

The Rule of the Octave in First-Year Undergraduate Theory: Teaching in the Twenty-First Century with Eighteenth-Century Strategies

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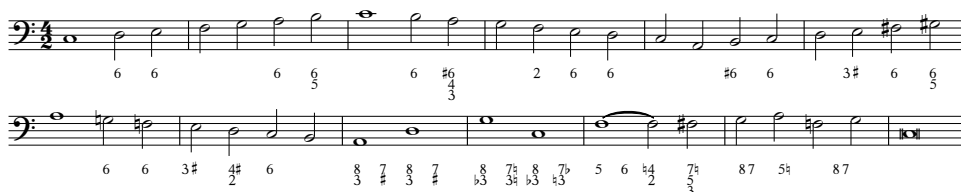
From the Neapolitan conservatories to Mozart's Vienna, eighteenth-century musicians commenced the study of harmony by learning a rule of thumb for the harmonization of scalar basses known as the Rule of the Octave. This article presents a series of strategies to incorporate the Rule into the core music theory curriculum, including activities for analysis, keyboard skills, and singing improvisations. I suggest a parallelism between the Rule of the Octave and linguistic collocations (groups of words that typically go together), and turn to recent research on second-language acquisition to defend the importance of memorizing the Rule of the Octave. This initial, apparently rudimentary step conduces to significant learning of tonal harmony. Sharing my personal experiences with the Rule of the Octave in the classroom, I illustrate the potential pedagogical benefits of recovering and updating a teaching resource crucial in the history of Western music.



For one of their composition lessons, Mozart assigned to Thomas Attwood a simple figured-bass exercise beginning with an ascending and descending C major scale, followed by the same process in the relative minor (the complete given bass is reproduced as Example 1). This exercise presents what eighteenth-century musicians called the *Rule of the Octave*, a rule of thumb for the harmonization of scalar basses. Once considered the most fundamental harmony lesson (second only to cadences) and a scaffold to much music-theoretical knowledge, the Rule of the Octave is absent from most music theory textbooks today.¹ In this article, I will discuss the benefits of teaching harmony with the Rule of the Octave, arguing that it represents a musical analogue to what linguists call *collocations*—which have been proven essential for second language acquisition. I will share my experiences teaching harmony to college freshman with the Rule of the Octave and suggest strategies for incorporating this historically-inspired pedagogical tool into the twenty-first-century classroom. I hope these ideas will inspire more teachers to include the Rule of the Octave in their music

¹ Exceptionally, the workbook for Clendinning and Marvin's *The Musician's Guide to Theory and Analysis* includes three figured-bass exercises inspired by the Rule of the Octave (2016, 173 and 207). For detailed historical and theoretical accounts of the Rule of the Octave, see Christensen (1992), Gjerdingen (2007, 467–70), and Sanguinetti (2012, 113–23). See also Callahan (2010) for a keyboard-oriented approach incorporating the Rule into 21st-century pedagogy.

theory curricula; those who already teach the Rule may find new ideas to exploit its great pedagogical potential.²



Example 1

Rule of the Octave as presented to Attwood by Mozart.

An analogy from second-language acquisition: The Rule of the Octave as a musical meta-collocation

Similarities between music and language—albeit loose—have motivated music scholars to draw on linguistic research to theorize musical structure.³ These parallelisms also apply from a pedagogical perspective, since teaching music theory and teaching a second language engage similar skills. The goals of both disciplines include listening (aural skills) and reading comprehension (analysis), as well as fluency in speaking (oral and keyboard skills) and writing (composition, part-writing). Second-language acquisition involves learning groups of words that typically go together, known in linguistics as collocations.⁴ For example, an English language student needs to learn how to use the verb ‘to break’ together with words such as ‘someone’s heart,’ ‘the news to someone,’ ‘a promise,’ ‘a leg,’ ‘the law,’ or ‘the ice.’ Learning such common

² The ideas, approaches, and teaching experiences that I present here have been inspired and developed in collaboration with my mentors and colleagues at Northwestern University. Robert Gjerdingen first introduced the Rule of the Octave in the undergraduate curriculum and Susan Piagentini has been largely responsible for materializing the idea into teaching practice. She developed the arpeggiation exercise (see Figure 1 below) and the introduction to harmonic dictation using excerpts from the Rule of the Octave; the rest of the materials and activities presented here are mine. I thank Susan Piagentini and Vasili Byros for their contributions to my development as a music-theory pedagogue and Robert Gjerdingen for introducing me to the Rule of the Octave and encouraging me to think about parallelisms between music and language. I extend my gratitude to Janet Bourne and my anonymous reviewers for their insightful comments and suggestions on an earlier version of this article.

³ See, for example, Monelle (1992), Feld and Fox (1994), and Agawu (2009, 15–29).

⁴ For a broader discussion of the musical implications of linguistic collocations, with an emphasis on galant schemata, see Gjerdingen and Bourne (2015). Their focus is on first-language acquisition and usage rather than second-language learning.

idiomatic phrases requires addressing and memorizing them individually: no amount of grammar and vocabulary can conduce to this type of knowledge. Teaching the Rule of the Octave to music students is not unlike teaching collocations to second-language learners.

A significant and increasing body of literature emphasizes the importance of teaching collocations in second-language acquisition. These scholars argue that progress beyond lower-intermediate level requires learning “a substantial amount of chunks” (De Knopp et al. 2010, 242), and that memorizing formulaic sequences increases fluency, accuracy, and variety in speaking and writing (Wray 2004, Ding 2007, Dai and Ding 2010). Some studies suggest that learners are not sufficiently aware of the significance of collocations, and that teachers need to increase their students’ awareness about frequent combinations of words (Vasiljevic 2014); other studies have found that rising awareness alone has little influence on learning formulaic sequences, which instead requires intentional memorization through announced tests or targeted activities (Boers and Lindstromberg 2008). One finding of this body of research—especially significant due to its implications for music theory pedagogy—is that memorized formulaic sequences are processed faster than the sum of their component parts (Wray 2002). Processing speed is essential for music students, who are expected not only to acquire theoretical knowledge of chords, functions, and voice-leading, but also to put this knowledge to practical use in playing, singing, listening, and analyzing. These skills require them to process their knowledge quickly, almost immediately, without having to rely on time-consuming retrievals from memory or logical derivations.

In the language of music, the Rule of the Octave is not exactly a collocation: musical utterances rarely feature complete scales in the bass. Instead, the Rule constitutes a meta-collocation of sorts, a chunk of chunks that contains shorter harmonic progressions that appear with high frequency in tonal music. As Sanguinetti observes, “one of the great advantages of the RO is that it can be used even for short segments” (2012, 114). But because the Rule also constitutes a whole progression with its own internal logic and musicality, students can learn, practice, and remember it as a unit, which makes the Rule of the Octave a cognitively efficient tool to teach its many subsets at once. Learning the Rule requires a memorization effort in the initial stage—as learning linguistic collocations—but then provides a solid scaffold to study the harmonic language of the common-practice period. The Rule of the Octave contributes to held together knowledge about tonal harmony and voice leading under one overarching concept, thus making this knowledge more memorable and easily

retrievable.

Harmonization and theoretical implications

The underlying logic behind the Rule of the Octave is that “each scale degree can be associated with a unique harmony, which reciprocally defines that scale degree” (Christensen 1992, 91). Because of this pairing between chords and scale degrees, the Rule of the Octave “is more than an ingenious tool for accompaniment of a scale; it is a powerful means of tonal coherence” (Sanguinetti 2012, 113). The association between scale degrees and chords conveyed by the Rule of the Octave derives from general principles regarding consonance, dissonance, and perceived stability. The Rule reflects the fluid compositional practice of eighteenth-century musicians and appears in different versions; the version popularized by Fedele Fenaroli, reproduced as Example 2, had become the standard by the second half of the eighteenth century (Sanguinetti 2012, 114).⁵ The basic theoretical underpinning of this version of the Rule is the pairing of the most stable degrees of the scale— $\hat{1}$ and $\hat{5}$ —with the most stable interval—the perfect fifth—, whereas the remaining scale degrees are associated with the less perfect sixth. To create momentum towards points of stability, the chords that precede $\hat{1}$ and $\hat{5}$ include dissonances. Because of this principle, the Rule takes different forms depending on whether we are ascending or descending: when approaching $\hat{1}$, $\hat{7}$ supports a $\frac{6}{5}$ and $\hat{2}$ a $\frac{6}{4}$; when leading to $\hat{5}$, $\hat{4}$ takes a $\frac{6}{5}$ and $\hat{6}$ a $\frac{\#6}{3}$ respectively. Finally, because $\hat{3}$ is considered somewhat stable, it is also preceded by a dissonant chord:

Example 2

Rule of the Octave for Major and Minor scales, after Fenaroli (1775).

⁵ It also coincides with François Campion's earlier *Règle de l'Octave* (1719), quoted in Christensen (1992, 91).

a $\frac{6}{4}$ on $\hat{2}$ for the ascending scale and a $\frac{6}{2}$ on $\hat{4}$ for the descent.⁶

The principles and chord progressions that constitute the Rule of the Octave embody a wealth of knowledge about tonal harmony condensed in a concise formula. Members of the tonic triad divide the Rule of the Octave into subsets that appear frequently in the music of the common-practice period and cover several topics relevant for the core music theory curriculum:

- a) $\hat{1}-\hat{2}-\hat{3}/\hat{3}-\hat{2}-\hat{1}$: Tonic prolongation and the passing V_3^4 (or vii^{o6}) chord.⁷
- b) $\hat{3}-\hat{4}-\hat{5}$: Extended cadential progression, with ii_5^6 as a common predominant.
- c) $\hat{6}-\hat{7}-\hat{8}$: Contrapuntal cadence. (This segment appears less frequently in actual bass lines than all others.)
- d) $\hat{8}-\hat{7}-\hat{6}-\hat{5}$: The downward, stepwise approach to the dominant shares its harmonic progression ($I-V^6-V_3^4/V-V$) with the modulating Prinner from Gjerdingen's lexicon of galant schemata (2007). In minor, Fenaroli harmonizes descending $\hat{6}$ with an augmented-sixth chord.
- e) $\hat{5}-\hat{4}-\hat{3}$: Evaded cadence/passing V_2^4 .

Teaching the Rule of the Octave in the twenty-first-century classroom

My first experiences teaching the Rule of the Octave took place at Northwestern University within a music theory curriculum that unfolded in a historical manner, beginning with counterpoint and continuing with figured bass. Within this context, I presented the Rule of the Octave to my students after they had learned three-part species counterpoint, principles of keyboard-style harmonization, and common cadential progressions.⁸ Although teaching the Rule of the Octave is particularly

6 For a visual explanation of the generative principles of the Rule of the Octave see Robert Gjerdingen's website, "Monuments of Partimenti," <http://faculty-web.at.northwestern.edu/music/gjerdingen/partimenti/index.htm>. The simplest realization, by Alessandro Scarlatti, uses only triads in root position and first inversion and harmonizes $\hat{6}$ with a $\frac{5}{3}$; the version of Francesco Durante harmonizes $\hat{2}$ with a $\frac{5}{3}$ and ascending $\hat{4}$ with a $\frac{5}{3}$ (as in Mozart's exercise).

7 Comparison between versions of the Rule that harmonize $\hat{2}$ with either $\frac{5}{3}$ such as Scarlatti's or Mozart's) or $\frac{6}{4}$ (as Fenaroli's) highlights the functional similarities between vii^{o6} and V_3^4 chords. Interestingly, the passing V_3^4 —which current music theory textbooks often present before vii^{o6} and V_3^4 chords—did not participate in any of the eighteenth-century realizations of the Rule of the Octave.

8 I was fortunate to teach the honors section of music theory—coordinated by Vasili Byros—, which placed particular emphasis on species counterpoint, but the progression from counterpoint to figured bass to the Rule of the Octave characterizes the music theory curriculum at Northwestern University

appropriate in a historically-inspired curriculum of this kind, it is not necessary to fully commit to the historicist impulse to take advantage of the Rule's benefits. For example, within a more typical music theory curriculum, the Rule of the Octave can be smoothly incorporated after having introduced tonic and dominant chords, since I and V⁽⁷⁾ with their inversions account for seven of the ten different chords that appear in the standard version of the Rule. The harmonization of an ascending and descending scale in the bass presents, all at once, the most typical contexts for I⁶, V₃⁴, V₆⁶, and V₂⁴ chords. Two of the remaining chords of the Rule of the Octave—ii₅⁶ and V₃/V, yet to be theorized in this scenario—would provide a reasonable segue to the introduction of predominant function.⁹

Because the Rule of the Octave conveys a good deal of knowledge about chord grammar, one could spend significant time explaining its theoretical underpinnings. Instead, I suggest that in this case we may better serve our students by focusing on experience before conceptualization. I explain the basic principles underlying the harmonization of scale degrees based on their relative stability, but there is minimum theoretical commentary and no discussion of individual chords—the emphasis is on practice and memorization.¹⁰ I require my students to provide the figures corresponding to the Rule at a short quiz at the beginning of class, to write a four-part realization in a given key (including Roman numerals) for the exam, to arpeggiate the Rule from memory using movable Do solfège, and to play it in different keys at the keyboard.¹¹

Much of this memorization process takes place in the aural skills classroom, where we sing the Rule of the Octave by arpeggiating every chord, ascending and descending. First, students read from a sheet that shows solfège syllables for the complete Rule of the Octave (shown as Figure 1). Then, we encourage them to rely on

as a whole. I use “we,” to refer to activities or strategies common across sections and designed by the curriculum coordinator, Susan Piagentini. I reserve the first-person singular for those activities that I devised specifically for my students.

⁹ I am aware that the idea of introducing an applied dominant so early in the chord vocabulary may meet some resistance. In response, I would argue that putting it on hold until all diatonic chords have been introduced does not do justice to the statistical prominence of V/V in the common practice period. Instead, an early introduction of #4—with or without harmonic conceptualization—expands the universe of viable musical examples for analysis, sight-singing, and transcription significantly.

¹⁰ Some students find the amount of information overwhelming at first: approaching the Rule as a figured-bass exercise makes it fairly accessible, but I also tell students that my intention is to show the “bigger picture” before we delve into the details.

¹¹ The five-minute quiz simply provides an ascending and descending scale in bass clef; students are asked to annotate it with figures. In the written exam, I present a grand staff with a key signature; students write a four-part realization of the Rule of the Octave in keyboard style.



Example 3

Arpeggiation of the Rule of the Octave with a syncopated rhythmic pattern.

Although these arpeggiation exercises facilitate learning chord structure and building connections between bass lines and implied harmonies, they entail a risk of neglecting voice leading. To ensure that students remain mindful of the horizontal implications of the chord progression, I sing the Rule of the Octave with them in four-part harmony, rotating the parts so that everyone becomes familiar with every horizontal line.¹³ Requiring students to learn the Rule of the Octave at the piano provides a good reinforcement to the emphasis on voice leading, although it presents a challenge for those without previous keyboard experience. To facilitate the task, I focus on a limited number of keys and chord positions. For example, I asked my students to play the Rule of the Octave in major keys up to two sharps or flats always using the same position—so that they could focus on learning successions of hand shapes.¹⁴ I prefer to teach the position with Do in the soprano (previously shown as Example 2), because the alternation between Do and Ti emphasizes changes in harmonic function.¹⁵ With these parameters, playing the Rule of the Octave at the keyboard is an accessible goal regardless of individual differences in keyboard skills: although several students initially complained about the task being too difficult, everyone in the class was able to play the Rule (with various degrees of fluency) after two weeks of practice. As with the arpeggiation exercise, students submitted videos of their performances of the Rule of the Octave in different keys at the piano and eventually played it from memory in a keyboard-skills test.

To be sure, memorization and testing are neither alluring nor fashionable teaching strategies. Modern pedagogy and public opinion treat rote learning with skepticism, opposing it to “meaningful” or “deep” learning and challenging its pedagogical value (Meyer 2002, Novak 1990, Towler 2014). Risks and limitations notwithstanding, memorization through repetition is still considered a valuable tool (Arevalo 2015),

13 The Rule of the Octave teaches good voice-leading, with the caveat of the parallel fifths between alto and soprano at $\hat{6}$ – $\hat{7}$ on the ascent. All eighteenth-century treatises tolerated these parallel fifths in keyboard style.

14 The focus on the physical appearance of chords does not aim to substitute conceptual understanding of intervals and scale degrees, but I find it a useful teaching aid to develop keyboard skills.

15 Especially relevant when applying the Do-Ti test (see Stevens 2016) for harmonic hearing.

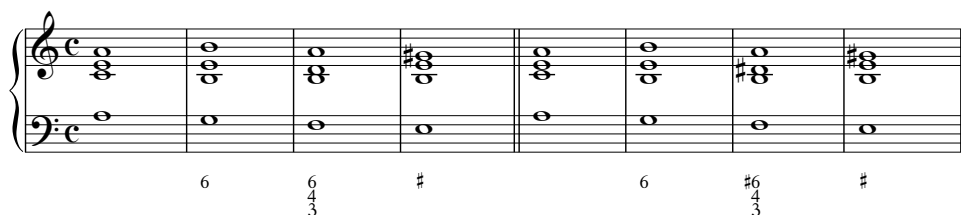
especially in second-language learning (Nasrollahi-Mouziraji and Nasrollahi-Mouziraji 2015)—a process not unlike that of learning a specific musical style, as I argued above. Educators in all fields and levels frequently face decisions regarding whether or how much content students should commit to memory. When teaching tonal harmony, I have found that memorizing the Rule of the Octave is worth the effort and that the reward of this initial learning step is momentous. Teaching the Rule scaffolds future learning of harmonic vocabulary, improves analytical skills, facilitates harmonic dictation, enhances keyboard performance, and allows structured improvisation.

a) From the Rule of the Octave to mastering tonal harmony

The Rule of the Octave teaches a significant subset of the vocabulary of tonal harmony efficiently (in the course of about two weeks). This musical knowledge need not be explicit from the beginning. At this stage, students interiorize, for example, that ii_5^6 precedes the dominant, that V_3^4 prolongs tonic, that V_2^4 resolves to I^6 , or that $\hat{3}$ should be generally harmonized as I^6 instead of as iii —before they have acquired the vocabulary and formal categories to describe these harmonic concepts. Later, when we make explicit the form and function of certain chords and harmonic paradigms, and discuss them in more detail, students can relate these concepts to their previous experience. This approach to teaching tonal harmony follows the principles of what pedagogues call, self-evidently, the Whole-Part-Whole learning model. By presenting first a simplified “Whole,” the model “introduces new content to learners by forming in their minds the organizational framework to effectively and efficiently absorb the forthcoming concepts” thus providing “a mental scaffolding to prepare the learners for the new instruction” (Swanson and Law 1993, 44–45). The Rule of the Octave, as a manageable compendium of limited yet varied chord progressions, provides an effective “first Whole” to the complete chord vocabulary and grammar of tonal music.

Teaching harmony with the Rule of the Octave implies changes to the typical order (as reflected by most music theory textbooks) in which certain chords are introduced. For example, based on this way of presenting material, students encounter the ii_5^6 chord before ii , ii^6 , or IV chords. There are obvious pedagogical reasons to organize instruction by order of difficulty, therefore teaching triads before seventh chords, root position chords before inversions, and diatonic chords before chromatic ones. The selection of chords that participate in the Rule of the Octave, although not exactly aligned with an organization of harmonic content in terms of conceptual difficulty, provides a fair representation eighteenth-century harmony based on frequency of

chord usage. Because of this way of prioritizing concepts, students encounter certain chromatic harmonies, such as the V_3^4/V chord, relatively early. Similarly, in the minor mode, Fenaroli's version of the Rule of the Octave harmonizes the same point of the scale—the descending approach to the dominant—with an augmented-sixth chord. When I formally introduce this chord (after the period of intensive study of the Rule of the Octave is over), I sing two different harmonizations of a stepwise descent in minor from $\hat{1}$ to $\hat{5}$ with my students: an earlier version of the Rule of the Octave by Dandrieu (1735) and the familiar one by Fenaroli (1775, both segments presented in Example 4). The comparison with a diatonic version of the chord helps students learn the function and contrapuntal implications of the augmented sixth.¹⁶ Previous knowledge of the Rule of the Octave is not necessary to establish such analogies, but repeated practice increases familiarity with the pattern, thus strengthening the effect of the comparison.



Example 4

Fragment of the descending Rule of the Octave after Dandrieu (left) and Fenaroli (right).

Exceptions to the Rule of the Octave—such as the harmonization of $\hat{2}$, $\hat{4}$, or $\hat{6}$ with a $\frac{5}{3}$ when approached or left by leap—provide a possible path to expanding harmonic vocabulary beyond the harmonies that appear in the Rule. Sequences follow nicely, inviting students to consider segments of basslines as members of one of two possible categories: those that move by step (largely explained by the Rule) and those that leap (largely explained as cadences and sequences). Obviously, students can acquire similar knowledge when content is presented in a different order. The advantage of using the Rule of the Octave is that it makes knowledge accessible and easier to remember by having it condensed under a single conceptual unit.

¹⁶ Presenting new content using analogy has been found an effective way to improve learning (Gentner 2010).

b) Incorporating the Rule of the Octave into music analysis

One of the lessons that students implicitly learn with the Rule of the Octave is the importance of bass lines and how to read their harmonic implications. Memorizing this standard harmonization enables students to infer harmonies from basslines with fluency and accuracy. During the process of learning the Rule of the Octave, I expose students to multiple examples of music that contain subsets of ascending or descending scales in the bass. To be sure, real basslines do much more than move stepwise but nevertheless subsets of the Rule of the Octave account for a substantial number of harmonic progressions found in eighteenth-century music. (As a sample, Example 7 shows the total number of appearances of each subset of the Rule in the expositions of Mozart's Piano Sonatas, computed by myself.)

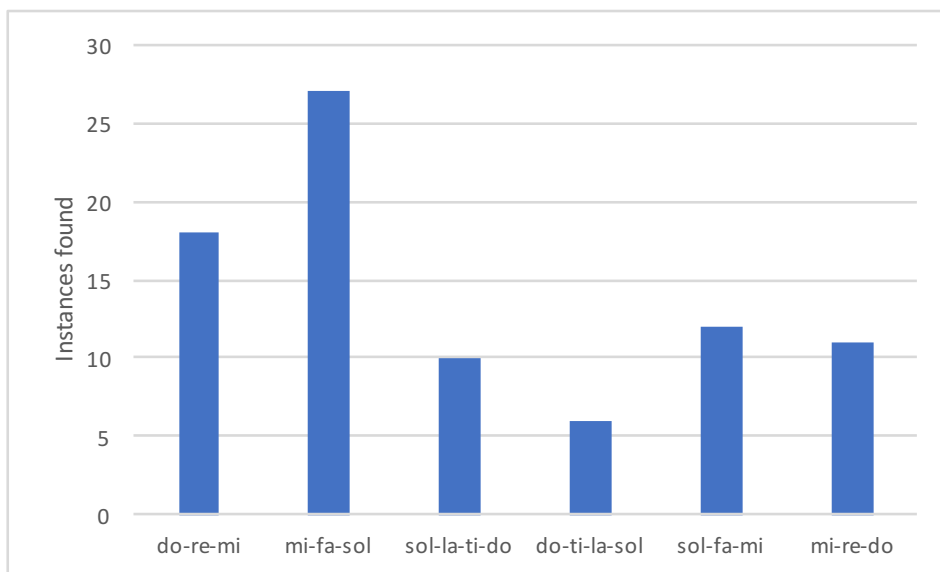


Figure 2
Number of instances of the subsets of the Rule of the Octave
in expositions of Mozart's Piano Sonatas.

Examples of baroque music with unfigured basses provide an opportunity to approach harmonic analysis with a practical question: how would you harmonize the bass line if you were the continuo player? This type of question addresses directly the kind of skill targeted by the Rule of the Octave in its original historical context. For

example, I present my students with the last six bars of the A section from Handel's aria "Piangerò la sorte mia" (Example 5). The class provides the figures implied by the Rule of the Octave, we confirm them with the violin parts, and then write a possible realization in keyboard style. After having examined this segment, which projects a standard realization of the Rule of the Octave, I bring students' attention to the beginning of this lament aria, where Handel uses the descending scale in the bass but harmonizes it differently at each occurrence (Example 6). The comparison exercise serves to present different ways of harmonizing the same bass line and offers an opportunity to engage students in questions of musical expression. At the onset of the aria, weeping Cleopatra lacks the momentum associated with the forward-driving succession of chords of the Rule of the Octave. Her first descent lacks $\sharp 4$ over $\hat{6}$; for the second iteration (m.6), she sings to the even more passive, downward sliding seventh in the bass instead of using the V^6 chord; and the third, incomplete descent (mm. 11–12) emphasizes the minor quality of the submediant chord. Only for the last iteration of the descent in the bass (Example 5), when Cleopatra is about to explode in anger for the contrasting section of this aria da capo, did Handel deploy the standard Rule of the Octave—perhaps finding the "correct" harmonization at the same time as Cleopatra finds her strength.¹⁷

Example 5

Handel, *Giulio Cesare*, "Piangerò la sorte mia," measures 38–47.

The Rule can also inform analysis of music beyond the eighteenth century. The "Enigma" theme of Elgar's Variations Op. 36 begins with a normative realization of the ascending Rule, interrupted as $\hat{5}$ is harmonized with a $\hat{6}_4$ that does not resolve

¹⁷ The beginnings from Bach's "Goldberg" Variations and Mozart's Piano Sonata in E-flat K. 282 provide good illustrations of the descending Rule of the Octave. Ascents are more likely to appear in segments than as a complete scale.

Violin I

Violin II

Cleopatra

Continuo

Pian - ge - rò, pian - ge - rò la sor - te mi a,

si cru - de - le e tan - to ri a, fin - chè vi - ta in pet - toa vrò;

Example 6

Handel, *Giulio Cesare*, “Piangerò la sorte mia,” measures 1–11.

to the expected V.¹⁸ This discrepancy serves to highlight the conspicuous absence of the dominant chord in the first phrase (one feature of the theme that students occasionally overstate, asking whether the absence of V constitutes Elgar’s “Enigma”). Even for those passages that do not adhere to the Rule of the Octave, knowledge of this standard harmonization provides students with a set of expectations to confirm or reject depending on musical evidence rather than approaching their analytical decisions from scratch. With nothing in their analytical toolkit other than cadences and the Rule of the Octave, students can make sense of a significant amount of music of the common practice period; when approaching different repertoires, the Rule remains a useful background for comparison that allows students to realize the nature of stylistic differences. For example, Janet Bourne uses the Rule of the Octave in a project where students harmonize current popular-music tunes in eighteenth-century style.¹⁹

¹⁸ I am grateful to Robert Gjerdingen for bringing this example to my attention.

¹⁹ Personal communication, May 2017.

Andante
legato e sostenuto ten.

p molto espress. pp cresc. p pp

Example 7
Elgar, Variations Op. 36, measures 1–7.

c) Using the Rule of the Octave to facilitate harmonic hearing

The set of harmonic expectations derived from the Rule of the Octave provides a scaffold to approach not only analysis but also harmonic dictation, which students tend to perceive as a difficult task at first. Our first harmonic transcriptions use combinations of scalar basses and cadences, thus removing the challenge of hearing harmony. Because harmonies are directly inferred from the bass line, the activity renders harmonic hearing somewhat trivial. Yet it provides a comfortable first step to introduce harmonic hearing by directing attention to bass lines, which some listeners find “at first puzzling and seemingly inscrutable” (Karpinski 2000, 120). Once they identify the bass, students find it reassuring that they can simply apply their knowledge of the Rule of the Octave to make educated guesses about chord identification. Surely, having a set of expectations on a given bass does not exhaust the skills for successful harmonic hearing but it does facilitate the task, enabling decisions that consider the aural input as well as a set of highly probable options within a given style. In the passage by Beethoven showed as Example 8, Karpinski suggests the following strategy to identify chords:

After determining the pitches of the bass line, listeners can move on to identifying the inversions of individual chords. Coupling bass line scale degrees with inversion yields root identification and Roman-numeral labels. Through deductive reasoning, the conjunction of bass scale degree and chord inversion leads logically to a single chord root (2000, 121).

Deductive reasoning need not follow the identification of inversions: it can participate in the process directly after the identification of the bass line, thus assisting in the determination of inversions. By mapping the passage onto the Rule of the Octave, students quickly discard ii or iii as viable chords in this context, and

**Example 8**

Beethoven, Piano Sonata in C Major Op. 2, No. 3, third movement, Trio, measures 17–21.

arrive at a $I-V_3^4-I^6$ for the first three measures. Certainly, teachers and students should use this type of stylistically-informed logic as an aid, not a substitute, of harmonic hearing. Students need to consider that $\hat{2}$ can support V_3^4 but also vii^{o6} (as in the version of the Rule of the Octave that Mozart taught to Attwood) or V_4^6 (Beethoven's choice for the passage, although during his time it was a less common alternative than the previous two). Harmonic listening is simplified to a choice between the three chords, depending on whether students hear $\hat{5}$ in the second measure—a task that Beethoven facilitates through register and texture—and/or $\hat{4}$. Similarly, for the $\hat{4}$ in the left hand in measure four, students may wonder whether to assign a ii_5^6 or a V_2^4 . To decide between predominant and dominant functions, I advise students to discriminate between the two alternatives applying the Do-Ti test (Stevens 2017).²⁰

d) Enhancing keyboard skills with the Rule of the Octave

I already mentioned that practice at the keyboard reinforces memorization of the Rule of the Octave while emphasizing proper voice leading. Additionally, learning to play the Rule of the Octave enables students to perform exercises in figured and unfigured bass of considerable difficulty for freshman without previous keyboard experience. After my students learned the Rule of the Octave, we analyzed the theme of Bach's *Goldberg Variations*—most of which can be explained as a succession of subsets of the Rule in G major and D major. Then, I presented them with a bass line that included only those figures *not* derived from the Rule of the Octave (as shown in Example 9) and asked them to play, sing, and harmonize it at the keyboard. This is a task of considerable difficulty for students without previous piano training but it was

²⁰ Students do learn that in this type of neighboring motion they should apply the Rule of the Octave to harmonize the bass depending on the point of arrival—although they do not always remember this rule when they encounter an example like the one from Beethoven's Sonata. The Do-Ti test allows students to locate dominant harmonies by singing (or audiating) either Do or Ti.

accessible to everyone in the class.²¹ Drawing on their knowledge of the Rule of the Octave, students also sang in solfège excerpts from Handel's arias (such as "Piangerò la sorte mia" or "Ombra mai fu") while accompanying themselves at the keyboard playing the continuo parts, which contain several segments of the Rule of the Octave.



Example 9

Bass line from Bach's Goldberg Variations, measures 1–16.

e) Improvising with the Rule of the Octave

The Rule of the Octave provides a starting point to create diverse, structured improvisation exercises. I begin by splitting the class into three groups and singing the three upper voices of the Rule of the Octave as I play the scale at the piano, using a slide (shown as Figure 3a) for visual support.²² Then, I remove part of the information—showing a second slide that contains no information regarding harmony but provides a visual aid for students to track in which point of the scale they are at every moment (Figure 3b)—and ask students to sing again. At this stage, the exercise combines memory with restricted improvisation: students typically remember parts of the line that they have just sang; where memory fails, they draw on their knowledge of the Rule of the Octave to move to a close note of the following chord. After a few rounds up and down the scale following different voice-leading paths, students are ready to incorporate rhythmic patterns. For example, we applied one of the basic rhythmic patterns of the sarabande (shown in Example 10a) to the Rule of the Octave, changing chords every measure.²³ In another improvisation, I used a siciliano rhythm (Example 10b) and asked students to add a neighbor tone of their choice for the sixteenth-note and a chordal leap for the eighth-note of the second measure.

21 An audio track with a performance by an average student from the class (a viola major without previous piano training) is available at <https://vimeo.com/237661409>

22 For small labs/sections, the activity works well without the alto part. This distribution also eliminates the problem of the parallel fifths between alto and soprano towards the end of the ascending scale (eighteenth-century treatises tolerated these fifths in keyboard style).

23 For a demonstration see <https://vimeo.com/237659703> (the audio was recorded in a Freshman Aural skills class during the winter of 2017). The audio begins on Fa in the ascending version of the Rule.

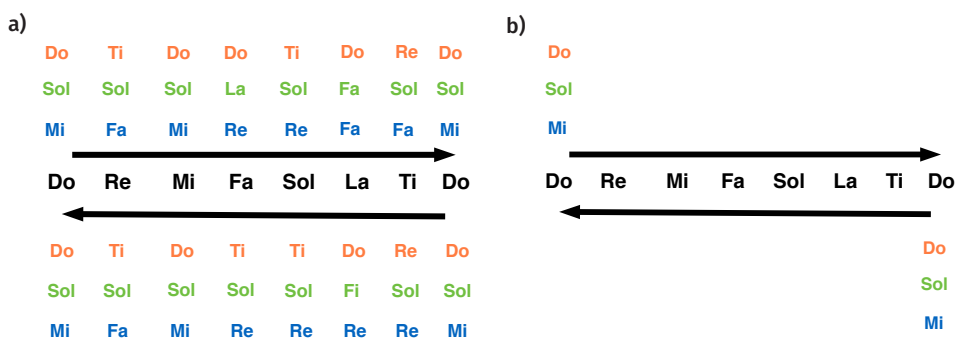
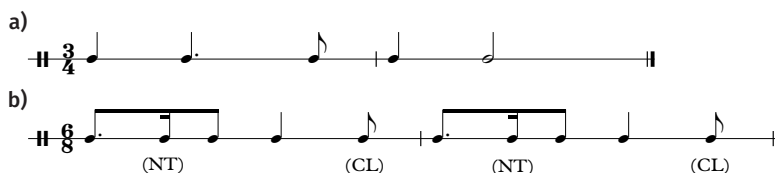


Figure 3

Materials for singing improvisation using the Rule of the Octave.



Example 10

Typical rhythmic patterns of the sarabande and the siciliano used for improvisations.

An informal student survey

I would like to let students speak for themselves regarding the pedagogical benefits of learning harmony with the Rule of the Octave. At the end of the Winter Quarter of 2017, when the period of intense study of the Rule of the Octave was already behind them, I asked my aural skills class about their reactions to this component of the course. The results of my inquiry do not constitute strong empirical evidence of the effectiveness of the method: the sample was small and some students might have answered what they thought I wanted to hear. Yet I believe there is value in their responses. The survey was voluntary and anonymous, and I received 16 responses from a total of 22 students. When asked how often the Rule of the Octave had informed their hearing, singing, writing, or analysis of harmony, most students answered “frequently” or “very frequently;” when asked how useful it had been to memorize the Rule, the majority responded “helpful” or “very helpful” (a summary of their answers appears in Figures 4 and 5). Finally, I asked for a free response about their own perception of the benefits of memorizing the Rule of the Octave. Unsurprisingly,

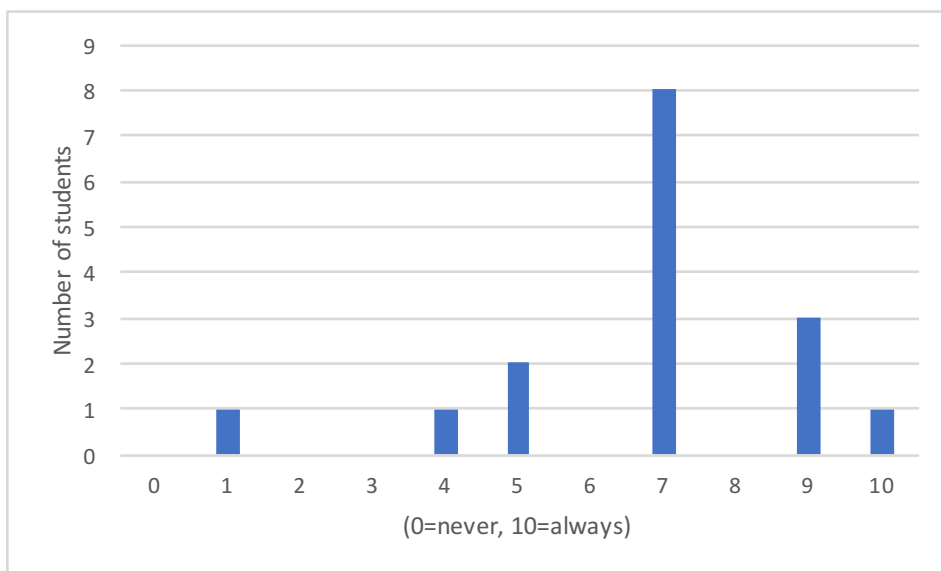


Figure 4

Students' responses to the question "How often has the Rule of the Octave informed your way of hearing, arpeggiating, writing, or analyzing harmony?"

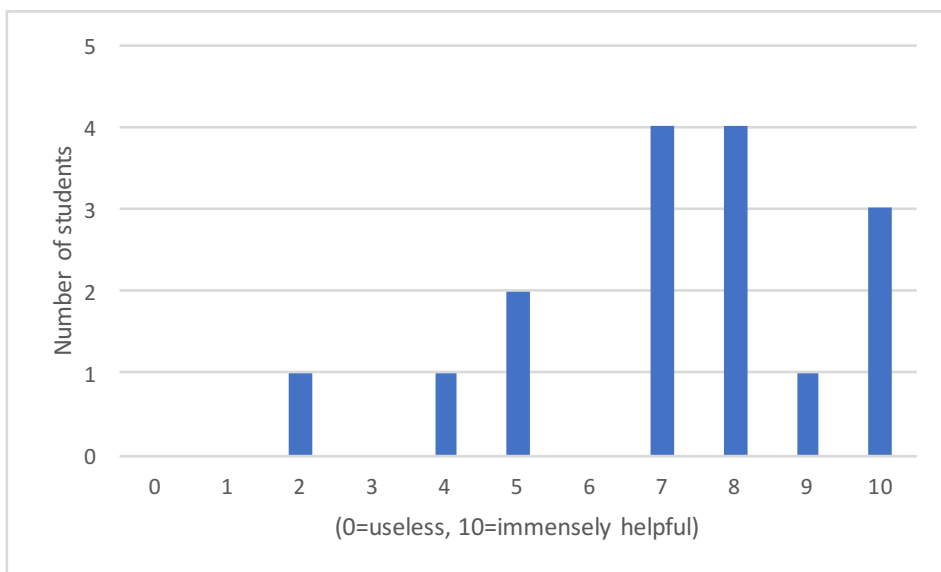


Figure 5

Students' responses to the question "How useful has it been to memorize the Rule of the Octave?"

several responses emphasized learning harmonic progression and voice leading. Some students felt that the predictive power of the Rule of the Octave had improved their listening and analytical skills, and a couple of students were quite enthusiastic about the impact of the method in their musicianship (responses shown in Table 1).

What do you think you have gained by learning the Rule of the Octave?
A better sense of how/why some chord progress in a certain manner.
Better understanding of chord progressions and harmonization.
I learned how harmony progresses.
Helped learn proper voice-leading + a good idea of chord progressions.
Voice leading in chords in relation to scale degree.
How to predict progressions based on the bass line.
It helps me predict what might happen in the music.
It helps on looking at a bass line and being able to get a very likely sketch of the harmonies.
Being able to analyze more quickly given the bass line in common practice period.
Helps analyzing music in a new way.
I understand the relation between the tonic and the dominant better.
Made it easier to understand the Roman numerals and the reasons behind them.
Good understanding of the relationship between figures and harmony.
A great knowledge of period practice harmonization and a standard chord progression which so much music is based off.
An understanding of the way chord progressions generally worked in the Baroque and Classical periods.
I have been able to listen to classical music better.
I love ROTO. I feel that it has helped me a lot as a musician. It is very fundamental and tedious but I'm glad I was taught it, as I understand analysis and composition better now!

Table 1

Open-ended responses (quoted verbatim) from the student survey on the Rule of the Octave.

Conclusion

When music theory students learn the Rule of the Octave, not only do they acquire a chord vocabulary; they also internalize a set of chord progressions, musical collocations that they can subsequently “read,” “write,” “hear,” and “speak.” Empirical evidence shows the importance and effectiveness of memorizing linguistic collocations

for second-language learners; music-language learners can also benefit from similar, targeted memorization activities. As I acknowledged above, mechanical repetition has limited allure for students and educators today and the reader will not be surprised to learn that students do not tend to respond enthusiastically to the first stage of learning the Rule of the Octave. However, after going through this initial step, once students have memorized the Rule in writing, singing, and playing, they have acquired a wealth of knowledge—partly explicit, partly tacit, and largely embodied through singing and playing—about tonal harmony in a relatively short time. This venerable chord progression is a potent tool to teach tonal harmony that we can use with our students today—as Mozart did with Attwood centuries ago. Just as historically-informed performance aims to recover the original sound of musical works as once experienced by their intended audiences, historically-informed pedagogy provides a window into the musical knowledge, skills, and ways of thinking of musicians of the past, with whom we still interact in the twenty-first century classroom. In my experience teaching music theory and aural skills to college freshman, I have found in the Rule of the Octave a tool that is historically informed, cognitively efficient, and that can generate a variety of valuable learning experiences.

Works Cited

- Agawu, Kofi V. 2009. *Music as Discourse: Semiotic Adventures in Romantic Music*. New York: Oxford University Press.
- Arevalo, Jose. 2015. "In Defense of Memorization." *Mysteries and Manners*.
<https://mysteriesandmanners.wordpress.com/2015/06/08/in-defense-of-memorization/>.
Accessed January 18, 2018.
- Boers, Frank and Seth Lindstromberg. 2008. *Teaching Chunks of Language*. Berlin: Helbing.
- Callahan, Michael Richard. 2010. "Techniques of Keyboard Improvisation in the German Baroque and Their Implications for Today's Pedagogy." Ph.D. dissertation, Eastman School of Music, University of Rochester.
- Clendinning, Jane Piper and Elisabeth Marvin. 2016. *The Musician's Guide to Theory and Analysis*. 3rd Edition. New York: W. W. Norton and Company.
- Christensen, Thomas. 1992. "The 'Règle de l'Octave' in Thorough-Bass Theory and Practice." *Acta Musicologica* 64 (2): 91–117.
- Feld, Steven and Aaron A. Fox. 1994. "Music and Language." *Annual Review of Anthropology* 23: 25–53.
- Gentner, Dedre. 2010. "Bootstrapping the Mind: Analogical Processes and Symbol Systems." *Cognitive Science* 34: 752–775.
- Gjerdingen, Robert. 2007. *Music in the Galant Style*. New York: Oxford University Press.
- Gjerdingen Robert, and Janet Bourne. 2015. "Schema Theory as Construction Grammar." *Music Theory Online* 21(2).
http://www.mtosmt.org/issues/mto.15.21.2/mto.15.21.2.gjerdingen_bourne.html.
Accessed January 14, 2018.
- Karpinski, Gary S. 2000. *Aural Skills Acquisition: The Development of Listening, Reading, and Performing Skills in College-level Musicians*. Oxford and New York: Oxford University Press.
- Knop, Sabine de, Frank Boers, and Antoon De Rycker. 2010. *Fostering Language Teaching Efficiency through Cognitive Linguistics*. Berlin: De Gruyter Mouton.
- Mayer, Richard E. 2002. "Rote Versus Meaningful Learning." *Theory into Practice* 41 (4): 226–32.
- Monelle, Raymond. 1992. *Linguistics and Semiotics in Music*. Philadelphia: Routledge.
- Nasrollahi-Mouziraji, Alieh, and Atefeh Nasrollahi-Mouziraji. 2015. "Memorization Makes Progress." *Theory and Practice in Language Studies* 5 (4): 870.
- Novak, Joseph D. 1990. "Concept Maps and Venn Diagrams: Two Metacognitive Tools to Facilitate Meaningful Learning." *Instructional Science* 19 (1): 29–52.
- Piagentini, Susan. 2014. Student Course Packet for Aural Skills II. Bienen School of Music, Northwestern University.
- Sanguinetti, Giorgio. 2012. *The Art of Partimento*. New York and Oxford: Oxford University Press.
- Stevens, Daniel. 2016. "Symphonic Hearing: Mastering Harmonic Dictation Using the Do/Ti Test." *Journal of Music Theory Pedagogy* 30: 111–174.
- Swanson, Richard and Bryan Law. 1993. "Whole-Part-Whole Learning Model." *Performance Improvement Quarterly* 6 (1): 43–53.

- Towler, Luke. 2014. "Deeper Learning: Moving Students Beyond Memorization." *NEA Today*, <http://neatoday.org/2014/11/25/deeper-learning-moving-students-beyond-memorization-2/>. Accessed December 19, 2017.
- Vasiljevic, Zorana. 2014. "Teaching Collocations in a Second Language: Why, What, and How?" *English Language Teachers Association Journal* 2 (2): 48–73.
- Wray, Alison. 2000. "Formulaic Sequences in Second Language Teaching." *Applied Linguistics* 21: 463–489.