrente, mm. 60–62: one literal (second staff) and two archaeological (lowest staves)

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.

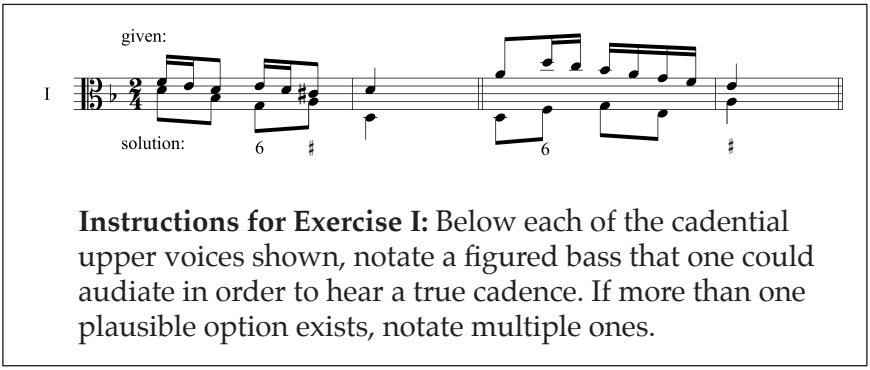
The context does little to arbitrate between m. 25 and m. 26 as potential cadential arrivals; these would create nine- and ten-measure units, respectively, since the start of the second reprise, and, although the rhythmic shift in m. 26 may suggest the beginning of a new phrase, the two-measure sequential 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

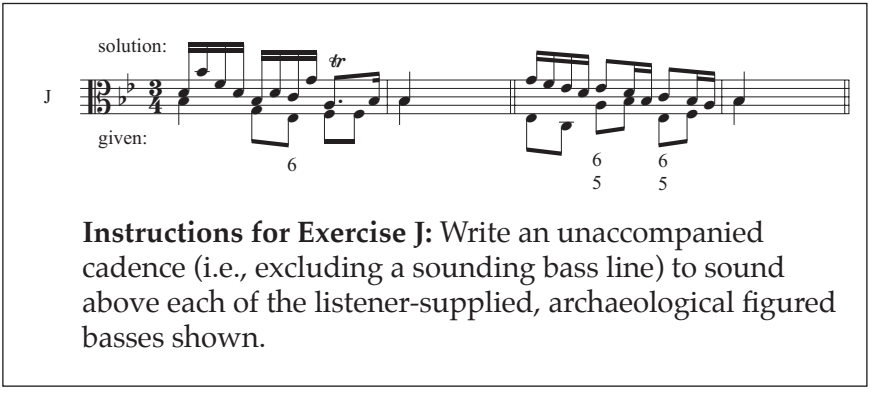
[35] This article presents only written homework, limited to a select few representative examples in order to demonstrate the approach. However, about half of the compositional homework that students complete for the counterpoint course is submitted through music making rather than on paper; they play 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.

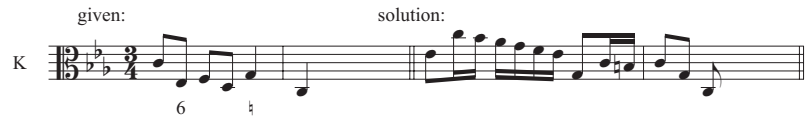
Exercise I



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

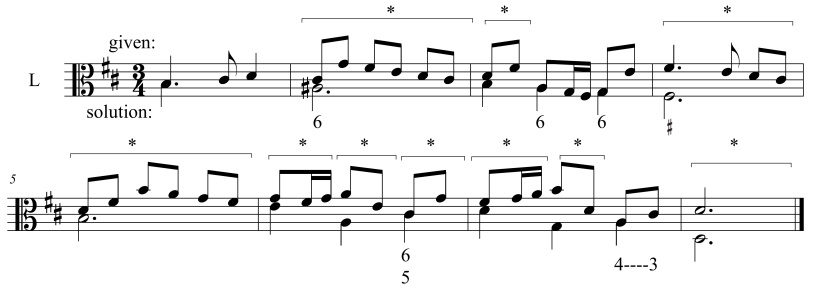
Moving away from just cadences, Exercise L is an aural-analytical exercise in the guise of a compositional task; it instructs students to "compose" an audiated bass line underneath a longer passage that includes some bass notes and omits others. Considering the surrounding context of bass notes that *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

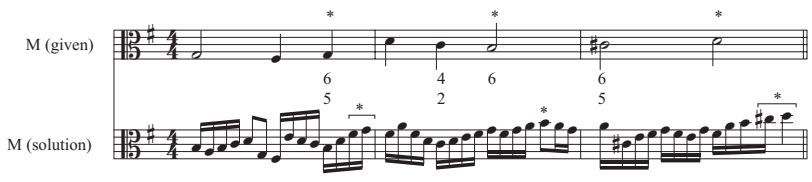


Instructions for Exercise L: In the following passage, several bass notes are implied without actually sounding. At each asterisk, notate a figured bass pitch that you find convincing to audiate underneath what sounds. If you can imagine more than one possibility, show the alternatives. Where there is 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.

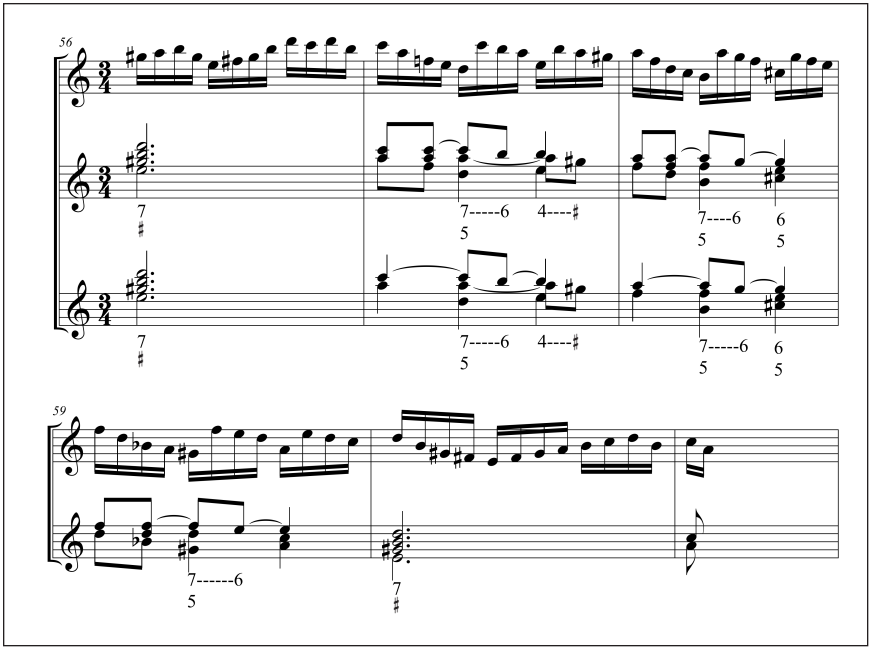
Exercise M

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 $ii^{\varnothing 6}_{5}$ 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 $ii^{\varnothing 6}_{5}$, 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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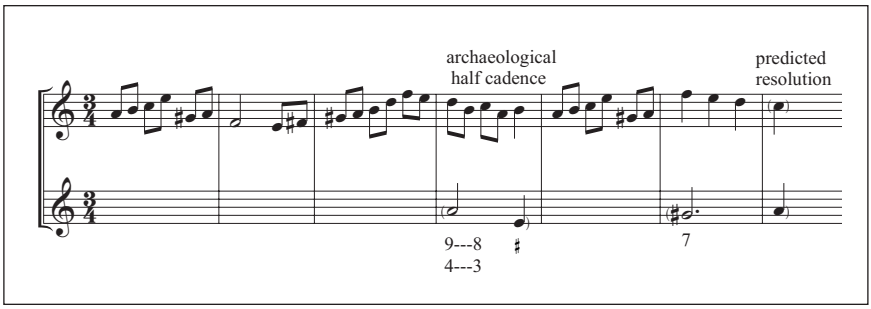
than vague, supporting clearly defined contrapuntal hearings rather than occupying a blurry middle territory, I find that certain performance decisions make it possible to experience something *like* contrapuntal vagueness on the first beats of m. 57 and m. 58. At a fast enough tempo, and with sufficiently 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.

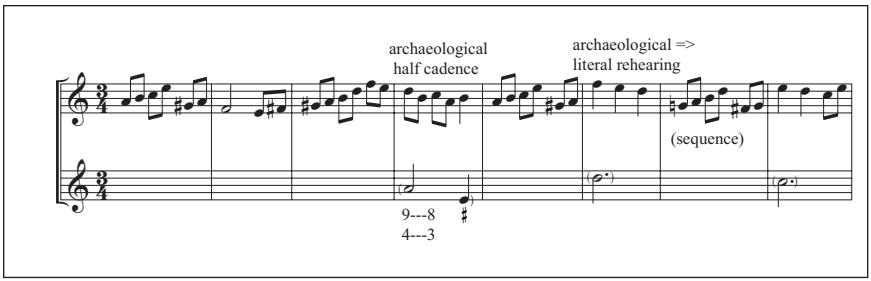
[39] Huron, *Sweet Anticipation*, 229.



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).



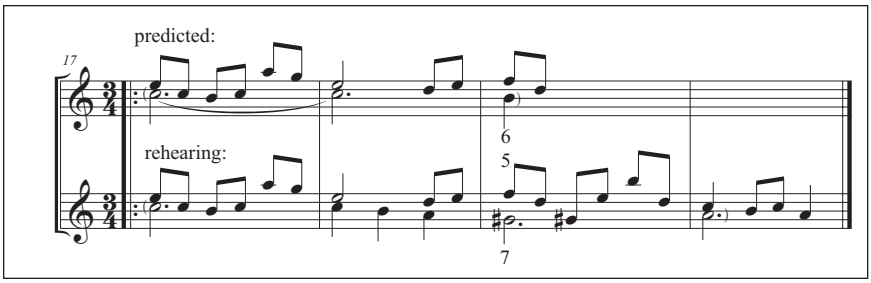
Example 14. Partita in A Minor for Solo Flute, Sarabande, mm. 1–8, with revised literal hearing of m. 6

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

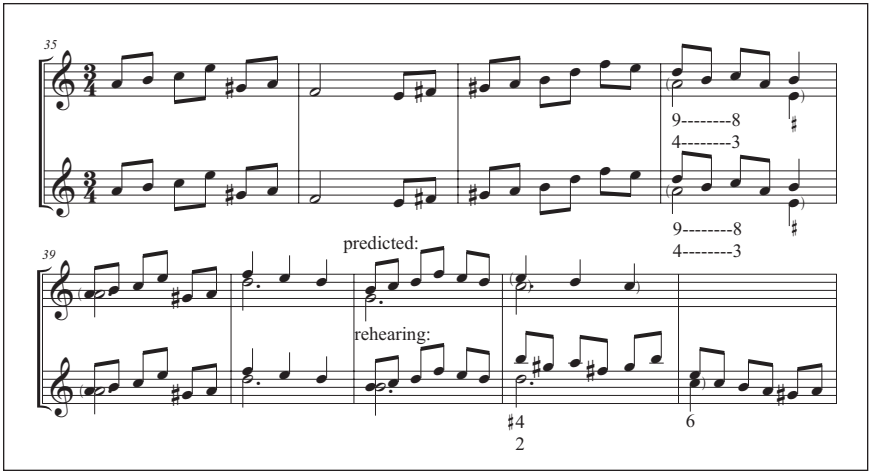
[41] Steve Larson, *Musical Forces: Motion, Metaphor, and Meaning in Music* (Bloomington: Indiana University Press, 2012), 2.

[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.



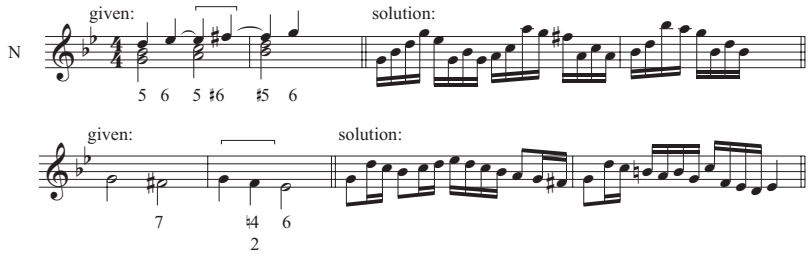
Example 16. Partita in A Minor for Solo Flute, Sarabande, mm. 35–43, with hearing of descending-fifths sequence as in mm. 5–8 (upper staff) and compulsory revision to stay in tonic (lower staff)

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.

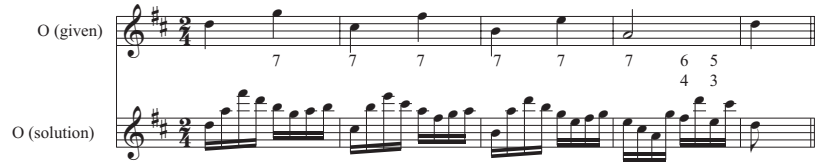
Finally, Exercise P deals with the kind of ambiguity discussed earlier in this section, in which asynchrony allows an audiated (i.e., archaeological) bass to conflict with one or more pitches that do sound, but arrive late. The task is modeled quite closely after the opening of the Sarabande, discussed 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.



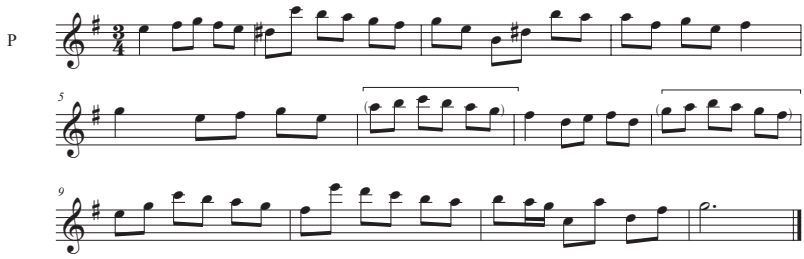
Instructions for Exercise N: Realize the given contrapuntal progressions solo-polyphonically. Each contains an instance of either direct chromaticism or an undesirable melodic interval, marked with brackets. Take advantage of the asynchrony to smooth these out.

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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