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## Haydn's Schemata and Hexachords: Two Analytical Case Studies

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### 1. Introduction<sup>1</sup>

Over the last two decades, the study of historical partimento pedagogy has shed considerable light on the training and musicianship of eighteenth-century European composers. To give just a few examples: William Renwick's edition of a manuscript of Bach's circle shows some of the possible routes to improvising fugue;<sup>2</sup> Robert Gjerdingen and Giorgio Sanguinetti address galant schemata and partimento pedagogy, showing the close relationship between keyboard training and commonplace skeletal patterns embellished in diminutions on the surface;<sup>3</sup> Peter van Tour examines the written-counterpoint curriculum in the Neapolitan conservatories, while Vasili Byros reconstructs stages of the compositional process.<sup>4</sup> Of course, scholars have also explored intersections between schemata and additional branches of research: among other inquiries, Gjerdingen and Janet Bourne collaboratively reflect on analogies between construction grammar in linguistics and musical schema theory;<sup>5</sup> Byros and Olga Sánchez-Kisielewska each address intersections of schemata and topics, highlighting rich relations between musical structure and signification.<sup>6</sup> Such inquiries move away from mystified notions of artworks as uniquely inspired creations, proposing a shared lexicon of patterns of musical communication. Moreover, crucially, this historically informed scholarship is grounded less in speculative theory and more in pedagogical practices. While Gjerdingen presents his

<sup>1</sup> I would like to thank Nicholas Baragwanath, Robert Gjerdingen, and the attendees of the Haydn Society of North America's 2021 meeting for their valuable feedback on prior versions of this paper. Of course, any errors in this speculative line of work are my own responsibility. Thanks are due also to Amy Bradley for her technical help. I have attempted to maintain some of the interactivity of the original forum for the presentation, that is, a dialog between myself as an outsider music theorist presenting to a Zoom room full of musicologists specializing in Haydn.

<sup>2</sup> William Renwick, *The Langloz Manuscript: Fugal Improvisation through Figured Bass* (Oxford: Oxford University Press, 2001).

<sup>3</sup> Robert O. Gjerdingen, *Music in the Galant Style* (New York: Oxford University Press, 2007); Giorgio Sanguinetti, *The Art of Partimento: History, Theory, and Practice* (New York: Oxford University Press, 2012).

<sup>4</sup> Peter van Tour, *Counterpoint and Partimento: Methods of Teaching Composition in Late Eighteenth-Century Naples* (Uppsala: Uppsala Universitet, 2015); 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* 21/3 (2015).

<sup>5</sup> Robert O. Gjerdingen and Janet Bourne, "Schema Theory as a Construction Grammar," *Music Theory Online* 21/2 (2015).

<sup>6</sup> Vasili Byros, "Topics and Harmonic Schemata: A Case from Beethoven," *Oxford Handbook of Topic Theory*, ed. Danuta Mirka, 381–414 (New York: Oxford University Press, 2014); Olga Sánchez-Kisielewska, "Interactions between Topics and Schemata: The Case of the Sacred Romanesca," *Theory and Practice* 41 (2016): 47–80.

schemata as an attempt to reconstruct historical mental patterns, my assumption is that galant schemata are commonplace patterns familiar to historical and present-day listeners who are well versed in the style. My present goal is not to evaluate the schemata's validity for any type of listeners, as sympathetic as I am to that goal.<sup>7</sup> Rather, here I take galant schemata as given analytical tools, assuming that they are typical patterns of eighteenth-century style, accessible in principle even to those unaware of Neapolitan pedagogies. In doing so, I follow in the footsteps of Leonard Meyer and Gjerdingen, who had proposed some of these schemata before Gjerdingen began his work on Neapolitan partimenti.<sup>8</sup> Though Gjerdingen and others present schemata as prototypes with multiple features (e.g., outer-voice skeletons, figured bass sonorities), I focus here on their skeletal soprano melodies, which are most closely tied to Nicholas Baragwanath's recent contribution to the study of Neapolitan pedagogies.

In *The Solfeggio Tradition*, Baragwanath reconstructs a forgotten conceptual framework for eighteenth-century musicians—hexachordal solmization.<sup>9</sup> The traditional Guidonian hexachord *ut-re-mi-fa-sol-la* or *do-re-mi-fa-sol-la* was still relevant to the learning of many eighteenth-century musicians as part of their training in musical rudiments: as Baragwanath argues, plainchant was much more central to eighteenth-century music making and pedagogy than is generally recognized in scholarship.<sup>10</sup> By considering a wealth of practical manuals, Baragwanath reconstructed how musicians fit melodies beyond the confines of a single hexachord through *mutation*, the switching of hexachords. To present-day musicians trained in seven-syllable solmization, losing the

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<sup>7</sup> Whether any present-day expert reconstruction of historical norms actually represents the mental habits of past listeners is of course a speculative question. Gjerdingen's historical schemata and Hepokoski and Darcy's generic norms require validation from multiple angles; for the latter theory, see James Hepokoski and Warren Darcy, *Elements of Sonata Theory: Norms, Types, and Deformations in the Late-Eighteenth-Century Sonata* (New York: Oxford University Press, 2006). The search for galant schemata has been modeled computationally in James Symons's dissertation—see James Symons, "A Cognitively Inspired Method for the Statistical Analysis of Eighteenth-Century Music, as Applied in Two Corpus Studies" (PhD diss., Northwestern University, 2017)—as well as in several recent studies by members of the Music Information Retrieval community—see the sources cited in Aaron Carter-Ényì and Gilad Rabinovitch, "Onset and Contiguity: Melodic Feature Reduction and Pattern Discovery," *Music Theory Online* 27/4 (2021). If schemata can be inferred from a corpus using computational methods, it suggests that they might be acquired through exposure to the style.

<sup>8</sup> To give just two examples, see Robert O. Gjerdingen, *A Classic Turn of Phrase: Music and the Psychology of Convention* (Philadelphia: University of Pennsylvania Press, 1988), and Leonard B. Meyer, *Style and Music: Theory, History, and Ideology* (Philadelphia: University of Pennsylvania Press, 1989), esp. 226–241.

<sup>9</sup> Nicholas Baragwanath, *The Solfeggio Tradition: A Forgotten Art of Melody in the Long Eighteenth Century* (New York: Oxford University Press, 2020).

<sup>10</sup> Baragwanath, *The Solfeggio Tradition*, 37–38. One of Baragwanath's most intriguing ideas is that under the ornate galant musical surface there was a skeletal, conceptual model that resembled plainchant. See, e.g., *The Solfeggio Tradition*, 154 and 212.

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technology of a seventh solfege syllable is more daunting than losing screen time with our favorite gadget; yet if we want to understand how eighteenth-century musicians conceptualized music, Baragwanath’s work is crucial. Joseph Haydn would have received training based in hexachords at two stages of his life: as a choir boy at St. Stephen’s and during his apprenticeship with Nicola Porpora.<sup>11</sup> If Baragwanath’s arguments are valid, we should be able to discover hidden solmization games in Haydn’s pieces, beyond the brief passages that Baragwanath already considered.<sup>12</sup>

A letter that Haydn wrote late in life indicates that he viewed training in thoroughbass, singing, and piano as foundational for a young musician’s skills.<sup>13</sup> At about the same time, Haydn famously complained to Georg August Griesinger that contemporary musicians tried to compose without first learning how to sing. In Griesinger’s words (and Vernon Gotwals’s translation):

He also took exception to the fact that so many musicians now composed who had never learned to sing. “Singing must almost be counted among the lost arts, and instead of song they let instruments dominate.” To Italian song Haydn granted precedence, and he counseled beginning artists to study song in Italy, instrumental music in Germany. Even the climate of Italy contributed to vocal flexibility. Italian singers employed in the chapel of Prince Esterházy altered their voices after a few years’ stay in Hungary. Several returned to Italy, came back again, and lo, their voices had regained their former beauty.<sup>14</sup>

It is difficult to disentangle Haydn from Griesinger in this quote. Griesinger seems not to have understood Haydn’s comment as referring to solmization, but rather related to vocal performance in

<sup>11</sup> Whether the choir boy Haydn would have been taught from a manuscript copy of Johann Joseph Fux’s *Singfundament* (ca. 1710) or one of several other sources, he would have been trained in Guidonian solmization—see Baragwanath, *The Solfeggio Tradition*, 53–54. For a modern edition of Fux’s manual, see Johann Joseph Fux, *Singfundament*, ed. Eva Badura-Skoda and Alfred Mann (Graz: Akademische Druck- u. Verlagsanstalt, 1993). We of course associate Fux’s name with counterpoint, but also have to consider basic musicianship training and the mental models that it creates.

<sup>12</sup> For Baragwanath’s annotated excerpts from Haydn with solmization syllables, see *The Solfeggio Tradition*, 193 Ex. 8.17, 235 Ex. 9.15, 263–264 Ex. 11.8(a-b), and the discussions surrounding those examples. See also 111 Ex. 6.27(a) and 119 Ex. 6.27(b), a didactical example (and its solution) intended to teach the readers hexachordal solmization through the *poco adagio* from Haydn’s String Quartet, Op. 76, no. 3

<sup>13</sup> See the citation and discussion in Felix Diergarten, “‘The True Fundamentals of Composition’: Haydn’s Partimento Counterpoint,” *Eighteenth-Century Music* 8/1 (2011): 57.

<sup>14</sup> Translation from Vernon Gotwals, *Joseph Haydn: Eighteenth-Century Gentleman and Genius, a Translation with Introduction and Notes by Vernon Gotwals of the Biographische Notizen über Joseph Haydn by G. A. Griesinger and the Biographische Nachrichten von Joseph Haydn by A. C. Dies* (Madison: The University of Wisconsin Press, 1963), 61. In the original: “Er tadelte es auch, daß jetzt so viele Tonmeister komponiren, die nie singen gelernt hatten; ‘das Singen sey bey nahe unter die verlornen Künste zu rechnen, und anstatt des Gesanges lasse man die Instrumente dominiren.’ Dem Italienischen Gesang räumte Haydn den Vorzug ein, und er rieth angehenden Künstlern, in Italien den Gesang, in Deutschland die Instrumental-Musik zu studiren. Schon das Klima Italiens trage zur Biegsamkeit der Stimme bey. Italienische Sänger und Sängerinnen, welche bey der Fürstl. Esterhazyschen Kapelle angestellt waren, änderte ihre Stimmen nach dem Aufenthalt von einigen Jahren in Ungarn; mehrere reisten nach Italien zurück, sie kamen wieder, und siehe da, ihre Stimmen hatten ihre vorige Schönheit wieder erlangt.” Georg August Griesinger, *Biographische Notizen über Joseph Haydn* (Hildesheim: Gerstenberg Verlag, 1981 [1810]), 114–115.

the literal sense. In similar fashion, Albert Dies appears to have misunderstood comments that Haydn made about his ability to impress Georg Reutter with his intuitive singing ability without a maestro, because Dies did not know what Haydn meant by the rules of solfeggio.<sup>15</sup> The potential connections between Haydn's compositions and the Neapolitan teacher Porpora have also been addressed recently by Felix Diergarten and Adem Birson:<sup>16</sup> Diergarten focuses on contrapuntal partimento techniques; Birson shows how patterns from Porpora's pedagogical materials and works might have influenced some of Haydn's early compositions. In comparison with students at Neapolitan conservatories, Haydn's apprenticeship with Porpora gave him training equivalent to "no more than the first three or four years of training in solfeggio and the rudiments, together with a few additional years of singing and instrumental playing," not yet the Neapolitan counterpoint and composition curriculum.<sup>17</sup>

There are thus some links between Haydn's training, Neapolitan pedagogies, and associated ways of conceptualizing music. My goal in this paper is not to evaluate the historical evidence directly, but to address hexachordal solmization games as conceptual models apparent in two of Haydn's compositions. One might argue that such analytical evidence is circumstantial at best, and that might well be the case. Nevertheless, this is a productive opportunity to reflect on the relations between structures proposed by music theorists and a historical conceptual model. Moreover, this is an opportunity to examine musical play involving an esoteric model (hexachordal solmization) and conventional schemata that might be familiar, if only implicitly, to the connoisseurs (*Kenner*) and amateurs (*Liebhaber*) well versed in the style.<sup>18</sup> The analysis of both hexachords and schemata will therefore allow me to speculate on layers of playfulness in two pieces by Haydn. My goals in this article are primarily analytical and exploratory, engaging the music and the tools, but I believe that the analyses present a compelling case that the two pieces analyzed are in fact hexachordal solmization games. In addition, I will reflect briefly in conclusion about some potential implications for theory and analysis.

<sup>15</sup> See Baragwanath's discussion of Dies's misunderstanding in *The Solfeggio Tradition*, 302–303.

<sup>16</sup> Diergarten, "True Fundamentals," Adem Merter Birson, "Learning the True Fundamentals from Herr Porpora: Joseph Haydn and Partimento Practice in the 1750s," Lecture presented at Penn State University's Musicology Colloquium, March 18, 2021.

<sup>17</sup> Baragwanath, *The Solfeggio Tradition*, 27. Regarding counterpoint and composition studies in the Neapolitan conservatories, see van Tour, *Counterpoint and Partimento*.

<sup>18</sup> As a theorist presenting an earlier version of this paper to historical and theoretical Haydn specialists, I was pleased by the extent to which our stylistic intuitions coincided—we could discuss Haydn's manipulations of idiomatic patterns, with or without explicit knowledge of labels like Prinner or High- $\hat{2}$  drop—indicating a more-or-less common understanding of these patterns by modern scholars specializing in this period.

## 2. Eighteenth-Century Solmization and High- $\hat{2}$ Drops

Before proceeding with the analytical case studies, a summary of Baragwanath's detailed reconstruction of hexachordal solmization is in order.<sup>19</sup>

The image shows two musical staves in G major (one sharp). The first staff represents an ascending scale with solmization syllables: do, re, mi, fa, (do), re, mi, fa, sol, (la). The second staff represents a descending scale with solmization syllables: la, sol, fa, mi, (re), do, la, sol, fa, mi, re, do. Boxes are drawn around the notes do, re, mi, fa, sol, and do, indicating the starting notes of hexachords. Syllables in parentheses indicate mutations.

Example 1. Solmizing a major scale up and down based on interlocking hexachords.

Example 1 transposes and paraphrases Baragwanath's example 6.4(a), showing how to solmize an E $\flat$  major scale up and down based on interlocking hexachords:<sup>20</sup> In major, mutations in ascending melodies are based on solmizing *re* instead of *sol* or *re* instead of *la*, depending on the position within the scale; in descending melodies, mutations happen by using *la* instead of *re* or *la* instead of *mi*, depending on the position. Solmization syllables without parentheses in Example 1 represent syllables actually solmized; those in parentheses would generally not be used, unless the melodic segment sits comfortably within a hexachord without requiring a mutation. Boxes in Example 1 represent the starting notes of hexachords on B $\flat$  and E $\flat$ . To present-day eyes, this seems unwieldy, yet it offers us a window into eighteenth-century musicianship and ways of conceptualizing music.

There was not a one-to-one relation between notes on the musical surface and solmization syllables: some embellishing notes were performed as melismas respective to skeletal notes receiving an independent syllable. Thus, syllables explicitly encoded the relation between skeletal notes—often

<sup>19</sup> A good starting point for learning galant hexachordal solmization for interested readers might be *The Solfeggio Tradition*, Chapters 6–8. My present summary of Baragwanath's reconstruction simplifies certain details, attempting to cover what is most relevant to the present paper.

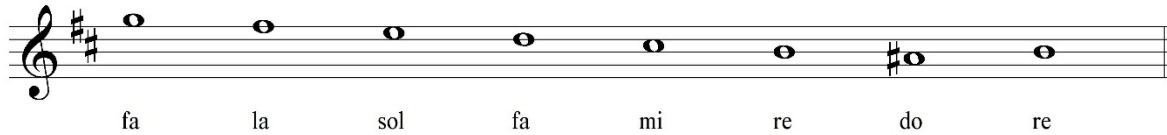
<sup>20</sup> See Baragwanath, *The Solfeggio Tradition*, 90.

equivalent to Gjerdingen's schema core tones—and surface diminutions. According to Baragwanath, "The art of solfeggio . . . taught how to elaborate simple syllabic note patterns akin, but not identical, to Gjerdingen's (2007) Galant schemata, enabling those who had progressed through additional lessons in partimento and counterpoint to harmonize and notate them as finished compositions."<sup>21</sup> Baragwanath refers to melismas subsumed under the initial tone as representing the *Amen rule* and to ones subsumed under the goal note as the *appoggiatura rule*. Thankfully, in my second case study from Haydn's Quartet Op. 50, no. 6, a notational trick (explained below) will provide some degree of confidence as to which tones carry a syllable and which ones are ornamental and subsumed under the skeletal tone's syllable.

In minor, what to us are successive scale degrees  $\hat{7}-\hat{1}-\hat{2}-\hat{3}-\hat{4}-\hat{5}-\hat{6}$  might have been solmized in some contexts as *do-re-mi-fa-sol-la-fa* without mutations (see Example 2): the leading tone *do* maintains its solmization syllable despite being sharpened (rather than, say, being solmized *mi* as the lower member of a *mi-fa* semitone). That  $\hat{6}$  is solmized here *fa* has to do with the traditional hexachordal solmization rule, "*Una nota super la semper est canendum fa*," that is, "one note above *la* is always solmized *fa*"—henceforth the "*fa-above-la*" rule. If this model seems abstract to us, we should consider a famous musical passage that possibly invokes it: Giovanni Battista Pergolesi's parallel setting of the lyrics "Cuius animam gementem" and "contristatam et dolentem" in the eponymous movement from his *Stabat Mater* (not shown) does not just represent an advanced theoretical topic such as a highly chromatic  $b_{vii}$  sonority, as we might teach students nowadays; rather, a basic minor-mode solmization pattern, *re-mi-fa-sol-la-fa-do-re*, is realized respective to C minor, then  $B\flat$  minor. The aria's subsequent shift to  $A\flat$  major maintains a shared hexachord with the preceding  $B\flat$  minor (i.e.,  $B\flat$  is initially tonic *re* while A, the leading tone to  $B\flat$ , or  $A\flat$ , the tonic of  $A\flat$  major, are both *do*.) As with other issues, my presentation simplifies Baragwanath's reconstruction, yet for present purposes, Example 2 should suffice as an account of the minor mode, with its disorienting (to us) tonic *re*.<sup>22</sup>

<sup>21</sup> Baragwanath, *The Solfeggio Tradition*, 130.

<sup>22</sup> On the minor mode, see Baragwanath, *The Solfeggio Tradition*, 98–103.

Example 2. Solmizing a minor scale.<sup>23</sup>

Before moving to the analytical case studies, another commonplace style pattern and its solmization context needs to be introduced: Gjerdingen's High- $\hat{2}$  drop (see Example 3). This embellishment is an overshoot from a central melodic layer, whether we conceptualize it as a layer of core tones of a galant schemata or in terms of "melodic fluency" (stepwise motion) among skeletal tones.<sup>24</sup> The High- $\hat{2}$  is often involved in a peripheral layer of hidden polyphony (or polyphonic melody), while the  $\hat{4}$ - $\hat{3}$  is often part of the main skeletal melodic thread. Baragwanath's reconstruction suggests that the High- $\hat{2}$  is a type of *Inganno* or deceptive usage of solmization syllables: rather than creating a stepwise motion with scale degrees  $\hat{5}$ - $\hat{4}$ - $\hat{3}$  respective to the most local tonic, the syllable *sol* is deceptively taken from a hexachord that lies a fifth above it (compare Example 3 to the scalar layout of Example 1).<sup>25</sup> As I had discussed in a recent article—without being aware yet of the details of Baragwanath's reconstruction—the melodically peripheral High- $\hat{2}$  or High- $\hat{6}$  drop is often a point of idiomatic incongruence, in which a skeletal note ( $\hat{4}$  or  $\hat{1}$ , respectively)—or a principal core tone in Gjerdingen's sense—is not on a point of metric stress (such as a downbeat) nor displaced from it by an accented dissonance.<sup>26</sup> As a somewhat informal observation, schema core tones tend

<sup>23</sup> Compare to Baragwanath, *The Solfeggio Tradition*, e.g., 116 Ex. 6.17(b) and 117, Ex. 6.20(b).

<sup>24</sup> For a discussion of melodic fluency in Schenker's writings, see William Pastille, "The Development of the *Ursatz* in Schenker's Published Works," *Trends in Schenkerian Research*, ed. Allen Cadwallader, 71-85 (New York: Schirmer Books, 1990). For discussions of melodic fluency in galant schemata, see Andreas Metz, "Melodic Fluency in Keyboard Menuet Improvisation," Paper presented at the 9<sup>th</sup> European Music Analysis Conference, Strasbourg, 2017; see also the discussion of schemata and melodic fluency in Gilad Rabinovitch, "Hidden Polyphony, Linear Hierarchy, and Scale-Degree Associations in Galant Schemata," *Indiana Theory Review* 36/1-2 (2020): 114-166.

<sup>25</sup> For a succinct explanation of *Inganno* in Renaissance polyphony, see Peter Schubert, *Modal Counterpoint: Renaissance Style*, 2nd ed. (New York: Oxford University Press, 2007), 306. Some of the imitation points discussed below in Haydn's Op. 50, no. 6, first movement, may be considered a type of "deceptive imitation" or *fuga d'inganno* as surveyed by Schubert, since a motive repeated in inexact imitation nevertheless maintains its solmization syllables.

<sup>26</sup> In *A Classic Turn* (see, e.g., 64 figure 4-4), Gjerdingen shows how the pairs of events of the  $\hat{1}$ - $\hat{7}$ ... $\hat{4}$ - $\hat{3}$  schema, later renamed Meyer, often encircle a metric boundary such that  $\hat{1}$  and  $\hat{4}$  precede the boundary. In Rabinovitch, "Hidden Polyphony," 146, I suggest that this might be indicative more broadly of the metric behavior of skeletal  $\hat{1}$  and  $\hat{4}$  in galant schemata in general. Equipped with hexachordal solmization, one might say that this is a common constellation for skeletal *fa* as part of a *fa-mi* semitone. It is almost certain that the High- $\hat{6}$  or High- $\hat{6}$ -like gestures have different metric profiles depending on their context—compare to Danuta Mirka, *Hypermetric Manipulations in Haydn and Mozart: Chamber Music for Strings, 1787-1791* (New York: Oxford University Press, 2021), e.g., 236fn.19 and 340-341, but my

either to fall on points of relative metric stress (such as beats 1 and 3 in 4/4) or to be displaced from them by an accented dissonance.<sup>27</sup> One common exception is skeletal scale degrees  $\hat{1}$  and  $\hat{4}$ , at least when they are part of a *fa–mi* skeletal semitone. The derivation of Example 3 suggests that skeletal  $\hat{4}$  would be embedded in meter as if it is a passing tone carrying an equal value to the preceding consonant tone; in practice, this skeletal scale degree is often shortened and moved closer to a metric boundary.

The musical notation for Example 3 consists of a single melodic line on a treble clef staff. The key signature has one flat (F major), and the time signature is common time (C). The notes are: Sol (G4), fa (F4), mi (E4), (High-2) (G5), fa (F4), mi (E4). Above the notes are scale degree numbers: 5, 4, 3, (High-2), 4, 3. The notes are grouped into two measures of three notes each, with a double bar line between the two groups.

Example 3. Gjerdingen's High- $\hat{2}$  as an *Inganno*.<sup>28</sup>

To make this discussion less abstract, let us look at several measures from Carl Heinrich Graun's aria "Du Held, auf den die Köcher" from the oratorio *Der Tod Jesu* (Example 4a). Several outer-voice tritone resolutions are embellished through a typical flourish from the High- $\hat{2}$  to the skeletal  $\hat{4}$ – $\hat{3}$  resolution respective to a highly localized tonic.<sup>29</sup> Example 4b presents a reduction of Graun's passage into four tritone resolutions, which are a kernel of many galant schemata and also constitute Gjerdingen's Comma schema in isolation; Example 4c shows how this kernel can appear as a passing tone with an optional prefix,  $\hat{5}$ , such that each Comma is represented by *sol–fa–mi*;

present focus is on the High  $\hat{2}$ . See also the presentation of the High- $\hat{2}$  and High- $\hat{6}$  drops in Gjerdingen, *Galant Style*, 74 and 162.

<sup>27</sup> Regarding the tendency for metric (or temporal) regularity associated with schema core tones, see Symons, "Cognitively Inspired Method." Compare also to Trevor Rawbone and Steven Jan, "The Butterfly Schema in the Classical Instrumental Style: A Product of the Tendency for Congruence," *Music Analysis* 39/1 (2020): 85–127. While Symons and Rawbone and Jan have more formal entry points than that of my present paper, both studies imply that schemata are closely associated with regularity (or congruence).

<sup>28</sup> Compare to Baragwanath, *The Solfeggio Tradition*, 122 Ex. 6.28(a).

<sup>29</sup> Eighteenth-century musicians had highly localized notions of tonal centers and shifts between them, unlike more recent monotonal approaches to tonal music. For two of many helpful discussions of these issues, see Joel Lester, *Compositional Theory in the Eighteenth Century* (Cambridge, MA: Harvard University Press, 1992), 82–87; and Vasili Byros, "Foundations of Tonality as Situated Cognition, 1730–1830: An Enquiry into the Culture and Cognition of Eighteenth-Century Tonality with Beethoven's 'Eroica' Symphony as a Case Study" (PhD diss., Yale University, 2009).



Example 4d reduces the passage to the span between the High- $\hat{2}$  and the skeletal  $\hat{4}-\hat{3}$ , which would also be represented by *sol-fa-mi*. The repertoire of idiomatic possibilities for the High- $\hat{2}$  drop is constrained: my intentionally unidiomatic recomposition, Example 4e, shows how keeping the same skeletal structure while retrograding the surface deviates from the style.<sup>30</sup> In the forum in which the work-in-progress version of this paper was presented, we seem to have shared intuitions about the idiomatic quality of Graun's passage and the intentionally unidiomatic quality of my recomposition. In fact, my recomposition is somewhat similar to one of Haydn's manipulations in the minuet *al roverso* to be discussed below.

Example 4a. Graun, "Du Held, auf den die Köcher" from *Der Tod Jesu*, mm. 6–7 (reduced by the author, galant core tones  $\hat{4}-\hat{3}$  respective to a local tonic and High- $\hat{2}$  peripheral melodic element annotated).

<sup>30</sup> For an illuminating discussion of surface patterns and their usage, see Gjerdingen and Bourne, "Construction Grammar."

Example 4b. Reduction of the passage to four skeletal tritone resolutions (or instances of the Comma schema respective to a local tonic).

Example 4c. Reduction of the passage into four tritone resolutions with prefixes, contextualizing the tritone-forming note as a passing tone.

Example 4d. Reduction of the passage to High-2-based melodic frameworks.

The image shows two systems of musical notation for piano accompaniment. The first system consists of two staves (treble and bass clef) in a key signature of two flats and common time. The treble staff contains a sequence of eighth notes with fingerings: 4, 3, 3, 4, 3, 4, 3, 4, 3, 3, 3. Above the staff, there are labels: "(High-2)" above the first group, "3" above the second, "(High-2)" above the third, and "(High-2)" above the fourth. The bass staff contains a sequence of quarter notes: G2, F2, E2, D2, C2, B1, A1, G1. The second system also consists of two staves. The treble staff has eighth notes with fingerings: 3, 4, 3, 3, 3. Above the staff, there are labels: "3" above the first group, "4" above the second, "(High-2)" above the third, and "3" above the fourth. The bass staff contains a sequence of quarter notes: G2, F2, E2, D2, C2, B1, A1, G1.

Example 4e. My intentionally unidiomatic recomposition of Graun's embellished *fa-mi* skeletal resolutions.

The image shows musical notation for a vocal line and piano accompaniment. The key signature is three sharps (F#, C#, G#) and the time signature is 3/4. The vocal line is on a treble clef staff with lyrics: "(Sol) fa mi re do". Above the vocal line, there are labels: "(High-2)" above the first measure, "(Comma) Complete Cadence" above the second measure, and "4 3 2 1" above the notes of the second measure. The piano accompaniment is on a grand staff (treble and bass clefs). The bass staff contains a sequence of quarter notes: G2, F2, E2, D2, C2, B1, A1, G1. The treble staff contains a sequence of quarter notes: G4, F4, E4, D4, C4, B3, A3, G3.

Example 4f. A hint by Durante for realizing the partimento Gj. 4 from his *Partimenti diminuiti*.

The image shows musical notation for a vocal line and piano accompaniment. The key signature is three sharps (F#, C#, G#) and the time signature is 3/4. The vocal line is on a treble clef staff with lyrics: "(Sol) fa mi re do". Above the vocal line, there are labels: "(Comma) Complete Cadence" above the second measure, and "4 3 2 1" above the notes of the second measure. The piano accompaniment is on a grand staff (treble and bass clefs). The bass staff contains a sequence of quarter notes: G2, F2, E2, D2, C2, B1, A1, G1. The treble staff contains a sequence of quarter notes: G4, F4, E4, D4, C4, B3, A3, G3.

Example 4g. Another hint by Durante for realizing the partimento Gj. 4.

In exploring melodic embellishments on tritone-resolution kernels common to many galant schemata, I wrote as follows about written-out diminutions by Johann Joachim Quantz, Francesco Durante, Georg Philipp Telemann, and Antonio Salieri:

By internalizing idiomatic diminutions, eighteenth-century trainees (and presumably also highly enculturated listeners) would have formed mental representations of conventional melodic paths and points of convergence. As present-day theorists, we can attempt to reconstruct these creative paths and speculate on their significance for linear analysis.<sup>31</sup>

Examples 4f and 4g reproduce parts of diminutions hints by Durante for realizing his partimento Gj. 4 from his *partimenti diminuiti*.<sup>32</sup> Had I had access to Baragwanath's reconstruction while working on that article, I might have alluded to a *(sol)–fa–mi* conceptual model rather than "conventional melodic paths and points of convergence" in the minds of historical musicians or listeners. In other words, hexachordal solmization creates an equivalence between diminution paths that share the same implied syllables and skeletal structures. Whether *sol* is  $\hat{5}$  or High- $\hat{2}$ , the *fa–mi* or  $\hat{4}–\hat{3}$  skeleton likely emerges as a prevalent kernel in galant usage.<sup>33</sup>

The typical *Inganno* of the High- $\hat{2}$  drop thus takes a  $\hat{5}–\hat{4}–\hat{3}$  pattern and moves the *sol* to a higher hexachord (Example 3) such that  $\hat{5}$  is replaced by High  $\hat{2}$ . In Wolfgang Amadeus Mozart's aria "Non so più" from *The Marriage of Figaro*, Cherubino's impassioned singing creates a more extravagant deception, which adds a twist to the regular *Inganno*. Example 5a presents an analysis of the passage into schemata: Cherubino's opening four sung measures imply the presence of Gjerdingen's Sol–Fa...Fa–Mi scale-degree schema, which I relabel here  $\hat{5}–\hat{4}... \hat{4}–\hat{3}$  so as to differentiate between syllables and schema core tones. Example 5b, which contains my recomposition, presents a schematic implication not realized: a complete  $\hat{5}–\hat{4}... \hat{4}–\hat{3}$  pattern. The juxtaposition of these two examples suggests that Mozart performs a deception upon a deception: instead of just using the implied *sol* from the wrong hexachord (F5), he also moves the implied *fa–mi* to the upper, deceptive hexachord. In other words, for Cherubino, the usual *Inganno* of moving the syllable *sol* only

<sup>31</sup> Rabinovitch, "Hidden Polyphony," 154.

<sup>32</sup> See the online edition in Gjerdingen, *Monuments of Partimenti*, n.d., <https://partimenti.org/partimenti/index.html>. Durante's *partimenti diminuiti* can be found at the following direct link: [https://partimenti.org/partimenti/collections/durante/durante\\_diminuiti.pdf](https://partimenti.org/partimenti/collections/durante/durante_diminuiti.pdf).

<sup>33</sup> In Gilad Rabinovitch, "Gjerdingen's Schemata Reexamined," *Journal of Music Theory* 62/1: esp. 63–67, I referred to tritone resolutions as "atoms" within the many schema prototypes that contain them.

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(Example 5b) is not enough: he goes out of his way and subverts a conventional schema. Thus, Cherubino literally does not know what he is doing with his solmization syllables, in a way directly representative of Lorenzo da Ponte's text. The esoteric study of solfeggi would have been clear only to musicians trained in it, yet I believe that listeners experienced in this style would at least implicitly recognize the subverted implication of Example 5b when listening to Mozart's aria.

Example 5b musical score. The score is in G major (one sharp) and 4/4 time. The melody is written in the treble clef, and the bass line is in the bass clef. The lyrics are: Sol mi do sol fa la fa re fa mi. Above the melody, there are five boxes representing schema core tones. The first box is labeled '5' and covers the notes Sol, mi, do, sol. The second box is labeled '4' and covers the notes fa, la. The third box is labeled '4' and covers the notes fa, re. The fourth box is labeled '(High 2????)' and covers the notes fa, mi. The fifth box is labeled '(schema subverted) X' and covers the final note, mi. Lines connect the solmization syllables to the notes they correspond to.

Example 5a. "Non so più" from *The Marriage of Figaro*, Mozart's original mm. 1–5 (reduced); boxes represent schema core tones, lines connect solmization syllables to the pitches to which they correspond.

Example 5a musical score. The score is in G major (one sharp) and 4/4 time. The melody is written in the treble clef, and the bass line is in the bass clef. The lyrics are: Sol mi do sol fa la fa (sol) fa mi. Above the melody, there are five boxes representing schema core tones. The first box is labeled '5' and covers the notes Sol, mi, do, sol. The second box is labeled '4' and covers the notes fa, la. The third box is labeled '4' and covers the notes fa, (sol). The fourth box is labeled '(High-2)' and covers the notes (sol), fa. The fifth box is labeled '3' and covers the notes fa, mi. Lines connect the solmization syllables to the notes they correspond to.

Example 5b. My recomposition, fulfilling the schematic implication with a complete  $\hat{5}-\hat{4} \dots \hat{4}-\hat{3}$  schema.

I have mentioned above that melodic diminutions would have been subsumed under skeletal notes receiving a solmization syllable—this is also reflected in Examples 5a and 5b. Note that in m. 3, subsuming B $\flat$  as an appoggiatura under the A $\flat$ 's *fa* coincides with the word "faccio" in the aria's text. In addition, the setting of the words "Ogni donna mi fa palpitar" in mm. 11–12 of the aria (not shown),

where "palpitar" is set to B $\flat$ –A $\flat$ –G, implies a solmization of (sol)–fa–mi, creating a pun involving the poetry's "mi fa" and the syllables fa-mi.<sup>34</sup>

### 3. First Case Study: Haydn's Minuet al roverso

Haydn's minuet *al roverso* is a delightful example for the interplay of galant schemata, a compositional conceit (retrograde), and hexachordal solmization.<sup>35</sup> In Example 6, I have outlined how the G-major scale of Haydn's melody can be construed as a combination of hexachords on D and G: this example can serve as a reference for some of the tricks to be discussed below. Baragwanath (pers. comm.) observed in response to the work-in-progress version of this paper that the minuet as a whole can be viewed as embellishments on an ascending and descending hexachord, G–A–B–C–D–E–D–C–B–A; A–B–C–D–E–D–C–B–A–G—see Examples 7a and 7b for two possible variants of the underlying model on this view. Since there was no 1-to-1 correspondence between notes and solmization syllables—rather, diminutions were solmized as melismas respective to skeletal tones—his explanation is elegant and attractive, and Example 8a fits these syllables to the melody of Haydn's minuet. Note, for instance, that the *sol* melisma of mm. 7–8 connects the main hexachord's *sol* into the wrong *sol* in the hexachord above it, that is, the typical *Inganno* of the High- $\hat{2}$ . As compelling as Baragwanath's explanation (pers. comm.) is, I believe that Haydn manipulates two kinds of templates: the antiquated rising and falling hexachord as well as "modern" galant schemata.<sup>36</sup> In addition, we have to consider the special constraints posed by the retrograde device and possible clues for listeners that it is present.

<sup>34</sup> See also Baragwanath's observation regarding Mozart's solfeggio G $\flat$ 5352 in *The Solfeggio Tradition*, 271. He argues that Mozart's exaggerated flourish on the syllable *mi* pokes fun at the vanity of Italian singers, whose *do-re-ME* reflected their self-centeredness. Mozart's solfeggio G $\flat$ 5352 is a version of the "Christe eleison" solo from his Mass in C minor, K. 427.

<sup>35</sup> For a detailed recent discussion of the minuet and its contexts, see Balázs Mikusi, "More than a Copy: Joseph Haydn's Menuet *al roverso* in Context," *HAYDN: The Online Journal of the Haydn Society of North America* 3/2 (2013).

<sup>36</sup> As Baragwanath (pers. comm.) observes, some embellishments (see e.g. m.3 and m. 5 in Example 8a) are old-fashioned "accents" postponing the arrival of the main note (see also *The Solfeggio Tradition*, 137–138). In my recomposition into a modern galant frame in Example 8b, core tones not delayed by a High- $\hat{2}$  (nor involved in acceleration) are metrically stressed—as stated above, it seems that the general tendency for most core scale degrees is to be either stressed or delayed by an accented dissonance. In other words, part of the regularizing of the recomposition had to do with omitting the old-fashioned "accents" while casting the passage into a galant-schematic mold.

Example 6. The G major scale as a combination of hexachords on D and G.

Example 7a. An ascending and descending hexachord as conceptual framework for Haydn's minuet.

Example 7b. A slight modification of the hexachordal model, representing the acceleration of mm. 8–9 and 12–13.

Let us first consider a constraint that the retrograde compositional conceit poses. In order to create a pattern that would retrograde into an idiomatic skeletal  $\hat{3}-\hat{2}-\hat{1}$  or *mi-re-do* cadential

descent to the tonic note at the end of the second reprise, mm. 18–20, with one skeletal note per measure, Haydn had to insert m. 3, which allows mm. 1–3 to retrograde to mm. 18–20. Of course, both m. 3 and m. 18 fulfill the *mi* slot of the hexachordal template (see Examples 7a, 7b, and 8a). From the point of view of commonplace schemata, however, m. 3 is an interpolation into the Meyer or  $\hat{1}-\hat{7} \dots \hat{4}-\hat{3}$  schema (compare to mm. 1–4 of my recomposition in Example 8b, which casts the minuet's melody into a conventional mold). Thus, there is conflict between creating a pattern that would work as a retrograde and an idiomatic Meyer template. Haydn's dynamics (not shown) emphasize the onset of the second pair of Meyer schema events,  $\hat{4}-\hat{3}$ , as well as the onset of the Prinner (compare Example 8a to Example 8b).<sup>37</sup> If we recognize the conventional Meyer schema as a salient feature of the surface, this suggests solmizing each semitone of the Meyer as *fa-mi*, conflicting with a single ascending hexachord starting on *do* in m. 1.<sup>38</sup> In this case, the galant Meyer obscures the more antiquated hexachordal model, perhaps poking fun at it.

While the *fa-mi...fa-mi* parallelism of the Meyer schema does not align with the hexachord, the Prinner connecting to a HC suffix,  $\hat{6}-\hat{5}-\hat{4}-\hat{3}-\hat{2}$  (*la-sol-fa-mi-re*) in mm. 6–10 clearly outlines a descent through five of the hexachord's notes. Here there is a more transparent connection between the schematic skeleton and solmization syllables. Haydn repeats m. 8 in m. 9, which is puzzling, even if it creates a five-measure+five-measure balance: a High- $\hat{2}$  followed by schema core tones  $\hat{4}$  and  $\hat{3}$  is expected to proceed immediately to skeletal (low)  $\hat{2}$  in such a context—that is, one might expect m. 8 to move directly into m. 10, without the repetition of m. 9 (the recomposition in Example 8b omits this repetition). The repetition of the High- $\hat{2}$  drop sounds almost as if it were an intentional mistake, while also making room for an evenly paced descent through a hexachord, with the syllables *fa* and *mi* represented through two measures (refer back to Examples 7a and 7b). Though this repetition is unusual, the metric embedding of the High- $\hat{2}$  within each measure is conventional by itself: as suggested, this is a peripheral melodic element (corresponding to *sol* from a higher hexachord) that often occupies a strong metric position, while schema core tone  $\hat{4}$  (solmized *fa*) occupies a weaker metric position.<sup>39</sup>

<sup>37</sup> Regarding schemata as hypermetric templates and their significance as one perceptual factor out of many, see Danuta Mirka, *Hypermetric Manipulations*, e.g., 49 and 281. The minuet *al roverso*, of course, lends itself to a Mirka-style dynamic (hyper)metric analysis, but I will not pursue this line of reasoning here.

<sup>38</sup> Regarding the Meyer schema as *fa-mi...fa-mi*, see Baragwanath, *The Solfeggio Tradition*, e.g., 232.

<sup>39</sup> As Baragwanath (pers. comm.) remarks, Haydn's mm. 7–9 (Example 8a) with their *Inganno* create a stepwise "sol mi fa | sol fa mi | sol fa mi" conceptual model, accelerating the pace and concealing somewhat the descending hexachordal



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Example 8a. Haydn, Minuet *Al roverso* from Symphony Hob. I: 47, minuet proper, melody only, highlighting an underlying ascending and descending hexachord model.

Example 8b. My recomposition of Haydn's melody, fitting it into a conventional galant mold through galant schemata (without the retrograde conceit).<sup>40</sup>

The unusual repetition of m. 8 in m. 9 is helpful for drawing listeners' attention to the difficult-to-perceive retrograde when the whole first reprise is played backwards, such that mm. 8–9 are

scaffolding. In other words, musicians could have conceptualized the leaps on the musical surface through a stepwise mental model (D B C | D C B | D C B). See also my comments below about the retrograded version of this pattern in mm. 12–14 and the tension between the "stepwise" conceptual model and the subversion of a conventional schema.

<sup>40</sup> The F $\sharp$  in measure 11 of this recomposition is solmized *fa* as an instance of *fa*-above-*la*.

retrograded into mm. 12–13. Gretchen Wheelock writes about this spot as follows: "The repeated measure of large leaps and accelerated dynamic contrasts (mm. 8–9) is especially prominent when heard back to back with its retrograde in the minuet: heard in reverse, the relationships of V and I and of downbeat and upbeat undergo surprising alterations that alert the listener to the hidden game."<sup>41</sup> My present analysis resonates with hers while adding information from the lens of schemata and hexachords. Unlike the idiomatic metric embedding in m. 8 and m. 9 of the High- $\hat{2}$ 's *sol-fa-mi* pattern, the retrograde pattern of m. 12 and m. 13 is unusual, even if those trained in solfeggi would have recognized the stepwise mental model *mi-fa-sol* for the pitches B<sub>4</sub>–C<sub>5</sub>–A<sub>5</sub>. In fact, mm. 12–13 are probably the most striking in the entire minuet: the retrograde of the High- $\hat{2}$  melodic complex deviates from a commonplace manner of embedding scale degrees within meter. Even though some attendees of the paper presentation found the pitch succession B<sub>4</sub>–C<sub>5</sub>–A<sub>5</sub>–G<sub>5</sub>–F<sub>5</sub>–D<sub>5</sub> (i.e., skipping from m. 12 directly to m. 14 in Example 8a) idiomatic or at least passable, there seemed to be agreement at least that the repetition of m. 12 in m. 13 is unusual. In other words, as much as our Q&A interactions do not represent a controlled trial, we share at least some intuitions about this challenging passage. Thus, precisely after the point of retrograde, it seems as if Haydn planted a strong hint for experienced listeners that a retrograde had just begun: from my present angle, this seems to have been done by deviating from a conventional usage pattern of scale degrees within meter.

I mentioned that retrogrades are difficult to perceive, which is supported in present-day cognitive studies. In fact, Haydn's retrograde minuet (in its keyboard version from the sonata Hob. XVI: 26) was used by Elizabeth Hellmuth Margulis as a stimulus for an experiment on the perception of repetition. She writes:

Participants in my study on repetition detection (Margulis, 2012) failed to register m. 11 as a repetition of m. 10 when exposed to the passage . . . [=minuet proper], despite that they follow immediately on each other's heels within the amusing structure of the movement, according to which the second part restates the first in retrograde. What explains the participants' failure to identify this repetition when other immediately successive repetitions of measure-length units (such as the ones in mm. 8 and 9) were identified without problem? Perhaps the acoustic differentiation between the performance of m. 10 and the performance of m. 11 was greater—performers tend to slow down at the end of phrases (m. 10), for example, but not at their beginnings (m. 11). But an alternative, if related explanation simply observes that the notes in

<sup>41</sup> Gretchen A. Wheelock, *Haydn's Ingenious Jesting with Art: Contexts of Musical Wit and Humor* (New York: Schirmer Books, 1992), 67–68.

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m. 10 serve as an ending thing, but the notes in m. 11 serve as a beginning thing. According to this explanation, syntactic function is so salient that the beginning-end distinction makes m. 10 and m. 11, for all intents, separate "things" despite their surface similarity.<sup>42</sup>

Margulis also reports that participants did not mention the retrograde technique in the free-response portion of her study nor in the debriefing portion, though they were not asked about the technique explicitly.<sup>43</sup> Margulis's speculations about her participants' failure to notice immediate repetition are convincing, demonstrating the productive back-and-forth of running cognitive experiments and theorizing about their results. The tonal cognition of Margulis's participants, however, is based in the present-day Tower of Babel of tonal dialects: we have a semblance of mutual intelligibility between tonal musics as far apart as Monteverdi, Rihanna, or Maslanka, say, but most present-day listeners may not have sufficient exposure to eighteenth-century music so as to notice small idiomatic violations like a retrograded High- $\hat{2}$ .<sup>44</sup> My intention here is not to reinforce hierarchies of genre and taste, only to observe that present-day experiment participants, often undergraduate students, may be highly experienced and sensitive listeners to tonal genres but not so experienced with eighteenth-century style.

Haydn's minuet *al roverso* thus displays playfulness on both conventional schemata and hexachordal solmization, representing different types of insider knowledge along with a special compositional conceit. In some cases, such as the Prinner connecting to a HC at the end of the first reprise, both modes of engaging the music coincide; in other cases, such as that of the opening Meyer, the templates conflict with one another. In the case of the repeated then retrograded High- $\hat{2}$  complex, the idiomatic deviation can be understood through either lens: the deviation from an idiomatic commonplace might be obvious to listeners experienced in the style; the play upon "adjacent"

<sup>42</sup> Elizabeth Hellmuth Margulis, *On Repeat: How Music Plays the Mind* (New York: Oxford University Press, 2014), 42–43. The article cited within this extended quote is Elizabeth Hellmuth Margulis, "Musical Repetition Detection across Multiple Exposures," *Music Perception* 29/4 (2012): 377–385.

<sup>43</sup> Margulis, "Musical Repetition Detection," 384.

<sup>44</sup> Regarding the musical background and listening habits of Margulis's participants, see "Musical Repetition Detection," 380. While 15 of 29 participants reported listening regularly to classical music and 5 participants had some music theory training, it seems to me quite safe to assume—given the surprising paucity of performances of mid-eighteenth-century music even in present-day "classical" concert halls—that the participants are *not* thoroughly acquainted with the galant idiom, as experienced as they might be with tonal musics and genres. Regarding the low number of performances of eighteenth-century music, see, for instance, the ranking of orchestral performances cited in Justin London, "Building a Representative Corpus of Classical Music," *Music Perception* 31/1 (2013): 85 Appendix 6. While Mozart is the top-ranked composer in terms of the number of performances and Haydn is the tenth ranked composer, the bulk of the performances are of pieces written in the nineteenth century or later.

solmization syllables (*mi-fa-sol*) for an unidiomatic upward leap would only have been intelligible to someone with an explicit knowledge of hexachordal solmization. Whatever the case, Haydn's minuet allows us to trace the interactions of schemata, hexachords, and the retrograde compositional conceit.

#### 4. *Second Case Study: String Quartet Op. 50, no. 6, First Movement*

From a listener's perspective, the opening of Haydn's string quartet Op. 50, no. 6 (see Example 9a) plays upon finding the initial tonal center and meter. Taking a dynamic listening perspective, Danuta Mirka observes that "the process of establishing the [perceived] syntactical matrix of meter and key is delayed in both dimensions, and the arrival of this process marks the structural beginning of the sonata form [in m. 4]."<sup>45</sup> Haydn's opening *in medias res* reflects not only the listener's search for meter and tonic, but also the first violin's hesitant search for a solmization syllable through orientation to tonal implications: only when the key-defining dominant 6/5 chord enters on the downbeat of m. 2 can the imaginary solfeggist (embodied by the first violin) orient themselves definitively to the right solmization syllables.<sup>46</sup> In retrospect, it turns out that mm. 1–2 contain a High- $\hat{2}$  melodic complex, such that the first violin started on *sol* from the "wrong," *Inganno* hexachord. Thus, m. 2 represents the establishment of the main skeletal thread of schema core tones. In addition to the play on scale-degree identities, the rhythm of the opening High- $\hat{2}$  is highly unusual, perhaps representing some hesitation on the part of the solfeggio singer (first violin). In contrast, the first violin's cadential melodic formula in mm. 3–4 is conventional through and through.<sup>47</sup>

The movement as a whole is a good case study for hexachordal tricks in Haydn, since his usage of slurs seems to indicate solmization melismas. In Baragwanath's terms, *traits* in solfeggio sources are somewhat flat, slur-like symbols that signify uniting several notes under a single solmization syllable, rather than solmizing each note independently on its own implied syllable.<sup>48</sup> In analyzing this movement, I will read slurs as traits in order to appreciate Haydn's solmization play. I will rely on

<sup>45</sup> Danuta Mirka, *Metric Manipulations in Haydn and Mozart: Chamber Music for Strings, 1787–1791* (New York: Oxford University Press, 2009), 34.

<sup>46</sup> I am influenced here by Edward Klorman's discussion of the multiple agency of instruments in chamber music in his *Mozart's Music of Friends: Social Interplay in the Chamber Works* (Cambridge: Cambridge University Press, 2016). In my present analysis, an imaginary solfeggio singer has to fit the changing musical surface into solmization syllables.

<sup>47</sup> See the discussion of this cadential pattern in Mirka, *Hypermetric Manipulations*, 242–243.

<sup>48</sup> See Baragwanath, *The Solfeggio Tradition*, 135.

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James Webster's edition of this movement in the *Joseph Haydn Werke*.<sup>49</sup> Whenever there is a slur in Webster's edition—with or without editorial brackets—I used it in subsequent examples from the movement and assumed that it represents a melisma, whether the syllable reflects the first note (Baragwanath's Amen rule) or the goal note (his appoggiatura rule). This allows me to test my claim that the movement in fact represents solmization play through an authoritative edition. Since skeletal solmization syllables tend to be "stepwise," it is in practice generally easy to decipher which syllable should be given precedence—the one corresponding to the first or last note. At certain spots in Example 10—m. 8, mm. 23–25, and the first beats of m. 30 and m. 31—I had to unite rapid embellishments under a single syllable even without the presence of a slur; in mm. 19–21, I had to assume that this segment of the Prinner schema represents *la-sol-fa* despite some "missing" or "superfluous" slurs when they are read as traits.<sup>50</sup> Nevertheless, it seems remarkable that the rest of the excerpts from this movement that are analyzed here have a direct correspondence between slurs and solmization syllables, creating mostly stepwise solmization patterns as is typical in this practical tradition: this strongly supports my claim that the movement is in fact a solmization game. The hidden solfeggio singer that I will track in the quartet is generally the first violin, but when the principal melodic thread moves to a different instrument, the syllables are taken over by that instrument; in addition, imitative passages involve solmization canons.<sup>51</sup>

Let us compare the opening (Example 9a) to its altered repetition at the beginning of the development (Example 9b). Though the opening of Example 9a is initially ambiguous, what turns out to be a High- $\hat{2}$  complex implies that E5 is *sol*; the following four sixteenth notes united by a slur can be lumped under *fa* (=D5), while G4 in the next measure also fits as *fa* of a lower hexachord. Since the melody ultimately continues to descend below the tonic note, D4, F#4 surely has to be solmized *la* in order to make room for the subsequent descent. Note that every change of syllable is associated either with the end of a slur or with a change of pitch without a slur. In one case, across the barline between m. 1 and m. 2, the slurred group of notes is followed by a G corresponding to the same syllable *fa*, hence a change of syllable is not necessary. When the opening four measures are reinterpreted in the

<sup>49</sup> See the edition of the first movement in James Webster, ed., *Joseph Haydn Werke XII, 4: Streichquartette "Opus 42," Opus 50" und "Opus 54/55"* (München: G. Henle Verlag, 2009), 93–99.

<sup>50</sup> For a discussion of the Prinner schema, the *la-sol-fa-mi* solmization pattern, and related issues, see Baragwanath, *The Solfeggio Tradition*, chap. 8.

<sup>51</sup> Regarding bass lines conceptualized as syllables or as scale degrees, see Baragwanath, *The Solfeggio Tradition*, chap. 13. My current focus is on play involving mainly the principal melodic thread, even though solfeggio bass lines could also be conceptualized in the period in terms of solmization syllables.

key of vi (B minor) at the beginning of the development (Example 9b), Haydn maintains all solmization syllables but one: *sol-fa-la-sol-fa-mi-fa* in the opening of the exposition turn into *sol-fa-la-sol-fa-mi-re* in the development. Of course, the deceptive cadence and surprising shift to G major in m. 58 suggest that B3 may now become *mi*, perhaps retaining the syllable of the preceding C#4.

Example 9a. Haydn, String Quartet in D major Op. 50, no. 6, first movement, mm. 1–4.

Example 9b. Haydn, Op. 50, no. 6, first movement, mm. 55–58 (opening of the development section).

Despite the almost exact repetition of syllables, each of the two passages contain sufficient tonal information to suggest D major and B minor respectively: the second measure of the piece, m. 2, and the second measure of the development, m. 56, contain dominant-tonic relations revealing the local center. When the novel and surprising reharmonization of m. 56 enters, the imaginary solfeggio singer now realizes that G4 becomes *fa*-above-*la* respective to B minor, such that F#4–E4–D4–C#4–B3 fit as *la–sol–fa–mi–re* within one hexachord (compare to Example 2 above). In other words, the first violin might be surprised by the new harmonic context provided by the rest of the quartet in this interactive music making. Yet, elegantly, the old syllables now work equally well in B minor. The hesitation, surprises, and lack of conventional synchronization between the first violin and the rest of the quartet in these two passages may perhaps be a reminiscence of Haydn's work as an accompanist for Porpora, representing some possible glitches in the interaction between the solfeggist and the accompanist.<sup>52</sup>

One might argue that the connection between the opening of the exposition and that of the development are trivial, having to do with a basic property of hexachordal solmization: in both Example 9a and 9b, the play involves hexachords starting on A4, D4, and A3, and the solmization is determined by the terrain of these hexachords, whether the local tonic note is *fa/do* (in D major) or *re* (in B minor). Nevertheless, the search for a tonal context and the implied search for a solmization syllable—along with the slurs that can be read as solmization traits for melismas—support the notion that this in fact represents solfeggio play. This is further emphasized in mm. 52–54 (not shown), just before the first double bar, in which the violin makes several attempts to climb through skeletal A4–B4–C#5–D5 or *do–re–mi–fa* before reconnecting to E5 *sol* in the exposition repeat (or in the beginning of the development). Thus, the first violin emphasizes scalar, didactical ascent through the hexachord starting on A4, before reconnecting to E5 that changes its identity to a High  $\hat{2}$  or *Inganno* respective to the main, lower melodic thread.

As in the retrograde minuet, the esoteric solmization play is also accompanied by playfulness that a listener well-versed in the idiom might be able to appreciate. In terms of scale-degree identities (or *qualia*), a similar motive is reinterpreted in a new key.<sup>53</sup> In fact, for listeners or musicians playing

<sup>52</sup> Regarding Haydn work as Porpora's accompanist, see Diergarten, "True Fundamentals," 56–57.

<sup>53</sup> For entry points into the issue of scale-degree *qualia*, see the introductory discussion in Steven Rings, *Tonality and Transformation* (New York: Oxford University Press, 2011), 41–43; as well as the extensive discussion in David Huron,

together, the movement still offers a delightful interplay of the “dotted-half + 4 descending sixteenth notes” motive, which appears in different scale-degree guises throughout. Of course, galant schemata are skeletal scale-degree patterns respective to a local tonic, but they emerge across a style, reflecting interopus relations; Haydn’s chameleon motive, which changes its scale-degree contexts, creates an intraopus connection within this quartet. In any case, Haydn engages various types of listeners, not only those initiated in the mysteries of solfeggio.

The image shows a musical score for the first movement of Haydn's String Quartet in B minor, Op. 64, no. 2, measures 1-4. The score is in 2/4 time and B minor. The first staff is the vocal line with lyrics: "Do mi fa mi la sol fa la sol fa do re mi do". The other three staves are for string instruments. Dynamics include piano (p) and forte (f). The first violin part in mm. 1-2 outlines an ascending hexachord. The other instruments enter in mm. 3-4, shifting the frame of reference to minor.

Example 9c. Haydn, String Quartet in B minor, Op. 64, no. 2, first movement, mm. 1–4

Example 9c presents another ambiguous quartet opening by Haydn, including the well-known tonal competition between D major and B minor.<sup>54</sup> From my present angle, the first violin part in mm. 1–2 outlines an ascending hexachord. Had Haydn stayed in D major and descended back to D<sub>5</sub>, the opening pattern in mm. 1–3 would have been an ascending and descending hexachord, and there would not have been a need for a mutation: the solmization would fit in one hexachord, based on *do–(re)–mi–fa–(sol)–la–sol–fa–mi–re–do*, landing back on D<sub>5</sub>. Instead, the entrance of the other instruments shifts our frame of reference to minor: the mutation downwards—which by itself could

*Sweet Anticipation: Music and the Psychology of Expectation* (Cambridge, MA: MIT Press, 2006), chap. 9. See also Benjamin Hansberry, “What are Scale-Degree Qualia?” *Music Theory Spectrum* 39/2 (2017): 182–199.

<sup>54</sup> See the detailed analysis of metric, tonal, and topical factors in Mirka, *Metric Manipulations*, 83–85.



have led to D<sub>5</sub> as tonic *fa* of D major—turns out to be a downward spiral oriented towards B minor. Much like the opening gesture fits within a hexachord, the minor mode descent reaches down exactly to (sharpened) *do* or A<sup>#</sup>4, stretching to the very bottom of the hexachord and creating a degree of solmization symmetry despite the tonal shift: *Do* is now not the stable tonic of D major as initially expected but rather the leading tone of B minor, yet the solmization is a near-palindrome.

I will now turn to a more continuous account of mm. 1–38 of Op. 50, no. 6, first movement, which are given in the lengthy Example 10. After Haydn's disorienting opening, the solmization patterns in mm. 5–6, 7–8, and 9–10 are *mi–sol–fa–mi*, *re–la–sol–fa–mi*, and *la–sol–fa–mi*, respectively. One might think of mm. 5–6 and mm. 7–8 as a gradual unveiling of a Prinner schema (featuring a soprano skeleton of  $\hat{6}-\hat{5}-\hat{4}-\hat{3}$  or *la–sol–fa–mi*), which often serves as a *riposte* or answer to an opening gambit. It almost seems as if the imaginary solfeggist is looking for the right pattern of *la–sol–fa–mi* or Prinner before finding it in mm. 9–10. While mm. 7–8 contain *la–sol–fa–mi*, the *la* or  $\hat{6}$  is dissonant in context and is not matched with a IV chord, that is, the typical opening sonority of the Prinner schema. In fact, in descending in the major mode, almost everything would have been solmized *la–sol–fa–(mi)*. Baragwanath writes:

As a general rule, syllables were determined by the need to avoid running out of them. Singers would look ahead to ensure that they did not find themselves stranded on an outlying *do* or *la* with nowhere to go. These boundary syllables were used sparingly, unless the melody was obviously circumscribed by a hexachord. In descending motion, the subset *la–sol–fa* was favored over *mi–re–do* because it allowed the melody to continue downward.<sup>55</sup>

Haydn explores various contexts for descent through the subset *la–sol–fa* and its continuation with *mi*: the solmization patterns implied through slurs provide many variations on this solmization theme. Indeed, solfeggio exercises often explore changing contexts for a repeated solmization pattern.<sup>56</sup> In addition, realizations of *la–sol–fa–mi* are very common in eighteenth-century music in general.<sup>57</sup> Here Haydn demonstrates a wealth of playful possibilities through the notational device of treating slurs as if they are solmization traits, creating solmization rhymes and partial rhymes.

<sup>55</sup> *The Solfeggio Tradition*, 121.

<sup>56</sup> See, for example, the comments about repeated patterns in Baragwanath, *The Solfeggio Tradition*, 183 and 202.

<sup>57</sup> Baragwanath, *The Solfeggio Tradition*, 198.

## Rabinovitch, Gilad. "Haydn's Schemata and Hexachords: Two Analytical Case Studies."

*HAYDN: Online Journal of the Haydn Society of North America* 12 (2022), <https://remix.berklee.edu/haydn-journal>

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Violin I (High-2) *fz* Sol fa *fz* la sol fa mi

Violin II *fz*

Viola *fz*

Cello *fz*

(Comma) 4 3 2 1 7

Complete Cadence

Detailed description: This musical score shows the first four staves of an orchestral passage. The top staff is Violin I, with a '(High-2)' marking above the first measure. It begins with a forte (*fz*) dynamic and a dotted quarter note 'Sol' (G4). This is followed by an eighth-note triplet 'fa' (F4), then a dotted quarter note 'la' (A4), and finally a half-note 'sol' (G4) tied to a half-note 'fa' (F4) and a quarter-note 'mi' (E4). The other staves (Violin II, Viola, and Cello) have rests in the first measure. In the second measure, all three lower staves enter with a dotted quarter note 'fa' (F3) and a half-note 'mi' (E3), marked with *fz*. The 'Complete Cadence' section (measures 3-4) shows the lower strings holding their notes while the Violin I part continues with its melodic line.

(Comma) 5 5 4 3

4 1 mi sol (sol) fa mi

fa

Detailed description: This musical score shows the continuation of the passage. The top staff is Violin I, starting with a quarter note 'fa' (F4) in measure 4. In measure 5, it plays a dotted quarter note 'mi' (E4) and a quarter note 'sol' (G4). In measure 6, it plays a dotted quarter note '(sol)' (G4) and a quarter note 'fa' (F4). In measure 7, it plays a dotted quarter note 'mi' (E4). The lower staves (Violin II, Viola, and Cello) provide harmonic support with chords and a rhythmic pattern of eighth notes in the bass line.

Example 10. Haydn, Op. 50, no. 6, first movement, mm. 1–38 (continued overleaf).



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Complete  
Cadence

2 3 2

sol la fa \_\_\_\_\_ sol la fa \_\_\_\_\_ sol \_\_\_\_\_ (sol?) \_\_\_\_\_

(High 2)

fa \_\_\_\_\_ mi \_\_\_\_\_ Sol \_\_\_\_\_ fa \_\_\_\_\_ mi \_\_\_\_\_

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## Prinner (modulating)

19

6 5 4

la sol fa

22

3 2 1 7=3 4 3 4

Converging Cadence (Comma) (Comma)

la sol fa mi fa mi fa

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3

25

mi Sol mi do

*fz* *fz*

(Comma)

5 4

28

Sol mi do sol fa

do

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(Comma)                      (Comma)                      (Comma)                      (Comma)

3    5                      4    3                      4    3                      4    3    4    3    2

31

mi    sol    fa    la    sol    fa    (fa)    la    sol    fa    mi

Indugio

2    2 3 4 5 6                      2    2 3 4 5 6                      2    6    4    2

34

re    (re)    mi    fa    sol    la    re    (re)    mi    fa    sol    la    re    la    fa    re

Complete  
Cadence ... ??

(=Deceptive)  
1 ??

1 2  
1 *tr*

Continuing the solmization thread of this movement, in moving from m. 10 to m. 11, the cello takes over the main melodic strand from the first violin as the music shifts to the parallel minor. If we conceptualize the cello's solmization in mm. 11–14 respective to D minor, the resultant skeleton for G<sub>3</sub>–A<sub>3</sub>–B<sub>b3</sub> might be *sol–la–fa* (with a *fa*–above–*la*—refer back to Example 2). When the first violin regains the principal melodic line in m. 15, one can read the skeletal E<sub>4</sub>–F<sub>#4</sub>–E<sub>4</sub>–D<sub>4</sub> as *sol–la–sol–fa*, rhyming with the cello yet embedding *sol–la–[sol]–fa* in a radically new contour and melodic context. In this case, an imitative solmization rhyme is created respective to the cello's preceding thread. Note also that the slur connecting the span of A<sub>4</sub> to E<sub>4</sub> in m. 15 begins and ends on *sol* respective to hexachords starting on D<sub>4</sub> and A<sub>3</sub>, such that the slur connects the “wrong” *sol* to the one that lies in the first violin's main melodic thread.<sup>58</sup>

Following the brief imitation between the cello and first violin, mm. 16–19 contain a point of imitation with an imperfect solmization canon, in which different scale degrees are solmized in similar fashion: the cello's *fa–mi* (mm. 16–17) is answered by the second violin's *sol–fa–mi* (mm. 17–18) and the first violin's *sol–fa–la* (mm. 18–19). In addition to this partial rhyme, the repetition of a

<sup>58</sup> Compare this cadence to *The Solfeggio Tradition*, 122, ex. 6.28(e), which is a slightly different melodic constellation involving a similar trick with adjacent hexachords.



motive starting on different scale-degree identities or *qualia*—D3, A5, E6 (contextually  $\hat{1}$ ,  $\hat{5}$ ,  $\hat{2}$ )—offers playfulness that can be appreciated even without knowledge of hexachords. The first violin's entry continues the play upon "*la-sol-fa-mi*": now *sol-fa-la-sol-fa-la-sol-fa-mi* (mm. 18–23) are a Modulating Prinner–Converging Cadence succession of schemata, shifting to the key of V.

The first violin's entrance in m. 18 is elegant: It repeats the pitches of mm. 1–2 an octave higher; subsequently, it maintains the constant play on *la-sol-fa-mi* [= *la*] syllables under a new schematic guise. Note also that in m. 2, G4 is a skeletal *fa*, while in m. 19, G5 resolves as a dissonance to a skeletal F#5 that is to be solmized *la* as part of a *la-sol-fa-mi* or Prinner. In other words, the first violin is now confronted with a different musical terrain in which G and F# are no longer skeletal notes receiving a syllable each, as in m. 2; rather, G now resolves to F#, which motivates the shared syllable *la*. Finally, a High- $\hat{2}$  melodic complex such as that of mm. 18–19 does not typically embellish the opening *la* or  $\hat{6}$  of a Prinner schema, though it of course represents a motivic connection within this movement. Thus, solmization play is intertwined here with play upon conventional schemata and motivic play.

The turn toward A minor in mm. 26–29 brings with it another imitative play. Taking slurs as traits, I suggest reading the first violin, viola, and second violin's canon in mm. 26–29 as *sol-mi-do* respective to A minor with D, B, G# as skeletal notes each time (refer back to Example 2). The first violin's pattern in mm. 29–30 can also be solmized *sol-mi-do*. Admittedly, *sol-mi-fa* would be the proper solmization given the *mi-fa* leading-tone resolution, but if the first violin maintains the preceding syllables within this imitation point, it shifts elegantly to a higher hexachord. In this way, it can launch into a higher *sol-fa-mi* pattern in mm. 30–31, with A5 as the new *do*. In other words, if only the first violin can listen to the solmization syllables of the preceding entries, it can mutate seamlessly into a higher hexachord, if in an unorthodox way.

The violin's descent from E6 in m. 31 to skeletal B4 in m. 34, and then to a  $\hat{1}$ – $\hat{2}$ – $\hat{1}$  soprano cadential thread in mm. 37–38 represents further incessant play on *la-sol-fa-mi*. The arrival on a stopping point on skeletal B4 in m. 34 foreshadows the opening of the development (Example 9b) discussed at the outset of this section. Equipped with hexachordal solmization, the descent translates

to *sol-fa-la-sol-fa-la-sol-fa-mi-re*.<sup>59</sup> From the perspective of galant schemata, mm. 31–33 contain a succession of  $\hat{4}-\hat{3}$  resolutions or instances of the Comma schema in the first violin respective to local tonics A major, F# minor, D major, and B minor. Haydn supports each brief tonicization through tritone resolutions in the local outer voices at any given moment: this succession of four identical Commas with clear surface parallelism (and identical local tonal function) is not reflected clearly in the solmization. The musical behavior of scale degrees is identical across Commas respective to a major-mode or minor-mode local tonal center, but the equivalence between all four Commas is obscured by the syllables, which are based on hexachords starting on A5, E5, and A4. In an instance like this, there is thus tension between conceptualizing the passage based on schemata (or scale degrees respective to a local tonic) and conceptualizing it based on hexachords.

While Gjerdingen refrains from using anachronistic Roman numerals, one might think of his Indugio schema as melodic lingering surrounding a cadential  $ii^6$  chord. Haydn's  $ii^6$  chord in mm. 34–36 is elaborated melodically such that all notes fit well as *re-mi-fa-sol-la* within a single hexachord. Haydn's usage of a  $\hat{1}-\hat{2}-\hat{1}$  melodic cadential string in the soprano in mm. 37–38 facilitates remaining within a single hexachord, without a need to mutate downward toward  $\hat{1}$  solmized as *fa*. In such a way, the Indugio and (anticipated) Complete Cadence of mm. 34–38 (as well as the preceding descent in m. 33) all outline a single hexachord. In other words, the choice of a  $\hat{1}-\hat{2}-\hat{1}$  melodic string allows the first violin to stay within the confines of a single hexachord, creating a simpler solmization context than the  $\hat{1}-\hat{7}-\hat{1}$  cadential string of mm. 3–4, which required a mutation. Of course, the Deceptive Cadence actually present in mm. 37–38 implies that A4 is no longer *do* but rather turns into *mi* in its new context. Thus, the solmization of the first violin in mm. 37–38 might be understood as *do-re-mi*, an opening ascending pattern, rather than a closing one, creating further play.

Finally, commentators have observed the return of the ambiguous opening motive in the finale of this quartet (Example 11 reproduces mm. 178–185 of the finale).<sup>60</sup> For instance, Floyd Grave and Margaret Grave write: "True to the purpose of a finale in highlighting restored stability, the borrowed gesture is pointedly transformed. The opening attack is now harmonized as a chord tone of a temporarily tonicized submediant, and the descent to tonic, no longer functionally incongruous,

<sup>59</sup> G $\sharp$  as *fa* in m. 32 represents an instance of *fa-above-la*.

<sup>60</sup> As in my annotated examples from the first movement, Example 11 also relies on Webster's readings of articulation marks in *Joseph Haydn Werke XII, 4*, whether in editorial square brackets or not. The last movement is at 107–113.

serves to bring an eight-measure thematic statement to a satisfying close.”<sup>61</sup> To add to their observations from the present perspective, F#5 would be *la* respective to B minor (compare to Example 2 above); B4, the goal tone of the slur read as a trait, is *la* respective to a hexachord starting on D4. Thus, m. 182 is a kind of pivot between hexachords and tonal centers. This facilitates a D-major descent through a complete hexachord starting on D, *la-sol-fa-mi-re-do*, in mm. 182–185. Unlike the baffling original context of Example 9a, here in Example 11 the descent through a hexachord is straightforward. By changing the opening  $\hat{1}-\hat{7}-\hat{1}$  cadential string from mm. 3–4 of the first movement (Example 9a) into a  $\hat{3}-\hat{2}-\hat{1}$  string in mm. 184–185 of the fourth movement (Example 11), Haydn “restores stability”—to use Grave and Grave’s phrase—by making things easier for the hidden solfeggio singer.<sup>62</sup> The final, syncopated and striking repetition of the recurring motive, in the finale’s mm. 229–231 (not shown), leads to a cadential 6/4 chord for a cadence that does not materialize.<sup>63</sup> In a sense, the motive is left unresolved; yet by neatly articulating a descending hexachord from B to D, Haydn makes explicit the hexachordal play of this motive, which is now finally straightforward. Thus, solmization games can contribute to our analytical engagement of the quartet’s multi-faceted manipulations.’

This tour through excerpts of Haydn’s piece has shown some interactions of solmization games with the general communicative game of the piece. While musicians trained in hexachordal solmization might appreciate play on skeletal syllables and traits, other types of listeners—be they connoisseurs or amateurs—may appreciate unusual renderings of the High- $\hat{2}$  complex or the repetitions of a rhythmic motive in various scale-degree guises, that is, play upon conventional (interopus) schemata as well as play upon a motive particular to this piece (an intra-opus relation).

<sup>61</sup> Floyd Grave and Margaret Grave, *The String Quartets of Joseph Haydn* (New York: Oxford University Press, 2006), 237. Compare also to the discussions in Mirka, *Hypermetric Manipulations*, 250–252; and W. Dean Sutcliffe, *Haydn: String Quartets, Op. 50* (Cambridge: Cambridge University Press, 1992), 101–103.

<sup>62</sup> Mirka, *Hypermetric Manipulations*, 250–252 comments inter alia on a fantasia-like passage in strict counterpoint in this movement in mm. 63–70 (not shown here) with a return to the galant style in m. 71. Note that the first violin’s galant cadential melody in mm. 71–74 is ironically confined to an antiquated hexachord on A4. The home-key return of the finale’s m. 71 is in its m. 200.

<sup>63</sup> See Mirka, *Metric Manipulations*, 179 and 180, example 5.11(b)

182

la la do la la do la

la sol fa mi re mi re do

*fz*

*fz*

*fz*

Example 11. Haydn's Op. 50, no. 6, fourth movement, mm. 178–185

## 5. Conclusion

In a highly speculative territory such as that of reconstructing eighteenth-century solmization, Op. 50, no. 6, with its revealing slurs, seems to me to provide strong evidence for hexachordal solmization as a meaningful mental model for Haydn—as much as musical scores can serve to complement Baragwanath's impressive philological reconstruction of this tradition. More broadly, the two analytical case studies from Haydn demonstrate some of the many ways in which hexachordal solmization—an esoteric conceptual system—may have interacted with commonplace schemata in eighteenth-century compositions. Considering this intersection allows us to appreciate different facets

of Haydn's playfulness, revisiting a conventional trope in writings about the composer from a new angle. As twenty-first-century scholars and listeners, this can allow us to reflect on his communicative games, as speculative as any attempt at historical reconstruction must remain.

The analysis using schemata and hexachords shows both areas of overlap as well as non-overlap: in some cases, the soprano skeletons of galant schemata simply fall out of skeletal solmization syllables, as Baragwanath's *The Solfeggio Tradition* clearly demonstrates; in other cases, there is a mismatch between the templates. Indeed, if the equivalence between major-mode and minor-mode Commas is not clear from their hexachordal representations in a context such as that of Op. 50, no. 6, hexachords might be detached from the equivalent usage of galant schemata in major- and minor-mode local contexts. To give another example, Baragwanath stresses that the Fonte schema encapsulates the hexachordal "source" of all harmony, *do-mi-sol* (=major) and *re-fa-la* (=minor): its  $\hat{5}-\hat{4} \dots \hat{4}-\hat{3}$  skeleton would have been solmized *sol-fa...fa-mi*.<sup>64</sup> Yet this solmization pattern obscures the obvious parallelism between dominant-tonic (or tritone) resolutions of the Fonte schema respective to two local tonal centers (ii and I), which is typically accompanied by melodic parallelism on the musical surface: Gjerdingen's annotation of this schema as  $\hat{4}-\hat{3} \dots \hat{4}-\hat{3}$  represents the equivalent functions of scale degrees respective to a local tonic.<sup>65</sup> More generally, soprano scale-degree identities respective to a local tonic—reflected in the system of galant schemata—capture a central aspect of eighteenth-century usage that is not always transparent in hexachordal solmization, highlighting tensions between the systems.<sup>66</sup>

While this article is intended as an analytical exploration, the intersection of schemata and hexachords ties into my previous work on galant schemata. In a series of articles written without access to Baragwanath's reconstruction, I had argued that the skeletal soprano tones of galant schemata can be found underneath the ornate surface based on a limited number of heuristic principles: preference for outer-voice tritone resolutions, removal of accented dissonances, and melodic fluency (or skeletal stepwise motion).<sup>67</sup> Since the interval respective to the bass determines

<sup>64</sup> Baragwanath, *The Solfeggio Tradition*, 201.

<sup>65</sup> See the graphic representation in *Galant Style*, 456.

<sup>66</sup> Compare also to Baragwanath's observations in *The Solfeggio Tradition*, 290, regarding the need to identify scale degrees in the bass in thoroughbass and partimento realizations.

<sup>67</sup> See "Reexamined," "Hidden Polyphony," and "Implicit Counterpoint in Gjerdingen's Schemata," *Music Theory & Analysis* 6/1 (2019): 1–49, as well as the collaborative computational implementation in Carter-Ényì and Rabinovitch, "Onset and Contiguity."

the identity of outer-voice tritones and accented dissonances, one might almost think about the bass as a kind of foil against which the soprano skeleton of galant schemata is found.<sup>68</sup>

As an analyst, I had sought to move from surface to skeleton based on a limited number of principles; as it turns out, my discovery procedure runs closely to several principles inherent in the solfeggio tradition, in which *fa–mi* semitones, accented dissonances (subsumed under a skeletal syllable), and stepwise motion among skeletal syllables (if not always among skeletal notes) are central. The work of the analyst extracting core tones runs opposite to that of the solfeggio singer who learns how to embellish a scaffolding.<sup>69</sup> In future work, I would like to explore more fully how Baragwanath's reconstruction of a historical art of diminutions can be reverse engineered for music analysis in the present day. In this way, theorizing can derive more information from a basic aspect of eighteenth-century musical training. Indeed, as Baragwanath argues, knowing which tones are skeletal and which are ornamental amounts to a historically informed approach to analytical reduction.<sup>70</sup>

Nevertheless, discrepancies remain between historical ways of conceptualizing solmization syllables and usage patterns on the musical surface. To give a foretaste of them, let us compare Example 12a to Example 12b. Baragwanath claims that a context like that of Example 12a is equivalent to an *Inganno sol–fa–mi–fa* cadence given the traits (represented here as slurs).<sup>71</sup> By *sol–fa–mi–fa*, we can imagine either a skeletal  $\hat{5}-\hat{4}-\hat{7}-\hat{1}$  pattern, as in Example 12a, but—more importantly—also the more basic and stepwise *sol–fa–mi–fa* melodic cadential string,  $\hat{2}-\hat{1}-\hat{7}-\hat{1}$ , on which this *Inganno* pattern plays. Baragwanath differentiates this context from that of flourishes akin to Example 12b, which are an embellished *fa–mi* Comma schema, noting that “to a solfeggio singer, such minute details must have been essential to the meaning of a phrase as accents in spoken language,” while we might not notice them.<sup>72</sup> I have no intention to deny that a context like Example 12a is more conclusive than one like Example 12b. Moreover, the subtle differences in how these

<sup>68</sup> Compare, for instance, to Baragwanath's observation in *The Solfeggio Tradition*, 171: “In eighteenth-century solfeggio, the bass functioned as a subordinate counterpoint to a melody made up of fundamental syllable notes,” in contrast with functional harmonic theory.

<sup>69</sup> Nevertheless, my proposed heuristics might also be useful for orienting oneself to the skeletal syllables of a highly embellished solfeggio exercise.

<sup>70</sup> *The Solfeggio Tradition*, 132. In “Hidden Polyphony,” 122–128, I explained my motivation to find a historically-informed analysis for a rabbit-duck linear dilemma in the aria “Dies Bildnis ist bezaubernd schön” from Mozart's *The Magic Flute*: that article reverse engineers diminution patterns by Quantz and others in service of skeleton finding.

<sup>71</sup> *The Solfeggio Tradition*, 171–172, see also 122, example 6.28(c).

<sup>72</sup> *The Solfeggio Tradition*, 174.

patterns were conceptualized through solmization are illuminating: this is a most impressive X-ray into the eighteenth-century musical mind, so to speak. Yet in terms of the embedding of patterns on the musical surface, a  $\hat{4}-\hat{3}$  kernel is embedded in both cases on consecutive downbeats (or displaced from a downbeat by an accented dissonance), in analogous fashion to the tendency for regularity in deployment of schema core tones in the family of galant schemata.<sup>73</sup> I have therefore represented in Example 12a both the  $\hat{5}-\hat{4}-\hat{7}-\hat{1}$  as well as the  $\hat{4}-\hat{3}$  with some question marks. Indeed, contexts like either Example 12a or 12b might be clearer for listeners as instances of skeletal  $\hat{4}-\hat{3}$  than an incongruous High- $\hat{2}$  melodic complex, in which the peripheral High- $\hat{2}$  is often on a stronger metric position than the tritone-resolution kernel. It seems likely to me that insiders, be they musicians or knowledgeable listeners, would have been attuned to such analogous usage patterns across the system of galant schemata, not only to subtle differences within the lexicon of schemata. Therefore, these examples seem to represent tensions between a historical conceptual model and the emergent usage patterns of the style as captured by galant schemata. This suggests that there are many further avenues for theorizing about the relation between solmization and schemata, as I intend to do in the future.



Example 12a. An embellished context for Baragwanath's false soprano cadence, *Fa/mi-fa*<sup>74</sup>



Example 12b. An embellished *fa-mi* Comma<sup>75</sup>

<sup>73</sup> Compare, again, to Symons, "Cognitively Inspired Method." See also my discussion of pitch adjacencies and nonadjacencies in "Reexamined," 74–76.

<sup>74</sup> Adapted and reannotated after *The Solfeggio Tradition*, 172, Ex. 8.4(b).

<sup>75</sup> Compare to the similar melodic framework (and different surface pattern) in *The Solfeggio Tradition*, 173, Ex. 8.5(b), mm. 1–2.

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Finally, I find the genesis of this article curious. In collecting musical examples to be analyzed in detail—Haydn's minuet *al roverso* and the opening movement of Op. 50, no. 6, as well as Mozart's "Non so più"—I had thought that I was about to write an analytical article about skeletal core tones and peripheral elements or about unusual instances of the High- $\hat{2}$  melodic complex; little had I known that this would become an article about schemata and solmization games. In fact, the subverted schematic implication in "Non so più" reflected in Examples 5a and 5b was on my mind already in 2013 since I presented it at a workshop at Cornell University that year. Reading *The Solfeggio Tradition* showed me that the examples that I had set aside actually manipulate both schemata and hexachordal solmization, which came as a surprise. Thus, the analytical examples that I had set aside finally found a claim: that they represent playfulness on both schemata and hexachordal solmization. Even if the specifics of my assigned solmization syllables in this article are debatable or incorrect—which they might well be—I hope to have made a compelling case for engaging these pieces using both tools, demonstrating some potentials for synthesis in music analysis, as well as some directions for future theorizing.

### *Abstract*

Two analytical case studies, from Haydn's minuet *al roverso* (from the Symphony Hob. I: 47) and the opening movement of the String Quartet Op. 50, no. 6, show the interaction of galant schemata (Gjerdingen 2007) and the hexachordal solmization of the solfeggio tradition (Baragwanath 2020). Haydn plays upon conventional galant schemata—presumably elements of style shared by listeners who are closely familiar with the idiom (even if they do not have explicit schema labels); he also plays upon a more esoteric element of his own training and that of many other musicians in the period: hexachordal solmization. By considering both schemata and hexachords, I argue that Haydn's conceits work on multiple levels, communicating with both stylistic insiders familiar with schemata, as well as with a narrower group of insiders trained in hexachordal solmization.



Rabinovitch, Gilad. "Haydn's Schemata and Hexachords: Two Analytical Case Studies."

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