

SOME PROBLEMS AND RESOURCES OF MUSIC THEORY

DAVID LEWIN

Many years ago I had a student at the keyboard realizing figured bass, while the rest of the class was writing down Roman numerals. At the end of one phrase, the pianist saw Figure 1a and played something like Figure 1b. The rest of the class uniformly reported hearing Figure 1c.

Figure 1.



I had the pianist repeat the realization a couple of times, but nobody else heard anything to change about Figure 1c. Finally I put Figure 1a and the soprano line of Figure 1b up on the board, much to the class's surprise. "But you shouldn't be surprised," I said. "Just a few days ago I was talking about 6-chords, including why our text says not to double the bass. If you remember, I said the idea behind the rule was to keep the bass of the 6-chord from asserting itself as a root. Then I talked about exceptions to the rule. One exception was when the root function would be idiomatic, for instance in the cadence formula ii⁶-V. And here is just that formula. That's why you all heard a IV root for the ii⁶, especially with the bass of the ii⁶ doubled in the soprano here, preceded by its own leading tone."

There was a considerable silence. Then one student raised his hand and said, "Yeah, but that was just theory."

Thirty years later I am still unable to disentangle the genius of that remark from its imbecility. Both involved the way in which the theory lecture attempted to describe a conceptually structured sound-world that was categorically prior to any particular musical event, score, or experience.

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The occasion must have influenced my prose some seven years later in 1968, when I wrote that music theory “attempts to describe the ways in which, given a certain body of literature, composers and listeners appear to have accepted sound as conceptually structured, categorically prior to any one specific piece.”¹ Today I am still reasonably satisfied with that view of music theory, and I shall explore various of its aspects in some detail.

Overworked terms create problems for us in describing conceptual sound-structures, and the pursuit of those problems can be enlightening. My book on generalized musical intervals arose in part as an attempt to pursue some of the ways in which the term “interval” has been overworked.² The overworked term “minor” was the source of another interesting exploration for me, an exploration I shall begin with another pedagogical story.

Figure 2 illustrates typical errors in the exercises that one student, about twenty years ago, was submitting for a first-year class in Jeppesen-style species counterpoint. I kept correcting his papers, indicating why the *ficta* was inappropriate, and reminding him that Jeppesen forbade the MAJOR sixth leap up, while the MINOR sixth leap up was permitted. We would talk, and he would say he understood. But exercises like Figure 2 kept coming in. Finally, at one of our agonized critiques, he said to me, “But I AM leaping up the minor sixth; that’s why I need the accidentals.” When I asked him what he meant, he pointed to something like the beginning of figure 2a and said, “You see, B-flat to G, that’s G minor.” Then, remarkably, he pointed to something like the beginning of Figure 2b and said, “You see, A to F-sharp, that’s F-sharp minor.”

Figure 2.



For purposes of the first-year course, it was sufficient to remind the student that the word “minor,” in this context, describes the acoustic size of the sixth, not its modal or harmonic character. But the incident triggered interesting thoughts for me beyond that. First of all, I noticed how apt for this context was Zarlino’s way of describing sixths.³ When a sixth is regarded as a fourth plus a third, or a third plus a fourth, the smaller sixth

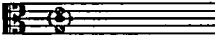
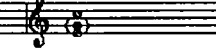
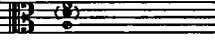
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is associated with the smaller third, and the larger sixth with the larger third. My student would not have had his problems, had he originally acquired his concepts about sixths from the historically pertinent sound-world of Zarlino, instead of from some subsequent theory that had described sixths as inversions of modally charged thirds. The point about Zarlino is especially interesting because Zarlino himself is already showing sensitivity to modal charges on thirds, both as major or minor consonances above a bass, and as major or minor third degrees in various scales.

Indeed that sensitivity seems to underlie some of the problems Zarlino has describing consonant sixths in "a conceptually structured sound-world ... categorically prior to any particular musical ... experience." For him the larger sixth is conceptually always as in Figure 3a.

This displays the large consonant sixth as composed from elements of the scenario, here 6 and 4 as divided harmonically by the mean term 5. It also displays the sixth as composed from a fourth below plus a third above. Zarlino's problem with the small consonant sixth involves an attempt to preserve both these features of his large sixth. He wants the small sixth to be composed from elements of the scenario, as in Figure 3b; there the small sixth is composed from elements of 8 and 5 of an extended scenario, divided by a "mezzano termino harmonico which is 6."⁴ From a modern point of view, we can say that he wants the small sixth of Figure 3b to stay in C major like Figure 3a, our C major here reflecting Zarlino's conceptual *Urklangwelt* of the scenario. At the same time, Zarlino wants his small sixth to be constructed by minor/major analogy with his large sixth, in a manner suggested by the analogy of Figure 3c with Figure 3a. He says that the sixths "are composed ... from the fourth plus the major third, or the minor third."⁵ But clearly Zarlino cannot both have the minor/major analogy of Figure 3c, and remain within the extended scenario as in Figure 3b. That is, he cannot so long as he wants to speak of "THE" minor sixth. Here the term "THE" is problematic, given his conceptual sound-world. Figures 3b and 3c clearly describe two distinct consonant minor sixths.

Figure 3.

a.	b.	c.
		
6:5:4 in senario; 4th and (M) 3rd	8:6:5 in (extended) senario (Bk. 1, Ch. 16)	4th and (m) 3rd (Bk. 3, Ch. 21)

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Figures 4a and 4d distinguish the sixths as a minor third plus a fourth, or a fourth plus a minor third. Zarlino could have used this terminology, had he wished to. He could also have used the terminology that distinguishes Figure 4b from Figure 4e. 4b describes one sixth as the span from third to octave in some major-3rd authentic mode, mediated by the fifth of the mode. 4e describes the other minor sixth as the span from fifth to third in some minor-3rd authentic mode, mediated by the octave of the mode. Zarlino did not, of course, have at hand the terminology that enables us to describe 4c and 4f, where the two minor sixths are distinguished as third-to-octave of a major triad, or fifth-to-third of a minor triad. There are a variety of technical reasons why it would have been awkward for Zarlino to have distinguished two minor sixths as in 4ad, or as in 4be. More important is an overriding conceptual reason: for Zarlino, each consonance must exist as one abstract universal Platonic entity, before it is allowed to enter into a variety of contexts like those of Figure 4. So in particular "THE" minor sixth must exist, if we are to treat minor sixths as consonances.

Figure 4.

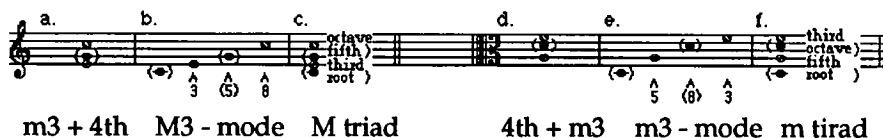
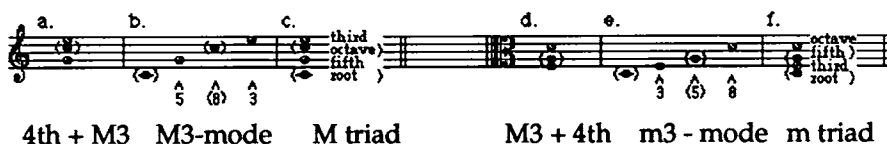


Figure 5 shows that the same critique can be applied to "THE" consonant major sixth, even though Zarlino has no technical problems with that interval. The distinction between two different major sixths is illustrated by the student's analysis of Figure 2. The student analyzed Figure 2a as "B-flat to G, that's G minor." This follows the model of Figure 5def. The student then tried to analyze Figure 2b according to the same model: "A to F-sharp, that's F-sharp minor." But this analysis is malformed in a way the other was not. Evidently the A-F-sharp leap of Figure 2b conforms to the model of Figure 5abc, not 5def. However the student was unable to say "A to F-sharp, that's 5-3 in D major." He couldn't say that precisely because he was trying to relate all the things he called minor sixths—that is, all the things we call major sixths—to minor modes and triads. Even sweeping up after the student, we still find the terms "minor" and "major" to be over-worked. And, perhaps yet more serious, the term "THE," when applied to "minor sixth" or "major sixth," is improperly restricting the pertinent conceptual sound world. To more fully explore that world you can ask yourself these questions: in what ways is Figure 5abc the analog of Figure

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4abc? And in what ways is Figure 5abc the analog of Figure 4def? Exploring those questions, you will soon hear the four consonant sixths interrelating conceptually among themselves in a very complex way.

Figure 5.



I call Figures 4 and 5 “consonant” sixths because I can imagine the analysis of (b), (c), (e), and (f) being applied, in a more modern context, to various “dissonant” sixths. A large dissonant sixth, for example, is spanned between the 4th degree and the 2nd degree of a major or minor scale. This sixth extends within a dominant seventh harmony, from the seventh of the harmony up to the fifth; it articulates naturally into an augmented fourth below plus a small third above. One hears the sixth when Tamino sings “wie noch kein Auge je gesehen,” following the motive of “Dies Bildnis ist bezaubernd schoen.” Other dissonant sixths, small and large, extend within dominant ninth harmonies, from the major or minor ninth of the harmony up to the seventh. Such a sixth is spanned from the 6th degree of its scale to the 4th degree, as divided by the 2nd degree.

I pointed out earlier that “for Zarlino, each consonance must exist as one abstract . . . Platonic entity, before it is allowed to enter into a variety of contexts like those of Figure 4.” That involves what I shall call “the Platonic THE” of Zarlino’s locution, “THE minor sixth.” The world of music theory is full of such Platonic THEs, improperly constraining the discourse.

Figure 6 shows how a Platonic THE confuses Rameau’s discussion of “THE minor third” in the *Traité* (Book I, Chapter 3, Article 5). According to Rameau’s earlier discussions, the E-G dyad of Figure 6a should either be assigned a C root, or else no root at all. The same is true for the E-G dyad as it appears in Figure 6b. There is no reason to assign this E-G dyad the root E. On the other hand, we can intuit good common-sense reasons for assigning the C-E^b dyad of Figure 6c the root C. By confounding the two different theoretical dyads under one Platonic rubric, Rameau believes he is able to assert of something called “THE minor 3rd,” both that it is directly generated, like the E-G of figures 6ab, and that it has its lower note as a root, like the C-E^b of figure 6c.

Figure 6.

a. the directly generated [5:6]
J-PR: "THE m3" [three *what?*] is generated directly.

b. [J-PR: "THE" m3]
the directly = (the d.g.) and (the d.g.)
generated [4:5] [5:6]
[2:3]

c. the directly = (*some* [5:6]) and (*some* [4:5])
generated [J-PR: "THE" m3]
[2:3]

J-PR says that 6c may be derived from 6b, by intervallic "inversion," since both [4:5] and [5:6] are "thirds." [Three *what?* See Lewin, *GMIT*, Appendix A, esp. 246-247.]

Aristoxenus, who was born about the time of Plato's death, is already sensitive to the Platonic THE in music theory. He writes: "... the same notation is employed for the tetrachords hyperbolaion, neton, meson, and hypaton. Thus the signs fail to distinguish the functional differences, and consequently indicate the magnitudes of the intervals, and nothing more. But ... mere knowledge of magnitudes does not enlighten one as to the functions of the tetrachords, or of the notes, or the differences of the genera, ... or indeed anything else of the kind."⁶ Aristoxenus's specific critique is relevant to present-day discussions of "THE fourth," when we attempt to use that Platonic rubric to cover both the dyad G-C and the dyad C-F in the context of C tonicity.

Fétis may well have been sensitive to Aristoxenus's general critique, when, in the *Traité*, he presented his theory of 19th-century European tonality.⁷ Intervallic magnitudes, he asserts, do have specific fixed Platonic attributes. But so do the degrees of a given scale or mode. Composing in a key involves matching the Platonic characters of the vertical intervals above the bass, with the Platonic characters of the scale-degrees in the bass. A mismatch gives rise to modulation. Thus, to illustrate "THE perfect fourth" as a "natural interval," free from any tonal context, Fétis displays the dyad C-F.⁸ However, when "THE perfect fourth" is to be displayed as *consonant in the C major system*, Fétis represents it by the dyad G-C.⁹ In tonal music, the character of Fétis's Platonic fourth matches the character of his Platonic fifth degree in the bass, not his tonic degree. The Platonic charac-

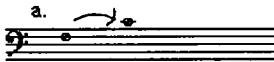
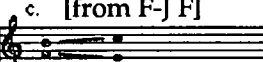
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ters that Fétis assigns his intervals and scale degrees seem to be his readings of cultural conventions.

I forgo discussing a host of technical and ideological problems with Fétis's system. The theory does respond to the problem that worried Aristoxenus; it provides a context in which vertical intervals of the same acoustic size can have a variety of functional meanings, depending on the scale-degrees over which they appear. But Fétis, when he assigns Platonic THEs to scale-degrees, still falls victim to the more general problem of Platonic rubrics.

Figures 7a,b, and c show that there are at least three different paradigmatic 4th degrees in C major, even restricting our attention to the bass. The descriptions that underlie the figures are mine. I see no reason why the 4th degree of Figure 7b can not be raised as well as pure. Fétis runs into conceptual difficulty when he tries to identify all three figures with one paradigmatic Platonic object, "THE 4th degree." The commentary under Figure 7 gives some sense of his troubles.

Figure 7.

a.	b.	c. [from F-J F]
		
"THE 4th deg." that lies a dominant interval below the tonic note in the bass.	"THE 4th deg." that prepares a cadential dominant in the bass.	"THE 4th deg." that neighbors scale degree 3.

FJF talks about *one* object called "THE 4th degree," that has *one* "character." This *caractère* "does not exclude the idea of momentary repose." [p. 15; FJF is hearing 7a, I think.] "But it may happen that the repose may not occur . . . so that the 3rd, the 5th, the 6th, and the octave can equally well accompany [i.e., sound above] this note." [pp. 15-16; FJF is hearing 7b, I think.] The augmented 4th, which is a consonance for FJF, may also accompany "THE 4th degree." FJF gives 7c as an example (p. 16). THE character of THE 4th degree is now getting pretty hard to grasp. The augmented fourth of 7c must obey its "appellative" character by continuing as shown, to the event it summons. Is the E of 7c then momentarily reposeful? No, for "THE tonal character of THE third degree [in the bass] is absolutely opposed to any sentiment of repose." [p. 20; as in 7c??] And so forth.

The citations are from Francois-Joseph Fétis, *Traité de l'harmonie*, 12th ed. (Paris: Braudus et Cie, 1879).

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In my article on phenomenology and music theory, I went so far as to challenge the Platonic THE in expressions like "THE B-flat in measure 12." I also challenged the word "IS" in statements like "THE harmony of measure 15 IS such-and-such."¹⁰ The issue in greatest generality might be termed "Hidden prior restraints in common linguistic conventions."

Let me turn now to the subject of music theory as a source for analytic metaphors. When we describe the ways in which musical sound seems conceptually structured, categorically prior to any one specific piece, we nevertheless intend our conceptual sound-worlds to be rich in potential metaphors for analyzing specific pieces. At least most of us do. Marion Guck and others have been drawing our attention for some time now to metaphorical discourse for music analysis.¹¹ But I think it is not generally appreciated how deeply and necessarily metaphorical a music theory becomes, when it is used as the basis for an analysis. The accent is on "necessarily." It is not a question of our intending metaphorical discourse or not, when we bring a theory to an analysis. We cannot help it. A spectacular example, to my mind, is afforded by the opening of Milton Babbitt's *Philomel*.

Figure 8a is an annotated short score and Figure 8b provides a row-matrix, both courtesy of Richard Swift.¹² The tape voice, which returns again and again to the pitch class E, sings vocalese on the vowel eeeeeee. Looking at measure 1 of Figure 8a, we see that the voice sings only the first note of row P0; the accompaniment provides the other eleven notes. In measure 2, the voice sings F-E, the first two notes of row P1; the accompaniment provides the other ten notes of P1. In measure 3 the voice sings E^b-D-E, the first 3 notes of row P11; the accompaniment provides the other nine notes of row P11. And so forth.

Figure 8b provides a theoretical construct that underlies the compositional procedure. The voice sings the first entry on the matrix, and the accompaniment finishes off the first row of the matrix. Then the voice sings the first two notes of the second matrix row, and the accompaniment finishes off the second row. Then the voice sings the first three notes of the third matrix row, and accompaniment finishes off the third row. And so forth.

Figure 8b suggests a metaphor: the pitch-class structure of the piece is a loom, and the tape voice enters this structure in the act of beginning to weave a tapestry. The metaphor is suggestive and powerful, because weaving a tapestry is a paradigmatic act for the mythic Philomel.

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In Ovid's story (*Metamorphoses*, Book VI), Philomel was raped by Tereus, the husband of her sister Procne. Tereus then cut out Philomel's tongue. But Philomel wove a tapestry depicting the outrage, and sent the tapestry to Procne. Procne understood the tapestry, killed the son she had borne to Tereus, and served the flesh to Tereus in a pie. The sisters fled through the woods of Thrace, pursued by Tereus. All three were magically transformed into various birds.

John Hollander's text for Babbitt's piece depicts only Philomel's transformation: the mute woman, rushing through the woods, becomes a night-ingale. But Hollander writes that he had earlier had a particular interest in the weaving scenes for a possible opera. The tapestry was to be replaced by a wild expressionist painting, but the literary idea was the same.¹³

Hollander's special interest in the weaving scenes echoes the view of Karl Philip Moritz, an 18th-century art historian and aesthetician. Figure 9 cites relevant material from Moritz; I shall put a few excerpts from my translation into the main text here.

As Moritz says of the tapestry, "the severed tongue spoke through the eloquent web. . . . nothing lay *closer* to the misfortune of the weeping innocent, nothing was so intimately connected with it, as just this laborious work of her hands. In that medium alone could she portray her being, and make known her sufferings." Just so, I claim, is Babbitt's Philomel speaking through the web of the serial matrix, through those painstakingly interwoven threads. Nothing lies *closer* to her than the laborious work of composing her piece, through Babbitt as a medium. In that manner alone can she portray her being, and make known her sufferings. To sing Babbitt's piece is to weave her tapestry.

Figure 10 cites Moritz again, talking later on about the narrative power of visual art. The entire citation applies as well, I think, to Babbitt's serial loom.

The metaphor works both ways, emphasizing that Philomel's loom is a metaphorical matrix. An English dictionary entry, under "matrix," begins: "That which contains and gives shape or form to anything, *Anat.* the womb."¹⁴ In literary classical Latin the word "matrix" means "mother" in the figurative sense, as a source or generator, as opposed to the literal sense used of the human female parent; however the anatomical sense of the word was increasing in medical and in vulgar usage, and was clearly in place by the time of the later Empire.¹⁵ Philomel's loom, as matrix, gives birth to her tapestry, the fruit of her horrible union with Tereus. Procne, reading and understanding the tapestry, denies her human parenthood, murdering her own biological son. The metaphor of Babbitt's matrix thus brings us into the heart of a sexual relationship between the two sisters.

Figure 8.

a. P_0 P_1 P_{11}

Tape Voice

Tape

P_0 P_1 P_{11}

P_3 P_3

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The musical score consists of five staves. The top staff is in treble clef, and the others are in bass clef. The score includes various musical notations such as notes, rests, and dynamic markings like 'p' and 'p6'. There are also some unusual markings like '8', '15va', and '11=...'.

b.

		I											
TAPE	P	0	11	1	9	4	6	3	2	7	8	5	10
	voice	1	0	2	10	5	7	4	3	8	9	6	11
		11	10	0	8	3	5	2	1	6	7	4	9
		3	2	4	0	7	9	6	5	10	11	8	1
		8	7	9	5	0	2	11	10	3	4	1	6
		6	5	7	3	10	0	9	8	1	2	11	4
		9	8	10	6	1	3	0	11	4	5	2	7
		10	9	11	7	2	4	1	0	5	6	3	8
		5	4	6	2	9	11	8	7	0	1	10	3
		4	3	5	1	8	10	7	6	11	0	9	2
		7	6	8	4	11	1	10	9	2	3	0	5
		2	1	3	11	6	8	5	4	9	10	7	0

E= 0-diagonal

Figure 9.

Karl Philipp Moritz, Schriften zur Ästhetik und Poetik, ed. Hans Joachim Schrimpf (Tübingen: Max Niemayer Verlag, 1962).

DIE SIGNATUR DES SCHÖNEN / In wie fern Kunstwerke beschrieben werden können? (1978; pp. 93-103). My thanks to Reinhold Brinkmann for drawing this essay to my attention.

The double virgule (/ /) indicates a new paragraph.

Als *Philomele* ihrer Zunge beraubt war, webte die die Geschichte ihrer Leiden in ein Gewand, und schickte es ihrer Schwester, welche es aus einander hüllend, mit furchtbarem Stillschweigen, die gräßliche Erzählung las. // Die stummen Charactere sprachen lauter als Töne, die das Ohr erschüttern, weil schon ihr bloßes *Daseyn* von dem schändlichen Frevel zeugte, der sie veranlaßt hatte. // Die Beschreibung war hier mit dem Beschriebenen eins geworden—die abgelöste Zunge sprach durch das redende Gewebe. // Jeder mühsam eingewürkte Zug schrie laut um Rache, und machte bey der mitbeleidigten Schwester das mütterliche Herz zum Stein. // Keine rührende Schilderung aus dem Munde irgen eines Lebendigen, konnte so, wie dieser stumme Zeuge, wirken. // Denn nichts lag ja dem Unglück der weinenden Unschuld *näher*, und war so innig damit verwandt, als eben dieß mühsame Werk ihrer Hände, wodurch sie allein ihr *Daseyn* kund thun, und ihre Leiden offenbaren konnte. // Eben darum konnte es seiner schrecklichen Wirkung nicht verfehlen. (p. 93)

[When *Philomel* was robbed of her tongue, she wove the story of her sufferings into a tapestry, and sent it to her sister, who, unrolling it, read the grisly tale in frightful silence. The mute characters spoke louder than sounds assailing the ear, since their very *existence* bore witness to the despicable outrage that had been the cause of their production. Description, here, became as one with the thing described—the severed tongue spoke through the eloquent web. Every painstakingly interwoven thread cried aloud for revenge, and hardened to stone the maternal heart of the concurrently offended sister. No moving description from the mouth of any living person could have produced the effect made by this mute witness. For indeed nothing lay *closer* to the misfortune of the weeping innocent, nothing was so intimately connected with it, as just this laborious work of her hands. In that medium alone could she portray her being, and make known her sufferings. Exactly for that reason it could not fail to produce its horrible effect.]

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Figure 10.

... unsre ganze Aufmerksamkeit mehr auf die Beschreibung selbst, als auf die beschriebene Sache gezogen wird, die wir durch die Beschreibung nicht sowohl kennen lernen, als vielmehr sie in ihr *wieder erkennen* wollen. (Moritz, p. 99)

[...our entire attention is drawn more to the description itself, than to the things described. We do not so much come to know those things through their description; rather, through the description, we desire much more to *apprehend* the things [as if (? DL)] *once more*.]

This approach to the piece opens up a host of suggestive critical questions. Does the live singer weave the piece, like Philomel, while the audience listens like Procne? And does the singer, as weaving Philomel, imagine how Procne will respond when she hears the piece? Or does the singer, like Procne, read an already-created piece? The roles of the two sisters seem to interpenetrate in the live singer, weaving in and out, both telling and reading the story. Is the tape Philomel a different psychological level of the singer? Or is Philomel-on-the-tape an analog for Philomel-in-the-tapestry? Both tape and tapestry unroll, to tell their stories. It seems clear to me that there are elements of all these ideas in the drama, and that is one thing which makes the piece so theatrical. Since the taped voice is always Bethany Beardslee's, the issues are very keen for those of us who first heard Beardslee as the live singer, and are now hearing other sopranos in that role.

Figure 11a, to explore other theoretical metaphors, transcribes the main theme from the first movement of Schubert's G major quartet. Figures 11b through 11e provide my analysis using Schenkerian techniques and hence, Schenkerian metaphors. The analysis purports to show how the theme elaborates the structure of an underlying G major triad. The underlying triad is shown at level (e). The analytic method presumes that there IS such a phenomenon, and tells us how to go about constructing or reconstructing it. According to this presupposition, the G major at the end of the theme projects THE SAME (e)-level PHENOMENON as does the G major at the beginning of the theme. The end of the theme thereby metaphorically RETURNS to something from which it departed. More

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precisely, the end of the theme triggers a dialectic process whereby we can synthesize the ending and the beginning G majors into one higher level phenomenon, THE G major triad of level (e). Here, the term THE is perfectly correct. A special power of the system is that we can metaphorically identify the conceptual triad of level (e) with the acoustic signal that opens the quartet. An enormous structural significance can thereby be projected metaphorically by an almost instantaneous acoustic event.

Figure 11.

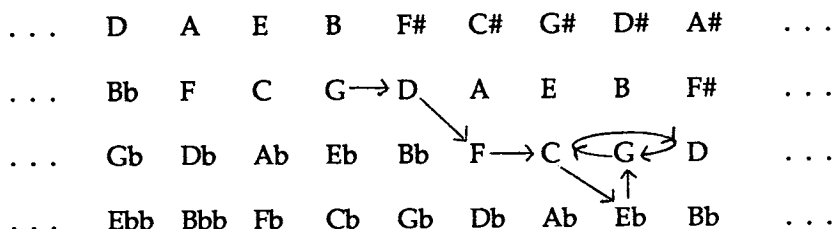
Figure 11 displays five staves of musical notation, labeled a through e, illustrating a dialectic process in music theory.

- Staff a:** Shows a melodic line starting at measure 15 (marked with a box around 15) and ending at measure 24 (marked with a box around 24). The notation includes a *pp* (pianissimo) dynamic marking and an *(ext.)* (extended) marking. The melody is written in a treble clef with a key signature of one sharp (F#).
- Staff b:** Shows a melodic line starting at measure 5 and ending at measure 1. The notation includes a *Zug 6-3* (pull 6-3) marking and a *5* (fifth) marking. The melody is written in a treble clef with a key signature of one sharp (F#).
- Staff c:** Shows a melodic line starting at measure 5 and ending at measure 1. The notation includes a *5* (fifth) marking and a *4* (fourth) marking. The melody is written in a treble clef with a key signature of one sharp (F#).
- Staff d:** Shows a melodic line starting at measure 5 and ending at measure 1. The notation includes a *4* (fourth) marking and a *3* (third) marking. The melody is written in a treble clef with a key signature of one sharp (F#).
- Staff e:** Shows a melodic line starting at measure 5 and ending at measure 1. The notation includes a *5* (fifth) marking and a *4* (fourth) marking. The melody is written in a treble clef with a key signature of one sharp (F#).

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Figure 12 analyzes the theme as a journey on a map of chord or key relations promulgated by Hugo Riemann.¹⁶ A step east on the map moves the root of the harmony a fifth up; a step south moves the root a major third down. Even in equal temperament, the different G's on the map represent different conceptual places. Hence the theme, according to this theoretical metaphor, ends IN A DIFFERENT PLACE from where it began, rather than RETURNING to its beginning, or metaphorically projecting ONE higher-level phenomenon. We can even say that the theme MODULATES, from G-in-row-2 of the map, to G-in-row-3.

Figure 12.



The modulation is carried out by a repeating harmonic progression at the opening of the theme, a progression represented by a strong visual motif on the map-journey. The motif comprises a step east and then a step southeast. It projects a threat to wander off indefinitely east-by-southeast over the map, never centering around any tonic. Carl Dahlhaus feels the power of this metaphor when he writes that the progression from E-flat to G yanks the harmonic motif "forcefully back from its progression, or regression into the infinite."¹⁷ Dahlhaus is apparently not sensitive to the metaphorical modulation on Figure 12, when he hears the theme coming "back" to the final G on Figure 12. I think he is mixing metaphors; the idea that there is only ONE Hegelian G-major triad associated with the theme is strongly present in Figure 11, but just as strongly absent from Figure 12.

It would be the reverse sort of metaphor-mixing, to try to capture the Riemann motif on the Schenker sketch. Among other things, it would lead to excruciating contrapuntal fifths at the same level, as on Figure 13. Compare Figure 11b and c, where the structural upper voice descends in parallel sixths, not fifths, over the bass.

Figure 13.



Early on, I spoke of music theory as describing “a conceptually structured sound-world that was categorically prior to any particular musical event, score, or experience.” I should like now to show how immediately an abstract feature of the conceptual world can impinge upon practical musical performing experience. Figure 14 shows what Elizabeth West Marvin, in a strong and suggestive recent *Spectrum* article, calls a “dseg.”¹⁸ That is the numerical series <02113>.

Figure 14.

dseg class <02113> contains (for instance) the durational series

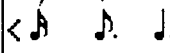
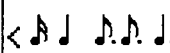
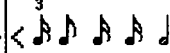
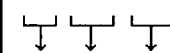
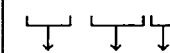
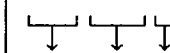


The dseg designates the class of all 5-event durational series whose first event is shortest, whose third and fourth events, of equal duration, are longer, whose second event is longer yet, and whose fifth event is the longest. A specimen durational series belonging to the dseg class is also shown in Figure 14.

If the first, third, and fifth events are extracted from any durational series in this dseg class, clearly the first event will be shortest, the third event next shortest, and the fifth event longest. The three-event subseries will then necessarily belong to dseg class <012>. The top half of Figure 15 shows such subseries for various durational series of dseg class <02113>; all the subseries are of class <012>, as they must be. Marvin, in her text, calls <012> here a “noncontiguous dsubseg” of <02113>, observing correctly that the notion is of very limited musical interest.

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Figure 15.

dseg class of noncontig. subser.	$\langle 012 \rangle$	$\langle 012 \rangle$	$\langle 012 \rangle$
noncontiguous subseries of <ord 1, ord 3, ord 5>			
durational series (each in dseg class <02113>)			
grouped partial summing as <ord(1+2), ord (3+4), ord 5>			
dseg class of partial sum series	$\langle 201 \rangle$	$\langle 011 \rangle$	$\langle 102 \rangle$

Marvin's pertinent musical example, however, confuses this notion with a notion of great musical interest, one I shall call a *grouped partial summing* from a given durational series. Given a five-note durational series, we can, for instance, construct one grouped partial summing by considering the sum of the first and second durations, then the sum of the third and fourth durations, and finally the fifth duration. The bottom half of Figure 15 shows these grouped partial summings for the various durational series of the figure. Even though all three five-note series are of the same dseg class, the grouped summings belong to different dseg classes.

The bottom row of Figure 15 thus *refines* the rhythmic contour description of the three five-event series. Indeed by means of the bottom row we can *distinguish* each series from the others. Even though all are in the same five-event dseg class, they are in distinct three-event dseg-classes as regards the partial sum series formed under the indicated grouping.

Similarly, the various 3-event series of Figure 16 can be distinguished, not by their overall dseg classes, which are all the same, but by the various dseg classes of their partial sum series formed under the indicated group-

ing. This can be a very practical aid to a performer, and not just a performer of recent music. Figure 16 suggests that, to get the dotted figure of column B precise, you can imagine it as if in 6/8 meter or Franconian third mode, and then check that the two parts of the gesture feel of equal duration. If the latter part of the gesture feels too long, you are erring in the direction of column A; lengthen your dot. If the latter part of the gesture feels too short, you are erring in the direction of column C; shorten your dot.¹⁹

Figure 16.

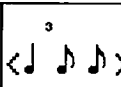
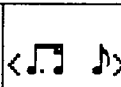
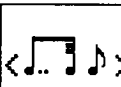
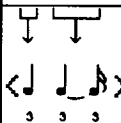
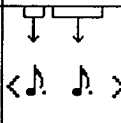
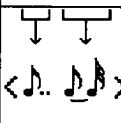
	A	B	C
durational series (each in dseg class <201>)			
grouped partial summing as <ord 1, ord (2 + 3)>			
dseg class of part. sum series	<01>	<00>	<10>

Figure 17 applies the theory to a very specific practical problem, that of performing the opening measure from Stockhausen's first piano piece. The music is given in Figure 17a. Figure 17b gives a pertinent mensural series, assigning a unit duration to the opening note of the music. Figure 17c gives the dseg which pertains to figure 17b. 17c does not give us much help in preparing a performance.

But partial sum groupings do. Figure 17d shows a grouping indicated by the composer's notation: the duration of the entire septuplet grouping is equal to the duration of the preceding low E^b and F combined. Figure 17e gives the mensural series <1,5,5> into which the measure is thereby articulated. Figure 17f gives the dseg class of that gesture, <011>: something shorter is followed by two instances of something longer.

Figure 17e projects a large rhythmic feeling for the measure but is too coarse; figure 17b is accurate but too fussy. A very useful intermediate grouping of partial sums can be found in figure 17g; the mensural series of sums is given by Figure 17h. Figure 17h renotates the sums for easier comparison. The fourth number of 17h' is a bit more than the third; the fifth

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number is a bit less than the second. Figure 17h" tries to capture the idea by using the symbols alpha, beta, beta-plus, and alpha-minus; here alpha and beta sum to 5; so do beta-plus and alpha-minus.

Figure 17i gives a dseg for 17h, modified according to some ideas of Larry Polansky.²⁰ Here "1 plus" signifies that the fourth duration is about equal to the third, but just a bit longer. The modified dseg interprets the music as a short event, followed by a long event, followed by an event of middle length, followed by a slightly elongated middle-length event and a slightly abbreviated long event. Figure 17j fleshes out the idea. Here, tempo 2 should be chosen so that beta-plus feels like a slightly ritarded beta-span, while alpha-minus feels like a slightly accelerated alpha-span, as it were "going into" the barline of measure 2. We can have those feelings even though written eighth equals written eighth throughout tempo 2.

Figures 17g through j explore only one grouped partial summing, one from among many theoretically available groupings. The particular grouping of 17j interacts strongly with the pedaling and with the hexachordal structure of measure 1, a structure that carries on into the piece as a whole.

So the apparently austere machinery of the conceptual a priori theory impinges upon this specific musical experience so as to engage notions of musical grouping, of feeling a bit shorter, of feeling slightly accelerated, going into the barline, and so forth. And yet the partial sums were indeed, as my harmony student said, "just theory." We theorists know from experience how to tolerate the sarcasm of that remark, but we shall also feel some professional pride in the honor it implicitly confers upon us.

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Figure 17.

a.



b. < 1 3 2 (5/7) (5/7) (5/7) (15/14) (5/14) (5/7) (5/7) >

c. <2541113011>

d. < 1 3 2 | everything else | >

e. < 1 5 | 5 | >

f. <011>

g. < 1 3 2 (5/7) (5/7) (5/7) (15/14) (5/14) (5/7) (5/7) >

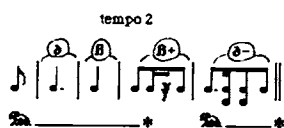
h. < 1 3 2 3 X (5/7) 4 X (5/7) >

h'. < 1 (21/7) (14/7) (15/7) (20/7) >

h''. < 1 ∂ β β^+ ∂^- >

i. < 0 2 1 1+ 2- >

j.



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NOTES

¹David Lewin, "Behind the Beyond, A Response to Edward T. Cone," *Perspectives of New Music* 7.2 (Spring-Summer 1969): 59-72. The quoted material is on page 61.

²*Idem*, *Generalized Musical Intervals and Transformations* (New Haven: Yale University Press, 1987).

³Gioseffo Zarlino, *Institutioni harmoniche*, 2nd ed. (Venice: Senese, 1573). Facsimile reproduction (Ridgewood, N.J.: Gregg Press, 1966).

⁴*Ibid.*, book 1, chapter 16 (p. 33). "Mezzano termino harmonico" COULD simply mean a whole number lying between 8 and 5. Coming where it does, though, the expression seems arch if not tendentious. It recalls the same expression, used to describe the "mezzano termino harmonico" 5 that lies between 6 and 4. In that context, we are surely to understand the "mezzano termino harmonico" as a "harmonic mean."

⁵*Ibid.*, book 3, chapter 21. "sono composte . . . della Diatesseron et del Ditono, over del Semiditono; . . ." (p. 131).

⁶Oliver Strunk, *Source Readings in Music History* (New York: W. W. Norton & Company, Inc., 1950), 30-31.

⁷Francois-Joseph Fétis, *Traité de l'harmonie*, 12th ed. (Paris: Braudus et Cie, 1879).

⁸*Ibid.*, table "des intervalles naturels," p. 6.

⁹*Ibid.*, table "des intervalles consonants," p. 9.

¹⁰David Lewin, "Music Theory, Phenomenology, and Modes of Perception," *Music Perception* 3.4 (Summer 1986): 327-92.

¹¹Marion Guck's key article is "Musical Images as Musical Thoughts: The Contribution of Metaphor to Analysis," *In Theory Only* 5.5 (June 1981): 29-42.

¹²Richard Swift, "Some Aspects of Aggregate Composition," *Perspectives of New Music* 14.2/15.1 (1976): 236-48. The score and matrix are on pages 242-43.

¹³John Hollander, *Vision and Resonance*, 2nd ed. (New Haven: Yale University Press, 1985), 294-97.

¹⁴Funk & Wagnall's, *Standard Universal Dictionary* (New York: Garden City Publishing Co., Inc., 1946), 491.

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¹⁵J. N. Adams, *The Latin Sexual Vocabulary*, Paperbacks edition (Baltimore: The Johns Hopkins University Press, 1990), 105-08.

¹⁶Hugo Riemann, *Grosse Kompositionslehre*, vol. 1 (Berlin and Stuttgart: W. Spemann, 1902), 479.

¹⁷Carl Dahlhaus, "Sonata Form in Schubert," trans. Thilo Reinhard, in *Schubert, Critical and Analytical Studies*, ed. Walter Frisch (Lincoln: University of Nebraska Press, 1986), 10.

¹⁸Elizabeth West Marvin, "The Perception of Rhythm in Non-Tonal Music," *Music Theory Spectrum* 13.1 (Spring 1991): 61-78.

¹⁹The eighth-note duration of figure 14 is crucial here, not just the preceding long-short pattern. For that reason Marvin's footnote 13 is not directly engaged, though it is interesting in this context.

²⁰Larry Polansky, "Possible and Impossible Melody: Some Formal Aspects of Contour," lecture at the meeting of the Society for Music Theory in Oakland, CA, November 11, 1990.