Composition Lessons with Bach

Kevin Korsyn

J. S. Bach's unfinished Air with Variations in C Minor BWV 991, from the 1722 *Clavierbüchlein für Anna Magdalena Bach*, consists of a sixteen-measure binary theme with two variations, all in different stages of incompleteness. Some scholars believe this fragmentary state was intentional, especially since the variations follow another unfinished work, the Fantasia in C Major BWV 573, in the manuscript. According to Peter Williams, "there does seem to be a teaching program of sorts here … four various 'cues' or 'models' for the student to continue."[1]

Whether or not Bach designed BWV 991 as a set of compositional exercises, it works well for this purpose. Here I will focus on the first variation (mm. 17–32), which consists of a single melodic line with no other voices, using it as the basis for a progressive series of projects in composition or improvisation suitable for an undergraduate course in eighteenth-century counterpoint. In project 1, students add a bass line entirely in eighth notes below the cantus firmus, while in project 2 they add a bass in constant sixteenth notes; these two assignments provide a transition from work students may have done in strict species counterpoint in the Fux tradition to more free types of composition. Project 3 is designed to sound more like "real" music, since students add two voices in free rhythms under the cantus firmus. All three tasks complement previous training in figured bass. Instead of working upward from a given bass, now they work from a given upper voice. The music for variation 1 is shown in example 1; I have renumbered the measures as 1–16 and will refer to this as the cantus firmus.[2] Since the cantus firmus has two sections, an instructor could subdivide all three projects into two parts, so that students can get feedback after doing half the exercise.

Why choose this as the basis for counterpoint projects? The most obvious answer is that if Williams is correct—and I think he is—Bach himself sanctioned it as a task for his students to complete. Even if this is true, however, one must still ask what Bach might have expected his students to learn by completing this fragment. I suspect the melody

[1] *Bach: A Musical Biography* (Cambridge: Cambridge University Press, 2016), 596.

[2] All examples can be found at the end of the article, starting on p. 238.

was used because its varied rhythms and intervals pose a number of contrapuntal challenges within a relatively compact space. At the same time, however, there is an element of arbitrariness in any decision about what to include or omit in any curriculum, and there are probably dozens of other melodies that would work equally well.

My pedagogical methods in this essay are eclectic, synthesizing a variety of models and sources, including some that would have been familiar to Bach, as well as more current approaches involving schemata, formal functions, and the recent revival of the partimento tradition.[3] Thomas Attwood's records of his studies with Mozart also provided an important inspiration for projects 1 and 2. Mozart assigned an eight-measure melody to use for a series of exercises in writing bass diminutions; before Attwood was allowed to add any inner voices, he had to compose a series of increasingly intricate bass lines, starting with a skeletal line in mostly quarter notes, then doing one in constant eighth notes, and finally one in constant sixteenth notes. In my classes, I have found it helpful to discuss Mozart's meticulous corrections of Attwood's bass lines with students working on the Bach cantus firmus, despite some obvious stylistic differences between the two melodies.[4] The oral nature

[3] One source that would have been known to Bach is Friedrich Erhard Niedt, *Musicalische Handleitung*, 3 vols. (Hamburg, 1700, 1706, 1717, rev. ed. by Johann Mattheson, Hamburg, 1722; reprint, Buren: Frits Knuf, 1976); trans. Pamela Poulin and Irmgard Taylor as *The Musical Guide* (Oxford: Clarendon Press, 1989). Recent scholarly work on the partimento tradition includes Giorgio Sanguinetti, *The Art of Partimento: History, Theory, and Practice* (New York: Oxford University Press, 2012); Peter van Tour, *Counterpoint and Partimento: Methods of Teaching Composition in Late Eighteenth-Century Naples* (Uppsala: University of Uppsala, 2015); Thomas Christensen, Robert Gjerdingen, and Giorgio Sanguinetti, *Partimento and Continuo Playing in Theory and Practice* (Leuven: Leuven University Press, 2010); and Vasili Byros, "Prelude on a Partimento: Invention in the Compositional Pedagogy of the German States in the Time of J. S. Bach," *Music Theory Online* 21, no. 3 (2015). On the use of chorales in Bach's pedagogy, see Derek Remeš, "J. S. Bach's Chorales: Reconstructing Eighteenth-Century German Figured-Bass Pedagogy in Light of a New Source," *Theory & Practice* 42 (2017): 29–53; and Robin A. Leaver and Derek Remeš, "J. S. Bach's Chorale-Based Pedagogy: Origins and Continuity," *BACH: Journal of the Riemenschneider Bach Institute* 48, no. 2 and 49, no. 1 (2018): 116–50. On schemata, see Robert Gjerdingen, *Music in the Galant Style* (New York: Oxford University Press, 2007); and Gilad Rabinovitch and Johnandrew Slonimski, "Towards a Galant Pedagogy: Partimenti and Schemata as Tools in the Pedagogy of Eighteenth-Century Style Improvisation," *Music Theory Online* 2, no. 3 (2015).

[4] *W. A. Mozart: Neue Ausgabe sämtlicher Werke, X Supplement 3/301: Thomas Attwoods Theorie- und Kompositionsstudien bei Mozart*, ed. Daniel Heartz and Alfred Mann (Kassel: Bärenreiter, 1969), 175–80.

of contrapuntal pedagogy has left many gaps in the record. Mozart's criteria for evaluating Attwood's solutions, for example, are clear; less clear, however, are the instructions he might have given Attwood on how to create those solutions. My pedagogy here is an attempt to fill in those gaps in the oral record, while also preparing students for the more complex tasks of project 3.

Project 1: Add a Bass in Eighth Notes below the Cantus Firmus

Since "know thy cantus firmus" is the first commandment of working with given material, students should start by listening to and singing the theme until they know it by memory. Then they should analyze its structure, including its cadences, phrase structure, and voice leading, and they should be especially alert to the harmonic implications of its melodic idioms. After writing the cantus firmus on the blackboard, I generally lead a discussion to identify its structural features in a more or less hierarchical order, starting with the most significant cadences. The last two measures invoke a melodic formula with strong cadential implications, implying a perfect authentic cadence. Bach uses this same formula in a number of pieces, including the Fantasia on a Rondo in C Minor BWV 918, mm. 12–13, where it even appears in the same key. Another cadential formula appears in mm. 7–8 of the cantus firmus, which implies a Phrygian cadence; the same formula appears at the corresponding point of the Air that provides the theme for BWV 991, except that it includes signs for two additional ornaments. Although an imperfect authentic cadence in E-flat major might also work in mm. 7–8, I will later explain how the context of the whole theme makes the Phrygian cadence more desirable. The different degrees of closure produced by the two cadences create the binary structure, establishing the two sections as phrases, as coherent units that make sense when repeated. The two phrases display a number of structural parallelisms that establish a period with an antecedent and a consequent phrase. Theorists often compare the relationship of antecedent and consequent to a question and answer, and that is the case here, with the first phrase ending on a dominant and the second with a cadence on the tonic (ex. 2).

In listening more closely to the two phrases, one finds that both conform to the type of phrase that Schoenberg called a sentence, consisting of a presentation and a continuation; the presentation includes a basic idea and its repetition, while the continuation leads to a cadence. William E. Caplin refers to this embedding of two sentences within a period as

a sixteen-measure sentence.[5] Although extensions of Schoenberg's ideas about phrase structure by Caplin and others have tended to privilege music of the classical period, theorists have also analyzed periods and sentences in the work of earlier composers, including Bach.

In both the antecedent and consequent phrases in example 1, the basic idea is two measures long (mm. 1–2, 3–4, 9–10, and 11–12). Each appearance of the basic idea differs from the others, but all include a leap followed by a descending step. If we verticalize the leaps, turning them into simultaneous intervals, they provide important clues about the implied harmonies; the descending steps imply resolutions of suspensions. Thus, the harmonies in mm. 1 and 4 are tonic, and mm. 2–3 imply either dominant or dominant substitutes such as vii^{6}. Compositional elaborations of the cantus firmus may insert subordinate harmonies into this basic framework. Although mm. 1–4 prolong a single harmony, being enclosed by the tonic, the presentation in mm. 9–12 has a more dynamic quality, since it moves to new harmony, tracing a circle-of-fifths pattern (C-F-B♭-E♭). This tonicization of E-flat major at the end of this phrase suggests that treating mm. 7–8 as an imperfect authentic cadence in E-flat major might seem premature or redundant. Using a Phrygian cadence in mm. 7–8 also links the end of the antecedent to the beginning of the consequent by beginning the circle-of-fifths pattern in m. 8 (G-C-F-B♭-E♭).

As Caplin notes, the basic idea and its repetition do not generate a feeling "that thematic closure (or 'cadence') has been achieved"; instead, the "strongly ongoing quality [of] the presentation creates demand for a continuation phrase."[6] In the case of mm. 1–4, the static quality of the presentation is enhanced by the upper voice essentially prolonging a static C with neighbor motion above and below it. The continuation in both antecedent and consequent begins by using a rhythmically shifted form of the descending stepwise motion of the basic idea; the stepwise motion continues through scalar figures in mm. 5–6 and mm. 13–14, except that in the consequent the scalar motion leads up. Both continuation phrases also display the increase in surface rhythmic activity that often follows the statement and repetition of the basic idea. In mm. 7–8, a new dotted rhythm, combined with a reversal of melodic direction, suggests a cadential idea. The consequent phrase also has a cadential idea in mm.

[5] *Classical Form: A Theory of Formal Functions for the Instrumental Music of Haydn, Mozart, and Beethoven* (New York: Oxford University Press, 1998), 64.

[6] *Classical Form*, 10.

15–16, which is marked by new melodic and rhythmic figures, including an arpeggiation and a group of four sixteenth notes.

After completing this preliminary analysis, the next step is to sketch a skeletal bass line using mostly quarter notes with a few half notes. Once this is complete, one should also provide figured-bass signatures and add a third voice to clarify the harmony (ex. 3). The student can then activate the minimalist bass line in example 3 by adding melodic diminutions, including passing tones, neighbors, consonant skips within the same chord, as well as arpeggiations of a complete triad or seventh chord. An important consideration will be to avoid repeating the same pitch in immediate succession. Such repeated notes can seem like a mechanical way to keep the motion going, creating the effect of a rhythmic layer that implies a longer note value (ex. 4).

There are some obvious exceptions to the prohibition of repeated tones, which tend to work best under the following conditions: 1) if they are motivic (think of the beginning of Beethoven's Fifth Symphony); 2) when they function as suspensions or anticipations (the cantus firmus itself provides examples of both); and 3) when they "phrase," that is, when the repetition of a previous pitch starts a new phrase or subphrase. In correcting the exercises by Attwood mentioned above, Mozart eliminated several immediate repetitions of the same pitch, but added one in which the repeated note initiates a new subphrase.

Students should think of this as keyboard music, so it does not have to respect the limits of any vocal range; at the same time, it should be heard as a unified melodic line, balancing stepwise motion and leaps, with stepwise motion predominating. The various functional parts of the sixteen-measure period pose different contrapuntal problems. In the basic idea and its repetition, for example, students will quickly encounter the challenge of resolving suspensions over a moving bass line; example 5 shows a variety of solutions. A suspension might resolve over a different consonance, so a 4–3 suspension might resolve as 4–6 and a 7–6 suspension might resolve as 7–3. Notice that the octave leaps in examples 5a–b do not constitute prohibited pitch repetitions; repeating the note in a new register adds an element of freshness, allowing us to have our cake and eat it too. The suspension might also be followed by passing or neighboring motion.

In adding melodic diminutions to the sketch, one should try as many permutations as possible; examples 6–8 show multiple solutions for the first two measures. These are only representative possibilities, and students

should attempt to generate as many alternatives as possible, ideally trying to exhaust all plausible options. In the early stages of this sort of work, one can proceed mechanically, as one would in trying to discover all the possible moves in a chess game. Later, one can decide which options are best while working them into a continuous linear design.

Since the beginnings of the continuation phrases in mm. 5–6 and 13–14 move in constant eighth notes, they pose a new contrapuntal problem: how to deal with two voices moving simultaneously in notes of a uniform rhythm, in this case, eighth notes. The sketch in example 3 shows that mm. 5–6 prolong the dominant harmony, connecting D5 on the downbeat of m. 5 to D4 on the last eighth note of m. 6. This broad harmonic connection might be supported by movement in mostly imperfect consonances, since thirds, sixths, and their compounds can provide a fluent way to prolong and move between larger harmonies.

Example 9 shows how to use a series of voice exchanges in mm. 5–6. These exchanges emphasize contrary motion between the two voices. (I have followed the Schenkerian convention of labeling these exchanges as 10–6 rather than 3–6.) A voice exchange is a way to prolong a single harmony while ensuring melodic motion in two voices. Example 9a includes two 10–6 exchanges filled in with a passing octave (10–8–6); the crossed lines indicate the voice exchanges. A more complicated exchange involving four intervals occurs in example 9b: the 10–10–6–6 exchange.

Examples 10 and 11 demonstrate how to fill in these two measures using mostly parallel motion in imperfect consonances. Unlike species counterpoint, in which only three successive imperfect consonances of the same type are allowed in immediate succession, the larger scale of free composition makes it possible for more successive thirds or sixths to occur. At the same time, one might wish to insert other intervals to break up too much parallel motion. Example 10 shows several ways of interrupting a series of parallel sixths; example 11 shows how to prevent too many successive tenths.

Adding eighth notes to the Phrygian cadence in mm. 7–8 creates the potential for parallel octaves: how can one keep the bass moving while avoiding parallels in going from the iv^6 to the V harmonies? Example 12a shows parallel octaves in immediate succession; the anticipation on the last sixteenth note of m. 7 is not sufficient to avoid the sense of parallels. The attempted correction shown in example 12b leaps from the frying pan into the fire by placing octaves on successive strong eighth notes. Example 13 shows two possible solutions, one involving a

chromatic passing tone, the other an octave leap. Instructors can decide for themselves whether to warn students about these errors in advance or wait until they fall into these traps.

Example 14 shows an implied 7–10 sequence in mm. 9–12. This sequence offers an opportunity for motivic unity by having mm. 9–10 and 11–12 repeat the same melodic pattern a step lower. Example 15a repeats the same idea four times in a row, which may be a case of too much of a good thing. Examples 15b and c show sequential patterns that achieve both unity and variety.

The final cadence in mm. 15–16 suggests several different possibilities (ex. 16). Example 17 shows a less ideal solution: the tonic harmony arrives prematurely, and the final cadence is weakened by the lack of the strong root movement by fifth associated with an authentic cadence. The stepwise motion recalls the more melodic cadences of species counterpoint.

Example 18 represents a completed version of project 1. It is important for students to hear and discuss as many different solutions as possible, playing or singing the added part separately as well as with the cantus firmus. Beyond pointing out obvious errors in student work, they should also decide which versions are more elegant and beautiful. Perhaps the most important criterion for evaluating a solution is what I like to call "flow": a successful counterpoint exercise should have a certain spontaneous musicality and expressiveness that one can hear and feel without seeing the score and without any technical analysis. If a piece has this sense of flow, any voice-leading errors can be corrected. A piece can be perfectly "correct" in a pedantic sense and yet lack this quality. Indeed, error-free work often results from timidity, choosing bland options out of fear of making mistakes.

Another way to test a solution is to add an inner voice, which can be improvised at the keyboard or written out. Adding figured-bass signatures to the completed assignment will help greatly here. If a coherent third voice cannot be found, it may indicate problems that had previously eluded detection in the relationship of the cantus firmus and the added bass. Given the constant eighth-note movement of the bass, the inner voice can be rhythmically simpler, using a mixture of eighth, quarter, and half notes. One should strive for full triads whenever possible. Passing tones in the bass can often be doubled in the inner voice, moving in parallel imperfect consonances or in contrary motion by step.

Project 2: Add a Bass in Sixteenth Notes below the Cantus Firmus

Since most of the criteria involved in planning project 1 remain relevant to project 2, including the basic harmonic and voice-leading framework from example 3, project 2 can be explained more briefly. A few new factors, however, need to be considered. Since a solution in sixteenth notes requires twice as many notes as an eighth-note bass, creating more potential for monotony, a larger ambitus is usually desirable. It is also more difficult to sustain melodic interest and comprehensibility over so many notes, especially since they lack rhythmic variety, so more attention to motivic parallelisms is desirable. One could approach this task as shown in example 19 by adding sixteenth notes to a previously composed solution in eighth notes, as long as one makes room for a larger ambitus.

The series of four sixteenth notes in m. 15 requires special care, since it is rare for two voices to move in simultaneous sixteenth notes. When this happens, it is often better to have the voices move in a simple series of intervals, as in example 20; examples 20a–b show the prolongation of the dominant note G by a double neighbor figure, while example 20c shows stepwise motion below G moving in parallel sixths with the upper voice. Examples 20d–e show some options to avoid, because they mix a series of different intervals that can be difficult for the ear to assimilate. Both may initially look plausible, because one arpeggiates a dominant triad and the other a cadential $\frac{6}{4}$ chord, but they sound awkward. Example 21 contains a completed version of project 2. One could also improvise or write out an inner voice to this assignment.

Project 3: Add Two Voices in Free Rhythms below the Cantus Firmus

Project 3 is designed to sound more like "real" music: it invites students to compose in three voices, which not only creates fuller harmonies, but also encourages students to use rhythms that are free, although stylistically appropriate, in the two added parts. The three parts together should create a constant composite rhythm of sixteenth notes, in which the sum of all the attack points will create a uniform flow of sixteenth-note motion. Since the cantus firmus has only a few sixteenth notes, the burden of the sixteenth-note motion will fall primarily on the added parts. An important consideration will be to prevent the added parts from becoming too busy. Sometimes less is more.

An essential lesson here is to study and internalize the rhythmic freedom of Bach's counterpoint. One of my composition teachers, George Rochberg, used to warn about "the tyranny of the downbeat"; dull music

is often characterized by constant thumping on the main beats and too obvious a subservience to the notated meter. By contrast, Bach's music has an astonishing rhythmic buoyancy, and tends to float over the beats, despite having a constant and uniform pulse. A piece like the twenty-first variation in the *Goldberg Variations*, for example, shows numerous devices for concealing or deemphasizing the meter, including the use of short rests, ties, upbeat figures, and so on. These techniques should be studied in a number of Bach's works while completing project 3. One advantage of model composition is that it allows us to return to music analysis with fresh questions; only by trying to compose something that avoids the tyranny of the downbeat does one know what to look for in Bach's rhythmic miracles.

The freer writing of project 3 also offers more opportunities to create motivic relationships. It can be especially effective to derive these from the cantus firmus itself, which already has a dense network of motivic connections (exs. 22–23). Example 22 shows how the last five notes of the cantus firmus are the retrograde diminution of m. 13; this same motive had also appeared in a different rhythm and in the major mode in mm. 6–8. Example 23 displays transformations of this five-note motive, including retrograde, inversion, and retrograde inversion. The motive can also be parsed into a variety of three- and four-note melodic figures.

The three-part setting should be conceived for keyboard and should be playable by two hands. Here it is important to note that certain spacings that would not make sense in a choral context work perfectly well for keyboard; example 24 shows some possibilities, including one that is unplayable. A successful realization of project 3 should exploit the sonic resources of the keyboard to the extent permitted by the given material, including a variety of textures and spacings. Students who have access to historical instruments will find it rewarding to compare these to the different sounds produced on the harpsichord. Ideally, students should perform their own solutions at the keyboard, but in practice the instructor will have to use discretion to judge whether they have the skills or confidence to do this.

The simple voice-leading framework from example 3 will also provide a starting point for the more complex three-part writing of project 3, but it may be desirable to elaborate the bass to accompany the eighth notes of the cantus firmus, particularly in mm. 5–6 and 13–14, giving each of these bass notes its own triad or seventh chord (ex. 25). The framework should also be revised to include some double suspensions, and the class

should make a careful study of the possibilities here. They should notice the charm, for example, of resolving double suspensions simultaneously by moving in parallel thirds or sixths, comparing this to the different effect of resolving them at different times. In the completed assignment, it may even be possible to imply triple or even quadruple suspensions through the economical use of compound melody.

Example 26 demonstrates one method of composition: starting with a simple setting in half notes, quarter notes, and eighth notes, it adds melodic diminutions to create a constant composite rhythm of sixteenth notes while using motives derived from the cantus firmus. In example 26b, the motive labeled "X" in examples 22 and 23 is used to fill in a gap of a third in the middle voice in m. 1; the same motive is used in the bass in m. 2, returning to the inner voice in m. 3. Example 26c adds a second motive to this, consisting of various transformations of filling in a third.

The final cadence in mm. 15–16 requires special care. Example 27 provides some possible solutions that create a strong feeling of dominant-tonic closure while also providing pre-dominants such as ii^6 or vii^{o7}/V. Example 27e even includes an augmented-sixth chord, which must be followed by an elided resolution in which the augmented-sixth interval moves to a seventh rather than an octave. I encourage students to expand their harmonic imaginations by finding places for chromatic chords such as the augmented sixth or the Neapolitan sixth that might not seem like obvious chord choices to use with this cantus firmus.

Example 28 represents a completed solution in three parts. Needless to say, this cantus firmus offers many possibilities for equally rich solutions, and the students should compare and listen to as many of these as possible. One criterion for evaluating a solution is to play each voice all the way through by itself. In example 28, each voice has a relatively large ambitus; the bass, for example, has a range of two octaves, which allows it to explore contrasting registers while avoiding melodic monotony, and the inner voice has a range of an octave plus a minor seventh. The added parts also achieve a high degree of motivic saturation without sacrificing variety; the X motive, for example, appears in three transformations, and is also rhythmically shifted.

For some students, the transition to the freer writing of project 3 may be difficult. They may be intimidated by the demand to invent their own motives and to create a distinctive texture. In such cases, I have found it helpful to offer students several alternative beginnings, giving them the first four measures, with the basic idea and its repetition. The challenge

is then to use this as a premise for a sixteen-measure piece, composing a continuation that is consistent with the basic idea. This manner of working often gives students the confidence to invent their own textures. Example 29 includes two alternate possibilities for beginning project 3, either of which could be used as an assignment.

Conclusion

I have not discussed the other two sections of BWV 991, both of which could provide excellent material for additional composition projects. The florid melody of the Air is complete in every detail, but the last seven measures of the bass need to be added. In contrast to this relatively straightforward task, completing the second variation presents a formidable challenge; Bach provided only a melodic line, and even that ends after ten-and-a-half measures. The completion would need to extend the exceptionally ornate melody, while also providing an accompaniment. Although one could get away with writing a simple bass line in eighth notes, it might be preferable to make this variation into a true duet, with an equally ornate bass line in dialogue with the upper voice, including the groups of thirty-second notes that are so prominent in the fragment.[7]

Adorno remarked that artists do not only create individual artworks, "for artists are always also at work on art itself," developing the languages and techniques that are the collective achievement of thousands of people working over centuries.[8] Courses in counterpoint allow students to join that collective process, learning the craft and assimilating the languages that may allow them to participate more fully in the art. When Einstein was asked what he wanted to do next after completing the general theory of relativity, he replied: "I want to spend the rest of my life thinking about what light is." In much the same way, Bach devoted his life to thinking about what music is, or what it might become. It is a recipe for a life well spent, and a goal toward which students and teachers alike may aspire.

[7] Students who are seeking more challenging material could turn their attention to Contrapunctus 14, the unfinished quadruple fugue from Bach's *Die Kunst der Fuge*. I have discussed the problems of completing this piece in a recent essay, which includes my own completed version. See "At the Margins of Music Theory, History, and Composition: Completing the Unfinished Fugue in *Die Kunst der Fuge* by J. S. Bach," *Music Theory & Analysis* (*International Journal of the Dutch-Flemish Society for Music Theory*) 3 (2016): 115–43.

[8] Theodor W. Adorno, *Aesthetic Theory*, trans. and ed. Robert Hullot-Kentor (London: Bloomsbury, 1997), 249.

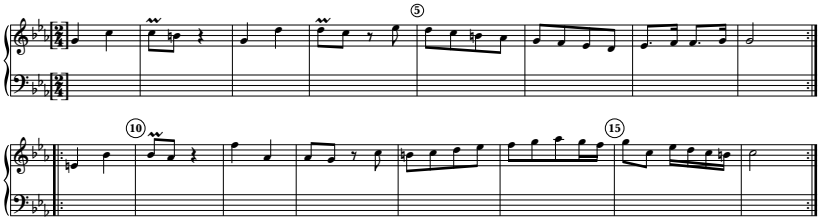
Abstract

Bach's unfinished Air with Variations in C Minor BWV 991, from the 1722 *Clavierbüchlein für Anna Magdalena Bach*, may have been designed as a set of compositional exercises for students to complete. This essay uses the first variation, which consists of a single melodic line with no other voices, as a cantus firmus for a progressive series of projects in composition or improvisation, suitable for an undergraduate course in eighteenth-century counterpoint.

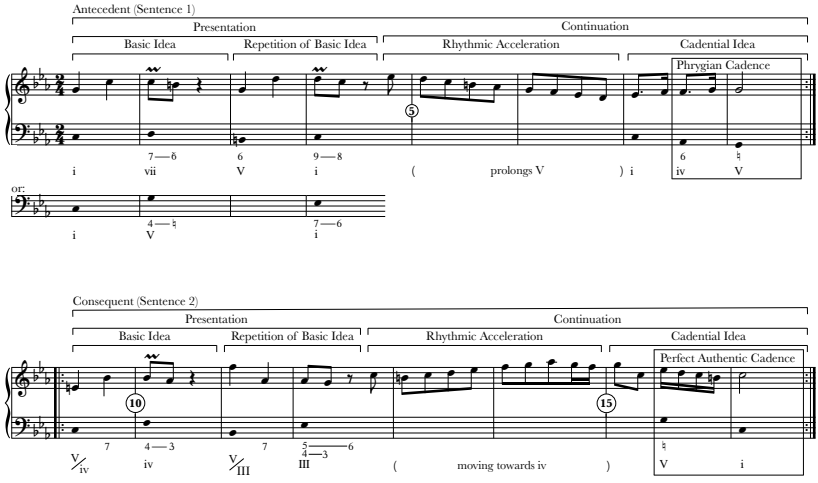
The first two projects provide a transition from previous work students may have done in strict species counterpoint in the Fux tradition. In project 1 they add a counterpoint entirely in eighth notes below the cantus firmus, while in project 2 they add a counterpoint in sixteenth notes. Project 3 is intended to sound more like "real" music, requiring students to add two voices in free rhythms beneath the given melody. This encourages them to maximize the expressive use of dissonance while achieving rhythmic fluency and melodic independence in a three-part texture.

Since much of the pedagogy of counterpoint in Western music has depended on an oral tradition, this approach tries to fill in gaps in the oral record by guiding students and teachers through all the steps of planning and execution involved in completing these projects.

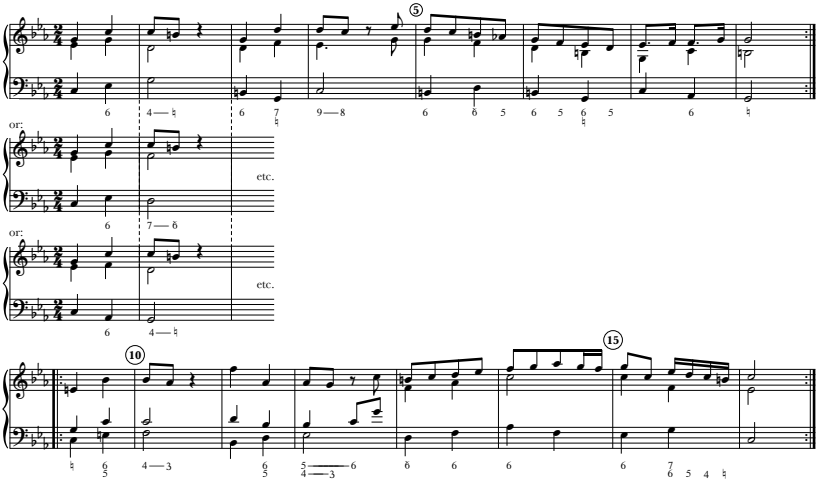
Example 1. J. S. Bach, Air with Variations in C Minor BWV 991, mm. 17–32, renumbered here as mm. 1–16 (hereafter "J. S. Bach, cantus firmus")



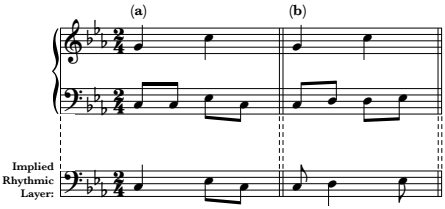
Example 2. J. S. Bach, cantus firmus, mm. 1–16: phrase structure and implied harmonies



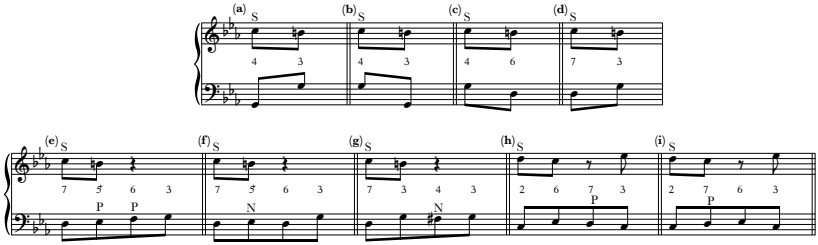
Example 3. J. S. Bach, cantus firmus: simple setting of mm. 1–16 in three voices with figured bass



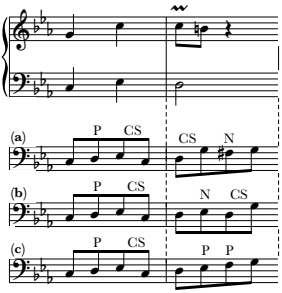
Example 4. Rhythmic implications of repeated notes



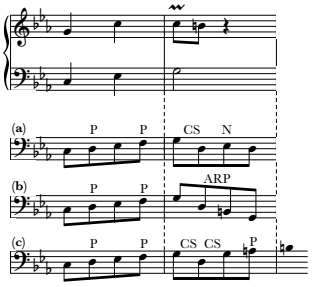
Example 5. Resolving repeated notes over a moving bass



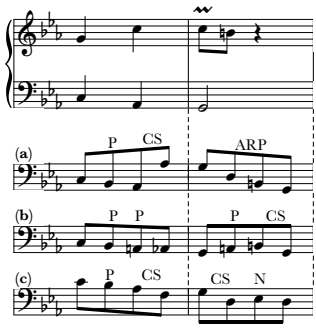
Example 6. J. S. Bach, cantus firmus, mm. 1–2: adding eighth notes to the simple bass



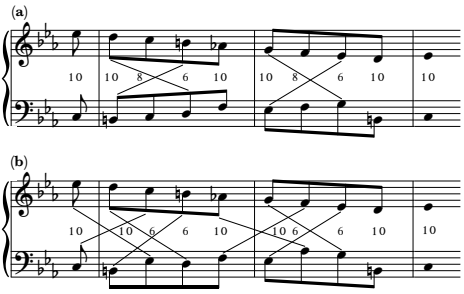
Example 7. J. S. Bach, cantus firmus, mm. 1–2: adding eighth notes to the simple bass



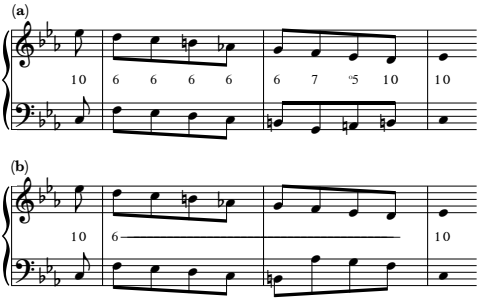
Example 8. J. S. Bach, cantus firmus, mm. 1–2: adding eighth notes to the simple bass



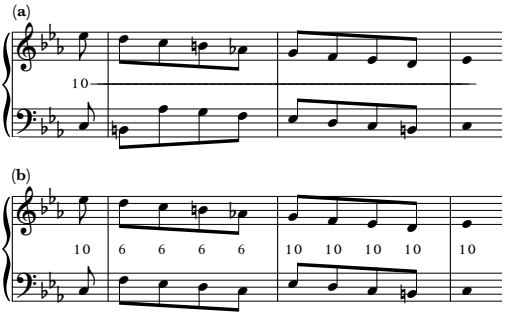
Example 9. J. S. Bach, cantus firmus: voice exchanges in mm. 5–6



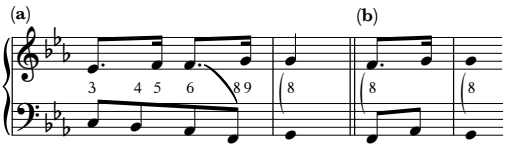
Example 10. J. S. Bach, cantus firmus: different ways of breaking up parallel sixths in mm. 5–6



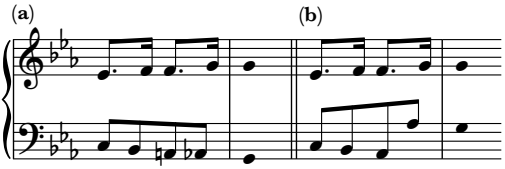
Example 11. J. S. Bach, cantus firmus: different ways of breaking up parallel tenths in mm. 5–6



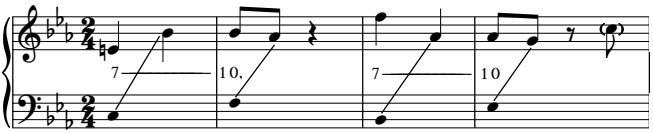
Example 12. J. S. Bach, cantus firmus, mm. 7–8: parallel octaves at the Phrygian cadence



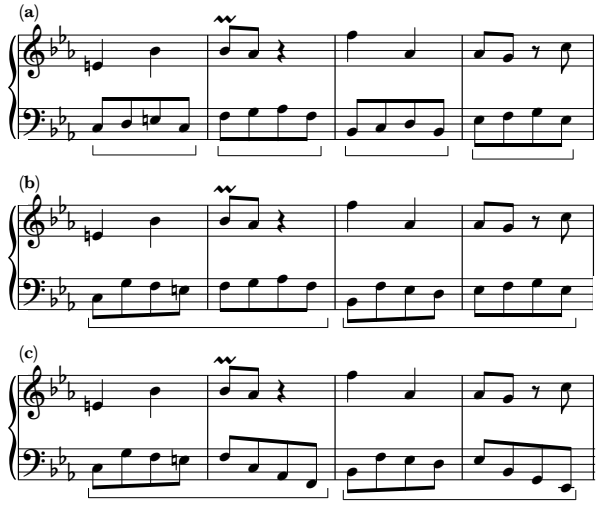
Example 13. J. S. Bach, cantus firmus, mm. 7–8: avoiding parallel octaves



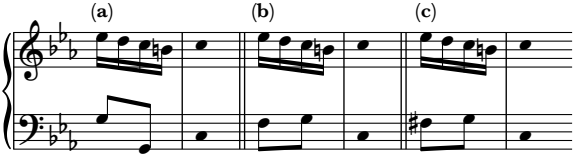
Example 14. J. S. Bach, cantus firmus: implied sequence in mm. 9–12



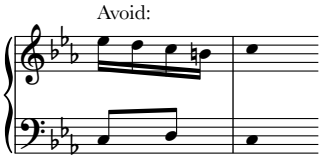
Example 15. J. S. Bach, cantus firmus, mm. 9–12: melodic parallelisms



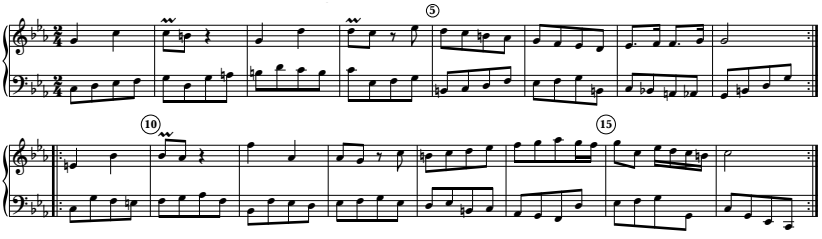
Example 16. J. S. Bach cantus firmus, mm. 15–16: solutions for final cadence



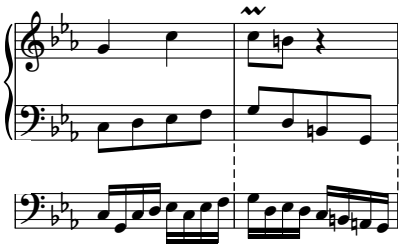
Example 17. J. S. Bach cantus firmus, mm. 15–16



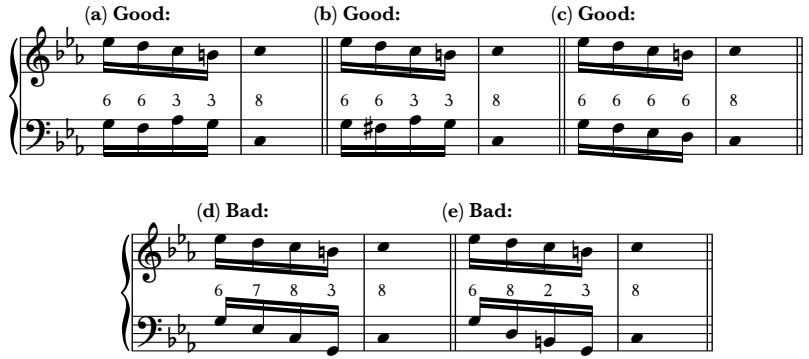
Example 18. J. S. Bach, cantus firmus, mm. 1–16: simple eighth-note bass line



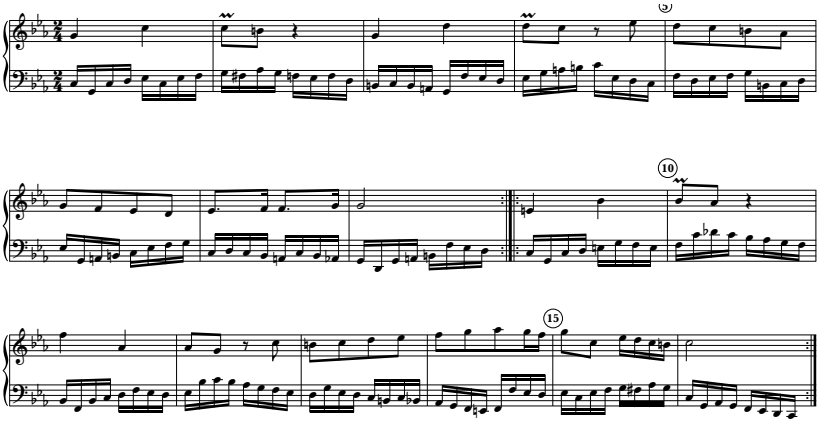
Example 19. J. S. Bach, cantus firmus, mm. 1–2: adding sixteenth notes



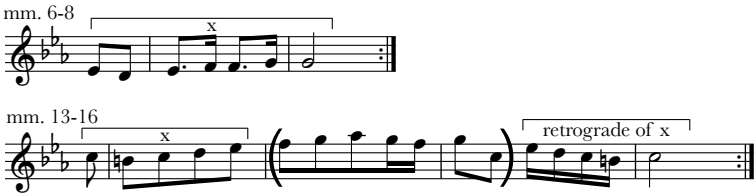
Example 20. J. S. Bach, cantus firmus: possibilities for final cadence



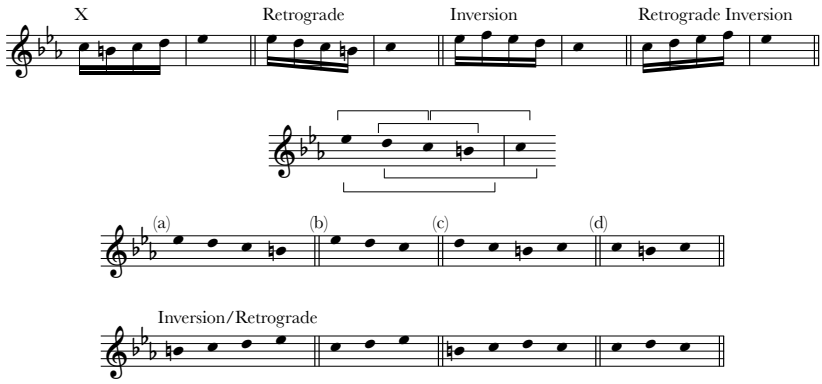
Example 21. J. S. Bach, cantus firmus, mm. 1–16: bass in sixteenth notes



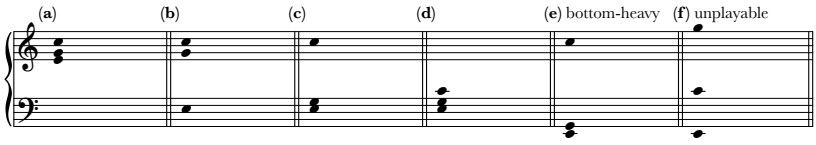
Example 22. J. S. Bach, cantus firmus: potential motives



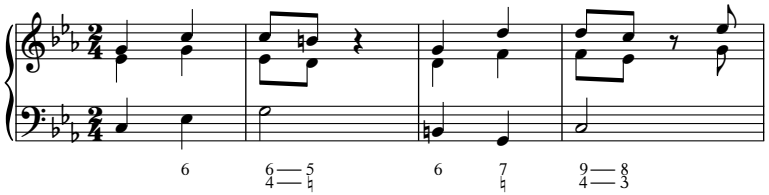
Example 23. Transformations of motive X



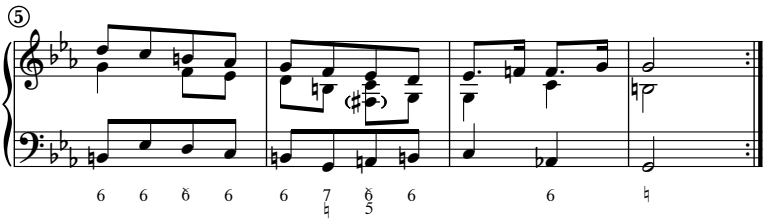
Example 24. Keyboard spacings



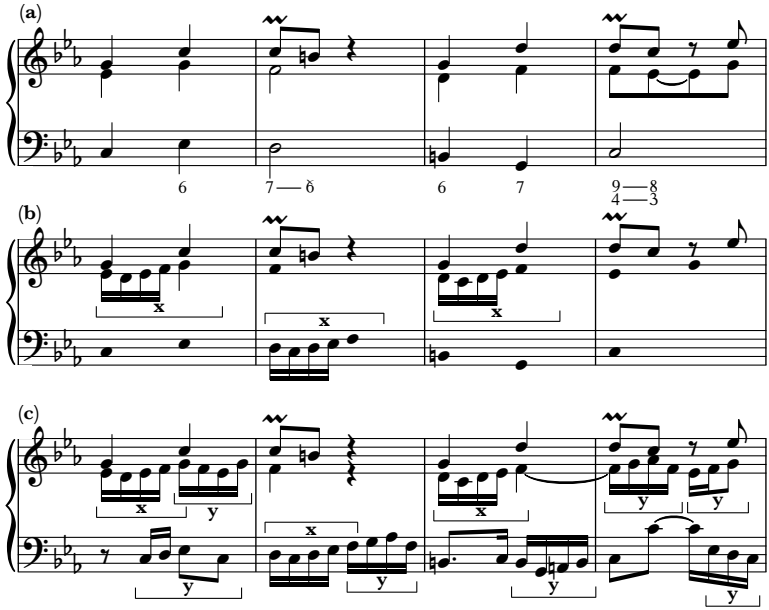
Example 25. J. S. Bach, cantus firmus, mm. 1–8: three-part sketch in half notes, quarter notes, and eighth notes



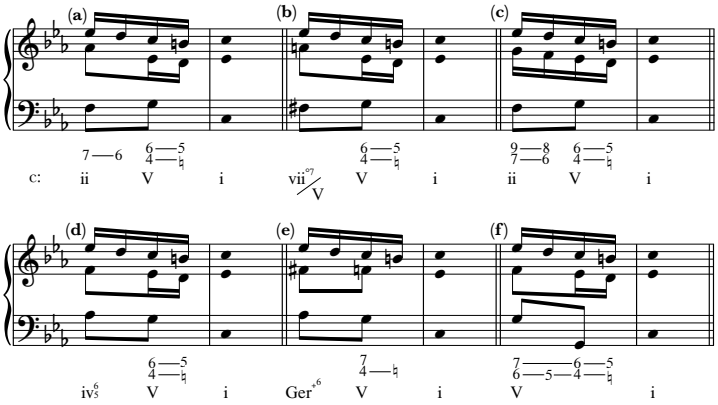
Example 25 (con.)



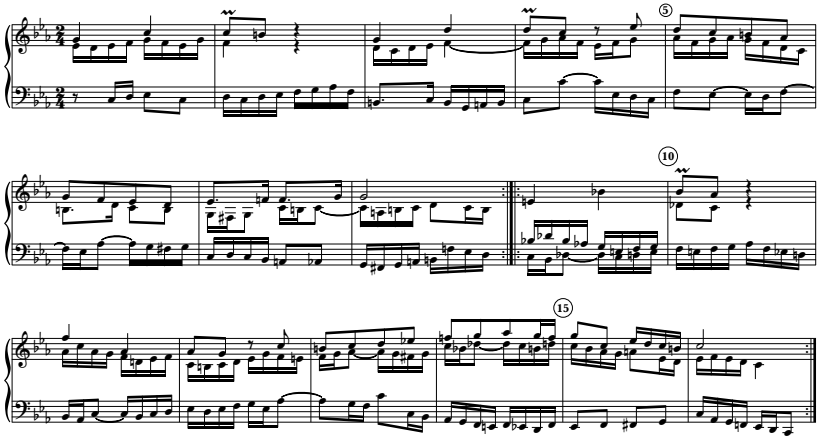
Example 26. J. S. Bach, cantus firmus, mm. 1–4: adding diminutions to the three-part sketch



Example 27. J. S. Bach, cantus firmus: options for final cadence in three voices



Example 28. J. S. Bach, cantus firmus, mm. 1–16: three-part setting by Kevin Korsyn



Example 29. J. S. Bach, cantus firmus, mm. 1–4: additional three-part settings by Kevin Korsyn