# Rothstein's Paradox and Neumeyer's Fallacies

**Matthew Brown**

In a recent review co-written with Julian Hook, David Neumeyer reaches some rather pessimistic conclusions about Schenkerian theory.[1] He believes that the latter is caught in a no-man's land between interpretative practice and scientific theory; he sees inherent problems not only with the ways in which Schenkerians interpret individual works, but also with the ways in which Lerdahl and Jackendoff try to ground Schenker's ideas in cognitive science. According to him, Schenkerian theory is rapidly being overtaken by its rivals and is in serious danger of becoming as "outdated as the earliest forms of classical pitch-class set theory."[2]

Neumeyer bases his view on what he regards as a fundamental contradiction in Schenkerian reception and pedagogy. Given the premise that Schenkerians want to remain faithful to Schenker's original ideas while at the same time transmitting them to as many people as possible, Neumeyer believes that to be faithful Schenkerians cannot hope to be intelligible to everyone and to be intelligible to everyone they cannot hope to be faithful.[3] Neumeyer illustrates this alleged paradox with an example taken from Rothstein. While Schenker insisted that pieces can be understood properly only by recognizing the interrelationship between the background and the foreground, Rothstein concedes that most students and non-theorists should be "taught only how to interpret the foreground."[4]

[1]David Neumeyer and Julian L. Hook, "Review: *Analysis of Tonal Music: A Schenkerian Approach*," by Allen Cadwallader and David Gagné," *Intégral* 11 (1997): 205–222. I would like to thank Panayotis Mavromatis and Douglas Dempster for their many helpful suggestions.

[2]*Ibid.*, p. 222.

[3]There is, according to Neumeyer, "a fundamental contradiction between fixed ideological principles and the compromises needed for more general acceptance." *Ibid.*, p. 218.

[4]William Rothstein, "The Americanization of Heinrich Schenker," in *Schenker Studies*, ed. Hedi Siegel (Cambridge: Cambridge University Press,

Neumeyer finds Rothstein's paradox devastating. To quote him, "although it is undoubtedly true that 'backgrounds and even middlegrounds are not for everybody,' they are for *somebody*; and, so long as the *Ursatz*—the heart and soul of Schenker's ideology—remains, the specter of compromise will hover over every practitioner and pedagogue."[5] For Neumeyer:

> the only solution is to reject the assumptions that gave rise to the paradox in the first place: either abandon the *Ursatz* or abandon the notion that Schenker's method constitutes a theory.[6]

He immediately restates these two options as follows: "either accept complexity and potential multiplicities in hierarchical design or accept that Schenker's first priority was cultural ideology."[7] This response echoes challenges made earlier by Richard Cohn.[8] After noting that few theorists support Schenker's *Weltanschauung*, Cohn claims: "If it is possible to detach Schenker's analytic methods from his epistemology, then it might not be so damaging to snip somewhat higher up the tree, by isolating them from some other music-theoretic tenets."[9]

As both a practitioner and a pedagogue of Schenkerian theory, I share many of Neumeyer's frustrations: Schenker's work is undoubtedly very hard to teach and in desperate need of shoring up intellectually. But since I don't believe that Rothstein's paradox is really a paradox at all, I don't buy Neumeyer's

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1990), p. 201. Schenker explained the interrelationship between background and foreground as follows: "Thus a simple element lies at the back of every foreground. The secret balance in music ultimately lies in the constant awareness of the transformational levels and the motion from foreground to background or the reverse. This awareness accompanies the composer constantly; without it, every foreground would degenerate into chaos." Heinrich Schenker, *Neue musikalische Theorien und Phantasien, Vol. 3: Der freie Satz* (Vienna: Universal, 1935), § 29, p. 41; Ernst Oster trans., *Free Composition* (New York: Longman, 1979), p. 18.

[5]Neumeyer and Hook, "Review: Analysis of Tonal Music," p. 219.

[6]*Ibid.*

[7]*Ibid.*

[8]Richard Cohn, "The Autonomy of Motives in Schenkerian Accounts of Tonal Music," *Music Theory Spectrum* 14/2 (1992): 150–170.

[9]*Ibid.*, p. 170.

prognosis; just as I find it fallacious to suppose that we must choose between keeping the *Ursatz* and acknowledging Schenker's method as a valid theory, so I also find it fallacious to assume that we must pick between accepting multiple hierarchies and treating *Ursätze* as cultural constructs. These are simply false dichotomies. It seems equally implausible to follow Cohn's suggestion and sever Schenker's analytical methods from their main theoretical tenets; in my opinion, such snipping would ultimately be very costly. Since Neumeyer's fallacies stem from a myopic view of *Ursätze*, I'll begin by reconsidering this crucial concept. Once I've explained its nature and testability, I'll respond in detail to Neumeyer and Cohn, ending by suggesting some ways to teach Schenkerian theory that avoid Rothstein's paradox.

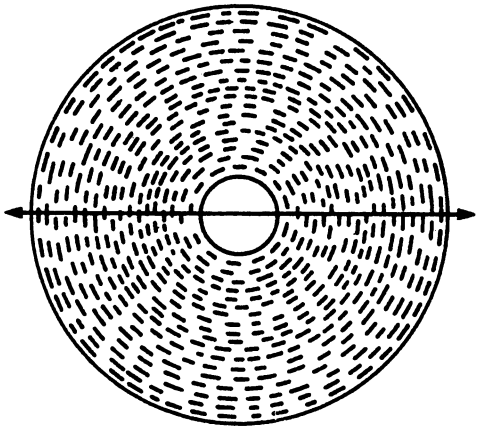
## 1. What are *Ursätze* and why can't they go to eleven?

Although experts disagree about what Schenker's main contribution to music theory may have been, a prime candidate is surely his concept of the *Ursatz*. The idea that complete, continuous monotonal pieces can be derived from a single prototype is undoubtedly a powerful one that has enormous musical and cognitive implications. William Pastille and others have shown that Schenker actually adapted it from Goethe, who regarded prototypes (or *Urphänomene*) as conceptual models that underlie "all the physical manifestations of a class of creatures, objects, or phenomena."[10] Pastille illustrates Goethe's claim with an example given in Figure 1. Here, the outer circle circumscribes the general class under consideration, the dots represent specific members of that class, the inner circle denotes the prototype, and

[10]William Pastille, "Music and Morphology: Goethe's Influence on Schenker's Thought," in *Schenker Studies*, ed. Hedi Siegel (Cambridge: Cambridge University Press, 1990), pp. 29–44. According to Pastille, Goethe used the word 'type' "when the class under consideration consists of living organisms" and '*Urphänomen*' "when the class consists either of inorganic objects or phenomena" (p. 30).

the arrows show that the closer individuals are to the prototype, the more they resemble it.[11]

*Figure 1. Goethe's conception of the* Urphänomen.



Since prototypes are abstractions we use to categorize our knowledge of some class of things, a given individual may not display every feature of the prototype. As Alvin Goldman explains: "an object is categorized as an instance of a concept if it is sufficiently similar to the prototype, similarity being determined (in part) by the number of properties in the prototype possessed by the instance and by the sum of their weights."[12] For example, although the prototypical cat is a mammal with retractable claws, a craving for canned tuna, fur, a

[11]Adolf Meyer-Abich, *Die Vollendung der Morphologie Goethes durch Alexander von Humboldt* (Göttingen, 1970), p. 35; cited by Pastille, "Music and morphology," pp. 30–31.

[12]Alvin I. Goldman, *Philosophical Applications of Cognitive Science* (Boulder: Westview Press, 1993), p. 128.

tail, and a capacity to purr, not all cats display these features or forms of behavior. In fact, cheetahs don't have retractable claws and don't like tuna fish; Manx cats don't have tails; lions, tigers, and leopards don't purr; and Mr. Bigglesworth doesn't have any fur at all! Perfect examples of a prototype may not "exist" in the world around us; they may be idealizations that combine features from many different individuals. It was for this reason that, on hearing Goethe's definition of a prototype, Schiller declared, "That is not an experience, that is an idea."[13]

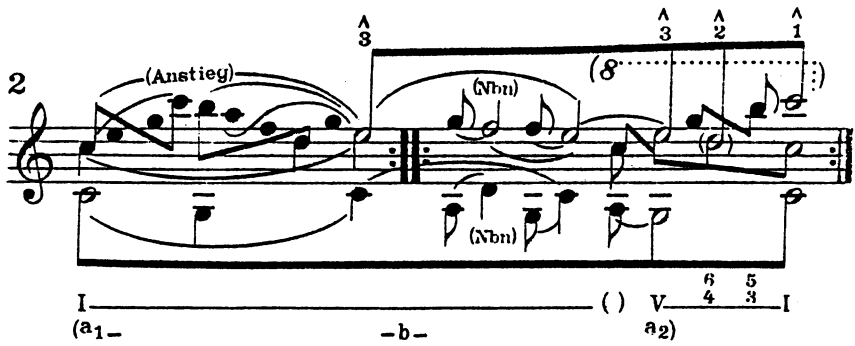
Following Schiller, there are good reasons to treat *Ursätze* as "ideas" rather than as "experiences." While *Ursätze* can sometimes be experienced directly at the surface of the music, Schenker claimed that they are more than surface cadence patterns; he insisted that without the global knowledge they convey, "the simplest linear progressions in the foreground are still inaccessible even to very sensitive ears."[14] And, just as individual cats may not display every feature of feline-ness, so individual pieces may not display every feature of tonality. In Figure 2a, for example, Schenker claimed that $\hat{2}$ of the *Urlinie* is implied in the score, while in Figure 2b he proposed that the diatonic $\flat\hat{6}$ of the *Urlinie* is substituted by a chromatic $\hat{6}$ in the music. Schenker also noted that *Ursätze* provide us with insights about the nature of expert tonal composition: "great composers—in contrast to performers and listeners—experienced even their most extended works not as a sum total of measures or pages, but as entities which could be heard and perceived as a whole."[15]

[13]Pastille, "Music and Morphology," p. 31, footnote 8.

[14]See Schenker, *Der freie Satz*, § 50, p. 52; Oster trans., *Free Composition*, p. 27. Regarding the differences between *Ursätze* and cadences, see Schenker, *Der freie Satz*, § 28, p. 40; Ernst Oster trans., *Free Composition*, pp. 17–18.

[15]Schenker, *Der freie Satz*, p. 6; Ernst Oster trans., *Free Composition*, p. xxiii. Schenker also suggested that performers can benefit from understanding the *Ursatz*, see *Free Composition*, p. 8.

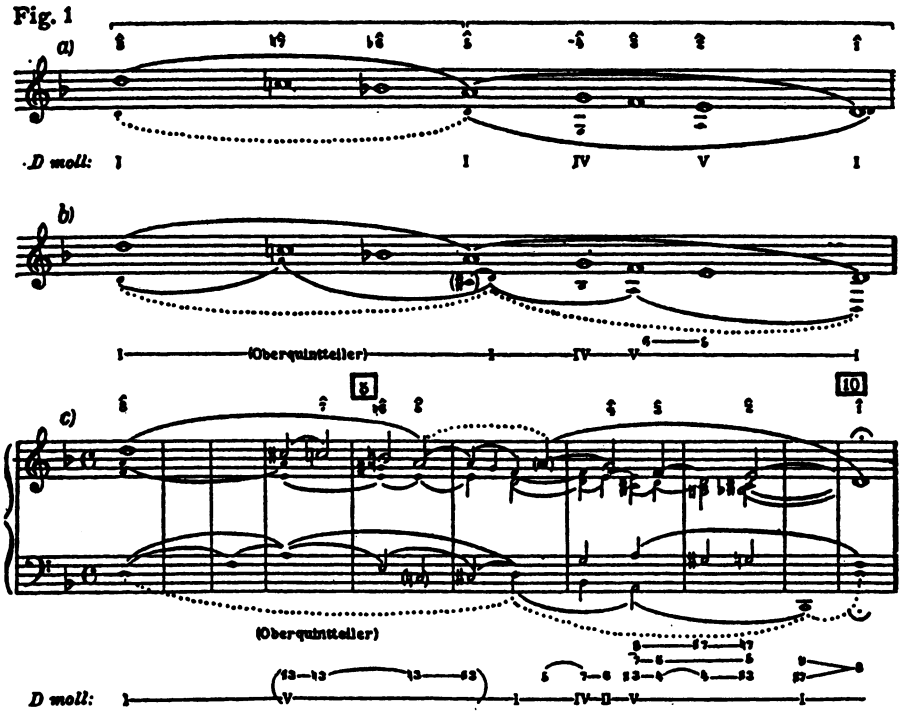
*Figure 2a. Implied Tones in the* Ursatz:
*Schubert*, Valses Nobles, *op. 77, D. 969.*
*Schenker*, Der freie Satz, *Fig. 46.2.*[16]




What features, then, are common to all tonal pieces? After some reflection, it is clear that these features cannot be thematic, rhythmic, or formal in nature because themes, rhythms, and forms are precisely the things we use to distinguish one piece or type of piece from another. Instead, it seems more reasonable to suppose that pieces by Mozart or Bach sound tonal because their constituent notes behave in some ways and not in others. This, of course, was precisely Schenker's position; he believed that tonal pieces conform to certain general laws of voice leading and harmony, and that these laws transform the laws of strict

[16]Examples from Heinrich Schenker's *Das Meisterwerk in die Musik, Vol. 1* (© Copyright 1925 by Universal (Vienna) Ltd. Copyright renewed), *Neue musikalische Theorien und Phantasien, Vol. 2: Kontrapunkt* and *Neue musikalische Theorien und Phantasien, Vol. 3: Der freie Satz* (© Copyright 1935 by Universal (Vienna); Oster trans., *Free Composition* (© Copyright 1979 by Longman (New York) Copyright Renewed). are reprinted by permission of Universal.

*Figure 2b. Substitute Tones in the* Ursatz:
*Bach*, Little Prelude in D minor, *BWV 940.*
*Schenker*, Das Meisterwerk in der Musik, *Vol. 1 (1925), p. 99.*



counterpoint as Fux outlined them in his discussion of First Species for two voices.[17] For the record, Fux himself realized that the laws of strict counterpoint alter when the counterpoint contains more than one note and more than one voice against each note of the *cantus firmus*.[18] After complaining about his gout, Fux concluded his discussion of four-voice counterpoint by noting that "as the number of voices increases, the rules are to be less rigorously observed."[19]

To see what this means, Figure 3 compares Fux's laws of strict counterpoint with Schenker's laws of tonal voice leading. These laws are divided into three types: laws of melodic motion and closure (Figure 3a); laws of relative motion and closure (Figure 3b); and laws of vertical spacing (Figure 3c). Moreover, each law is classified in several ways: some cover global properties and are marked G, whereas others cover local properties and are marked L; and some can be regarded as main laws and are marked M, whereas others are subordinate to them and are marked S.

Even from a quick glance at Figure 3a, we see that Fux's main laws of melodic motion and closure differ slightly from those of Schenker. Whereas *cantus firmi* and counterpoints in strict style typically begin on $\hat{1}$ and move by whole- and half-step, tonal melodies can begin on $\hat{8}$, $\hat{5}$, or $\hat{3}$ and can even include augmented steps. Fux's subordinate laws are also different from Schenker's; whereas the former simply describe which leaps are

[17]Schenker expressed this view as early as the *Harmonielehre*, esp. § 91, and throughout *Kontrapunkt* I–II. See Heinrich Schenker, *Neue musikalische Theorien und Phantasien*, Vol. 1: *Harmonielehre* (Stuttgart and Berlin: Cotta, 1906); *Harmony*, ed. Oswald Jonas and trans. Elisabeth Mann Borgese (Chicago: University of Chicago Press, 1954) and Vol. 2: *Kontrapunkt I* (Stuttgart and Berlin: Cotta, 1910), *Kontrapunkt II* (Vienna: Universal, 1922); *Counterpoint I and II*, ed. John Rothgeb and trans. John Rothgeb and Jurgen Thym (New York: Schirmer, 1987). For a rather different interpretation of what Schenker might have meant, see Joseph Dubiel, "When You are a Beethoven: Kinds of Rules in Schenker's Counterpoint," *Journal of Music Theory* 34/2 (1990): 291–340, esp. pp. 292–93.

[18]Johann Joseph Fux, *Gradus ad parnassum* (Vienna: Johann Peter van Ghelen, 1725); ed. and trans. Alfred Mann, *The Study of Counterpoint*, rev. ed. (New York: Norton, 1973).

[19]Mann, *The Study of Counterpoint*, p. 139.

*Figure 3a. Laws of melodic motion and closure.*

| Strict Counterpoint | | Tonal Voice Leading |
|---|---|---|
| If a *cantus firmus* is maximally closed, then it begins on $\hat{1}$ and ends $\hat{2}$–$\hat{1}$. | GM | If a melody is maximally closed, then it begins on $\hat{8}$, $\hat{5}$, or $\hat{3}$, and ends $\hat{2}$–$\hat{1}$. |
| If a *cantus firmus* is prototypical, then it essentially moves by whole- and half-steps, with no repeated tones. | LM | If a melody establishes a single tonality, then it essentially moves by step. |
| If leaps occur, then they are never larger than an octave and never encompass diminished/augmented intervals or the interval of a seventh. | LS | If leaps occur, then they do so when the melody shifts from one harmonic tone to another or from one contrapuntal voice to another. |
| If leaps occur, then they never appear successively in the same direction and are normally approached and departed from by step in the opposite direction. | LS | |

*Figure 3b. Laws of relative motion and closure.*

| Strict Counterpoint | | Tonal Voice Leading |
|---|---|---|
| If the counterpoint is maximally closed, then it begins on $\hat{8}$/U or $\hat{5}$, and ends $\hat{7}$–$\hat{1}$. | GM | If the voice leading is maximally closed, then the voices begin on $\hat{8}$, $\hat{5}$, or $\hat{3}$. The "alto" ends $\hat{7}$–$\hat{1}$, the bass $\hat{5}$–$\hat{1}$, and the "tenor" by step onto $\hat{5}$ or $\hat{3}$. |
| If the counterpoint is strict, then it essentially moves in contrary motions with the *cantus firmus*. | LM | If the voice leading is tonal, then the soprano and bass essentially move in contrary motion with each other. |
| If the counterpoint and the *cantus firmus* move in the same direction, then parallel perfect octaves and fifths do not occur between successive notes. | LS | If two essential lines move in the same direction, then parallel perfect octaves and fifths do not occur between successive harmonic tones. |
| | LSS | If parallel perfect octaves and fifths occur, then they arise from doubling/ figuration or from combinations of non-harmonic tones. |

*Figure 3c. Laws of vertical spacing.*

| Strict Counterpoint | | Tonal Voice Leading |
|---|---|---|
| If the counterpoint is strict, then it begins/ends on consonant intervals. | GM | If the voice leading is tonal, then it begins/ends on members of the tonic triad. |
| If the counterpoint is strict, then it is essentially consonant. | LM | If the voice leading is tonal, then it is essentially triadic. |
| If dissonances occur, then they arise from immediate step motion between consonances. | LS | If non-harmonic tones occur, then they move by step between harmonic tones or by leap between contrapuntal lines. |

possible, the latter explain that leaps arise when the melody shifts between harmonic tones or between contrapuntal voices.

Schenker made similar adjustments to the laws of relative motion and closure (see Figure 3b). Although he was adamant that the outer voices in tonal counterpoint tend to move by contrary motion, Schenker acknowledged that parallel perfect octaves and fifths can occur in tonal contexts.[20] Some of these parallels stem from "unessential" doublings or figuration. For example, the parallel octaves in Figure 4a arise because the right and left hands double the alto and tenor voices. Others, however, stem from combinations of non-harmonic tones. For example, the parallel perfect fifths in Figure 4b arise from a passing motion E–D–C♯ in the tenor plus an anticipation A in the soprano, those in Figure 4c arise when the passing motion C–B♭–A in the

[20]Schenker, *Der freie Satz*, § 161, p. 93; Ernst Oster trans., *Free Composition*, p. 56.

soprano collides with the passing motion F–E♭–D–C in the alto.[21]

With regards to vertical spacing, Fux's laws again differ from Schenker's (see Figure 3c). Although both stress the significance of consonant textures, Schenker believed that non-harmonic tones ultimately arise from step motion between harmonic tones. To explain leaping non-harmonic tones, he offered two types of explanation: in Figure 5a–b, the leaping sevenths are explained as implied register transfers; in Figure 5c, the cambiata is explained as a motion between different polyphonic voices.[22]

Besides insisting that Fux's laws must be transformed to explain the behavior of tonal voice leading, Schenker also maintained that they must be supplemented by various laws of tonal harmony. As shown in Figure 6a, Schenker's laws of harmonic classification are limited by contrapuntal factors. For example, since the interval of the perfect fourth is dissonant when it occurs above the bass, Schenker limited the number of essential harmonies to major, minor, and diminished triads (either 5/3 or 6/3). He claimed that augmented triads, 6/4 chords, and seventh-chords can never serve as essential harmonies.[23]

[21]Schenker listed the following combinations of non-harmonic tones: "a principal note with an accented or unaccented passing tone or with a neighboring note; a passing tone with an anticipation, with an accented passing tone, or with a neighboring note; a neighboring note with another neighboring note, with the concluding turn of a trill, or with a suspension; the resolution of a suspension with a passing tone, with another suspension, and so forth." Schenker, *Der freie Satz*, § 164, p. 98; Ernst Oster trans., *Free Composition*, p. 59.

[22]For detailed discussions of this passage, see Oswald Jonas, *Einfuhrung in die Lehre Heinrich Schenkers* (Vienna: Im Saturn Verlag, 1934), ed. and trans. John Rothgeb, *Introduction to the Theory of Heinrich Schenker* (New York: Longman, 1982), p. 97ff. and Don Traut, "Counterpoint, Form, and Tonality in the First Movement of Stravinsky's Concerto for Piano and Wind Instruments," (M.M. Thesis, Louisiana State University, 1995), pp. 48–51.

[23]As he made clear at the start of *Kontrapunkt I*: "The *Stufe* exists in our perception only as a triad; that is, as soon as we expect a *Stufe*, we expect it first of all only as a triad, not as a seventh chord." Schenker, *Kontrapunkt I*, trans. John Rothgeb and Jürgen Thym., *Counterpoint* I, p. xxxi. This view changed from the *Harmonielehre*; see §§ 99–106.

*Figure 4a. Parallels by doubling and figuration.*

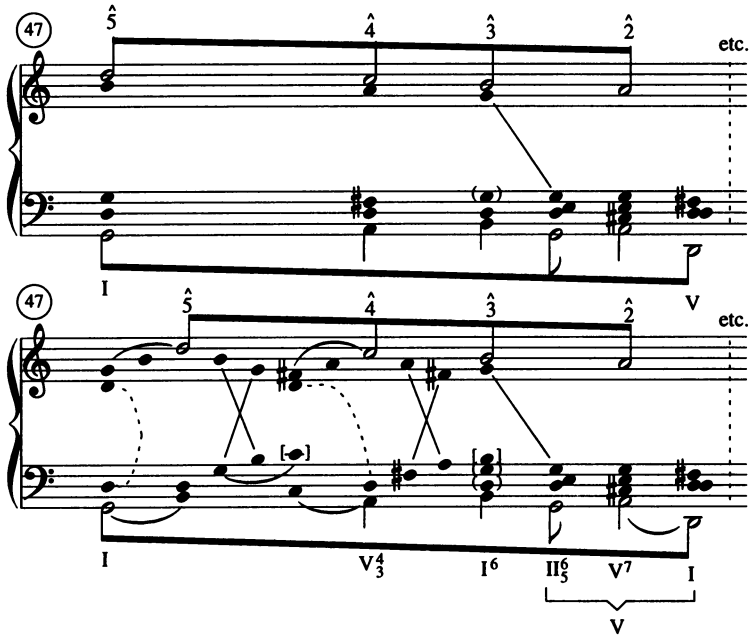



*Figure 4b. Parallels by combinations of non-harmonic tones (passing tone with anticipation): Cherubini,* Medea.

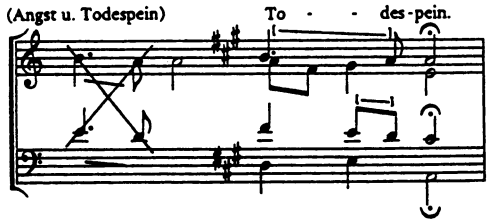


*Figure 4c. Parallels by combinations of non-harmonic tones (accented and unaccented passing tones): Cherubini,* Missa Solemnis *in d minor.*

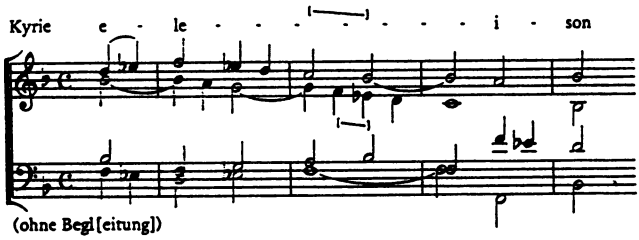



*Figure 5a. Leaping seventh: Brahms, Symphony IV, 4th mvmt, mm. 80ff.*

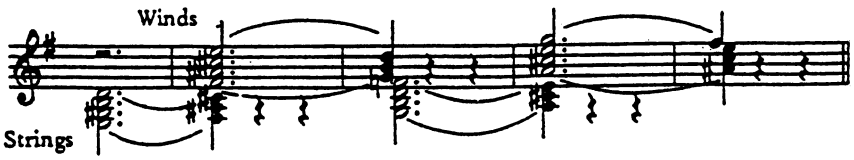



*Figure 5b. Schenker,* Kontrapunkt *1, Ex. 423.*

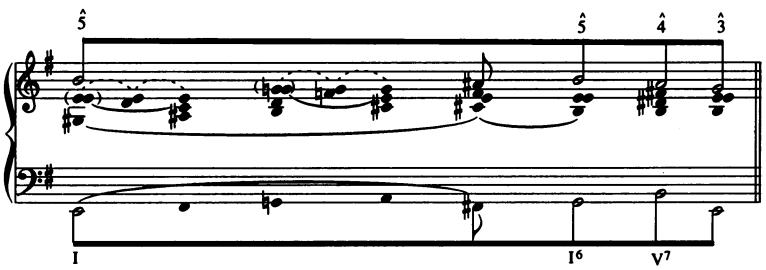
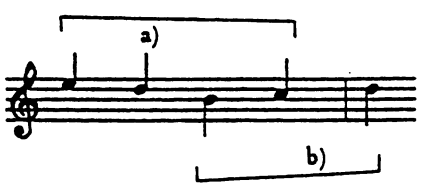



*Figure 5c. Cambiata: Schenker,* Kontrapunkt *I, Ex. 347.*



Schenker also used the laws of tonal voice leading to shed light on the behavior of harmonic progressions (see Figure 6b). In particular, he assumed that cadential closure is not simply a contrapuntal phenomenon, but is also dependent upon a progression from V to I. As for the other *Stufen*, Schenker believed that they arise from contrapuntal elaborations of these two fundamental harmonies. To quote him: "All the transient harmonies which appear in the course of a work have their source in the necessities of voice-leading."[24] Indeed, it was precisely because Schenker saw an intimate connection between line and chord that he did not restrict *Stufen* to tonic, subdominant, and dominant functions.[25]

[24]Schenker, *Der freie Satz*, § 84, p. 64; Oster trans., *Free Composition*, p. 35. In *Kontrapunkt I* Schenker emphasized the need for V–I progressions at points of closure: "In order to gain insight into cadences in free [tonal] composition it is important to recognize that there the closure is no longer based on the horizontal line alone but rather (and to a larger degree) on the harmony of the vertical [dimension], or, more precisely, on the succession from the V *Stufe* to I." Schenker, *Kontrapunkt* I, pp. 145–146; trans. John Rothgeb and Jürgen Thym., *Counterpoint* I, p. 105.

[25]Schenker's rejection of functionalism is discussed by Robert Wason, *Viennese Harmonic Theory from Albrechtsberger to Schenker and Schoenberg* (Ann Arbor: UMI, 1985), pp. 126–27; Matthew Brown, "A Rational Reconstruction of Schenkerian Theory" (Ph.D. diss., Cornell University, 1989), pp. 192–99; and Matthew Brown and Robert Wason, "Review of Heinrich Schenker, *Counterpoint*, trans. John Rothgeb and Jürgen Thym," *Music Theory Spectrum* 11/2 (1989): 232–39, esp. pp. 237–38. In response to my claim that, despite its success for explaining many tonal progressions, functional theory doesn't work for all tonal progressions, Eytan Agmon declares: "It is surely senseless to reject a theory outright merely because its success is limited, to one degree or another, in terms of the total domain under consideration." Unfortunately for Agmon, explanatory scope is one of the most important criteria for favoring one theory over another; when comparing two rival theories, it is completely rational to pick the one whose scope is wider and irrational to pick the one whose scope is narrower, other things being equal. See Eytan Agmon, "Functional Harmony Revisited: A Prototype-Theoretic Approach," *Music Theory Spectrum* 17/2 (1995), pp. 204–205.

*Figure 6a. Laws of Harmonic Classification.*

| Textbook Theory | | Schenkerian Theory |
|---|---|---|
| If a passage is tonal, then it is essentially built from major, minor, diminished, or augmented triads, and seventh chords on seven degrees. | LM | If a passage is tonal, then it is essentially built from major, minor, or diminished triads on seven degrees. |
| If a harmonic progression is tonal, then these seven degrees serve one of three functions—tonic (T), pre-dominant (P), or dominant (D) (functional equivalence). | LM | If a harmonic progression is tonal, then these seven degrees are not restricted to three functions. |
| If a triad appears, then it always has the root and the third, with any member in the bass (inversional equivalence). | LS | If a triad appears, then it must have the root and third, with only these members in the bass. |
| If the triad doubles notes, then it normally doubles the root, then the fifth, then the third, but not $\hat{7}$. | LS | If the triad doubles notes, then it normally doubles the root, then the fifth, then the third, but not $\hat{7}$. |
| If non-harmonic tones appear, then they always arise from seventh chords or motion between triads. | LS | If non-harmonic tones appear, then they arise from motion between harmonic tones of contrapuntal voices. |

*Figure 6b. Laws of Harmonic Progression.*

| Textbook Theory | | Schenkerian Theory |
|---|---|---|
| If a harmonic progression is tonal, then the triads are arranged as T–P–D–T. | GM | If a tonal progression is maximally closed, then it moves from V to I. |
| | S | If another essential harmony occurs, then it does so from motion between I and V. |

*Figure 6c. Laws of Chromatic Generation.*

| Textbook Theory | | Schenkerian Theory |
|---|---|---|
| If a harmonic progression is tonal, then it is essentially diatonic. | LM | If a harmonic progression is tonal, then it is essentially diatonic. |
| If chromaticisms occur, then they substitute for or elaborate diatonic triads. | LS | If chromaticisms occur, then they arise from mixture or tonicization. |
| | LS | If *Stufen* appear on #IV/bV, then they are only indirectly related to I |

*Figure 7a. Schenker's* Ursätze*:* Der freie Satz, *Figs. 9–11.*

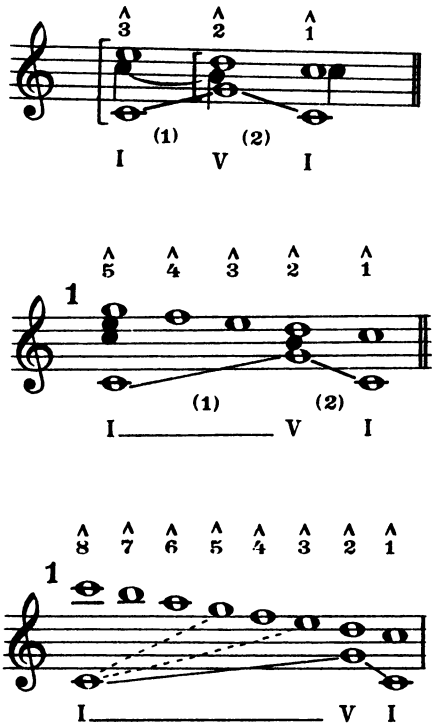


*Figure 7b. Main laws of tonal voice leading and harmony.*

| | | |
|---|---|---|
| **Melodic Motion:** | GM<br><br>LM | If a melody is maximally closed, then it begins on $\hat{8}$, $\hat{5}$, or $\hat{3}$, and ends $\hat{2}$–$\hat{1}$. If a melody establishes a single tonality, then it essentially moves by step. |
| **Relative Motion:** | GM<br><br><br><br>LM | If the texture is maximally closed, then the voices begin on $\hat{8}$, $\hat{5}$, or $\hat{3}$. The "alto" ends $\hat{7}$–$\hat{1}$, the bass $\hat{5}$–$\hat{1}$, and the "tenor" by step onto $\hat{3}$ or $\hat{1}$. If the voice leading is tonal, then the soprano and bass essentially move in contrary motion with each other |
| **Vertical Spacing:** | GM<br><br>LM | If the voice leading is tonal, then it begins/ends on tones of the tonic triad. If the voice leading is tonal, then it is essentially triadic. |
| **Harmonic Classification:** | LM | If a passage is tonal, then it is essentially built from major, minor, or diminished triads on seven degrees. |
| **Harmonic Progression:** | GM | If a tonal progression is maximally closed, then it moves from V to I. |
| **Chromatic Generation:** | LM | If a harmonic progression is tonal, then it is essentially diatonic. |

Lastly, Schenker realized that voice leading constrains chromaticism in tonal contexts (see Figure 6c). Whereas strict counterpoint is primarily diatonic and avoids direct chromatic successions, tonal composition uses mixture and tonicization to create a wide range of chromaticisms.[26] Although these chromatic successions can sometimes be direct, Schenker suggested that they are often avoided by motion from an inner voice, neighbor motions, linear progressions, and so on.[27] This point fits in nicely with "The ♯IV/♭V Hypothesis." As Douglas Dempster, Dave Headlam, and I have shown, Schenkerian theory implies that *Stufen* on ♯IV/♭V cannot be directly related to I; such successions inevitably contain direct chromatic successions either between $\hat{1}$ and $\sharp\hat{1}$ or between $\hat{5}$ and $\flat\hat{5}$.[28]

If Schenker's only contribution to music theory had been to formulate a set of general laws of voice leading and harmony for tonal music, then his place in music history would have been assured. After all, Fux's laws and the textbook laws of tonal harmony are still widely taught to this day. But Schenker also took the more radical step of expressing these laws as *Ursätze*, transformations, and levels. Consider, for example, the three forms for C major given in Figure 7. Each *Ursatz* satisfies the main laws of tonal voice leading and harmony in an optimally compact way. The *Urlinien* primarily move by step from $\hat{8}$, $\hat{5}$, or $\hat{3}$ through $\hat{2}$ to $\hat{1}$; the outer voices mostly move in contrary motion and are framed by members of the tonic triad; the underlying harmonic motion ends V to I and is diatonic in nature.

Whereas Schenker's *Ursätze* summarize the main laws of tonal voice leading and harmony, Schenker's transformations embody the various subordinate laws. Take, for example, the laws of

[26]For Schenker's discussion of direct chromatic successions, see Schenker, *Kontrapunkt* I, p. 68*ff.*; trans. John Rothgeb and Jürgen Thym., *Counterpoint* I, p. 46*ff.*

[27]Schenker, *Der freie Satz*, §§ 233, 249, pp.135, 147–148; Ernst Oster trans., *Free Composition*, pp. 83, 91–92, etc.

[28]Matthew Brown, Dave Headlam, and Douglas Dempster, "The ♯IV/♭V Hypothesis: Testing the Limits of Schenker's Theory of Tonality," *Music Theory Spectrum* 19/2 (1997): 155–183.

melodic motion (Figure 3a). Although tonal melodies primarily move by step, leaps can arise when the melody shifts from one harmonic tone to another or one polyphonic voice to another. Figure 8 lists several Schenkerian transformations that explain these processes. For example, register transfer and arpeggiation create leaps by moving from one harmonic tone to another (see Figures 8a–b), whereas unfolding, voice exchange, motion from an inner voice, and reaching over, generate leaps by moving from one contrapuntal voice to another (see Figures 8c–f). As it

*Figure 8a. Law of Melodic Motion.*

| | | |
|---|---|---|
| **Law of Melodic Motion:** | If leaps occur, then they do so when the melody shifts from one harmonic tone to another, or from one contrapuntal voice to another. | **LS** |

*Figure 8b. Registral transfer (*Hohelegung, Tieferlegung*):*
Der freie Satz, *§§ 147–54, 238–41, Figs. 47–9, 106–8.*

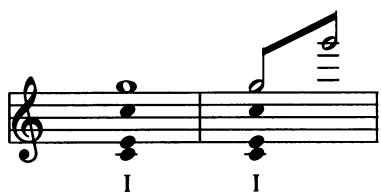



*Figure 8c. Arpeggiation* (Brechung):
Der freie Satz, *§§ 125–28, 230, Figs. 40, 100.*

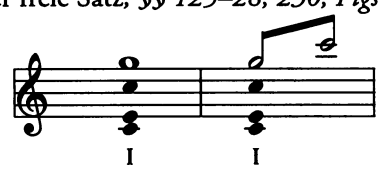


*Figure 8d. Unfolding* (Ausfaltung):
Der freie Satz, *§§ 140–44, 234, Figs. 43–5, 103.*

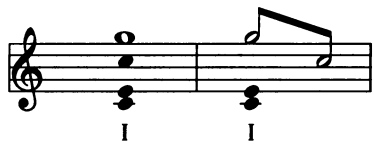



*Figure 8e. Voice exchange* (Stimmentausch):
Der freie Satz, *§§ 236–37.*

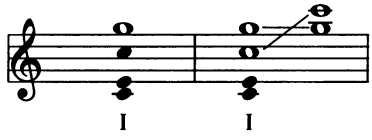



*Figure 8f. Motion from an inner voice* (Untergreifen):
Der freie Satz, *§§ 135–39, 233, Figs. 42, 102.*

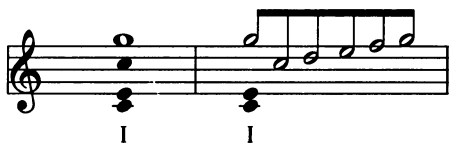
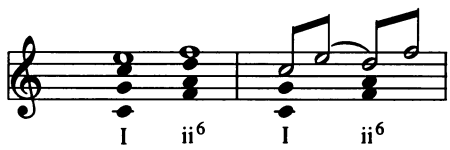



*Figure 8g. Reaching over* (Übergreifen):
Der freie Satz, *§§ 129–34, 231–32, Figs. 41, 101.*



happens, this list accounts for all the ways in which a single line can be created from two polyphonic voices.[29]

Finally, some of Schenker's laws are embodied in the ways in which transformations are ordered and grouped to create discrete levels. In fact, Schenker assumed that whenever a prototype is transformed, the resulting material will always conform to the same laws as the prototype itself. This idea of preserving laws through transformation is known in mathematics as *recursion* and it is conveyed by Schenker's famous motto "*semper idem sed non eodem modo*."[30] In fact, this motto has many implications. For example, since Schenker believed that parallel perfect octaves and fifths cannot occur between successive harmonic tones, he disallowed the deep middleground progression I–VI–V–I, which creates parallel perfect fifths $\hat{3}$/VI–$\hat{2}$/V.[31] But, as Schenker soon learned, it is very hard to preserve every law recursively from one level to another; even he conceded that parallels can arise at the middleground and that it is "the task of the foreground to eliminate them."[32]

But why is recursion such an important idea? The answer is that recursive processes can be found everywhere in the world around us—from the structure of computer programs to the genetic principles governing life itself.[33] Recursive models provide us with a way of understanding extremely complex structures through the use of simple principles; as such, they tell us something very powerful about the workings of the human mind, especially about how it processes knowledge. Schenker

[29]For an extensive discussion of this point, see Brown, "A Rational Reconstruction," pp. 128–129.

[30]Schenker, *Der freie Satz*, Chapter 1, Section 3, p. 19; Oster trans. *Free Composition*, pp. 5–6. Schenker used this motto starting with vol. 1 of *Der Tonwille* (1921) and in each part of *Kontrapunkt* II.

[31]Schenker, *Der freie Satz*, §§ 186–187, pp. 112–113; Oster trans., *Free Composition*, pp. 68–69.

[32]Schenker, *Der freie Satz*, § 161, p. 93; Oster trans., *Free Composition*, p. 56.

[33]See, for example, William Poundstone, *The Recursive Universe. Cosmic Complexity and the Limits of Scientific Knowledge* (New York: William Morrow, 1985).

himself recognized the need to uncover the simplicity that lies behind surface complexity. According to him, "It is an inevitable principle that all complexity and diversity arise from a single simple element rooted in the consciousness or the intuition."[34] In this respect, Schenker's goals were not really so different from those of scholars working in other empirical disciplines; indeed, just as Darwin set out to explain the diversity of life through a few fundamental principles, so Schenker set out to explain "a diversity in essential nature among the masters" through a small number of "identical laws."[35]

Figure 9 sums up the story so far. Figure 9a refers to traditional laws of strict counterpoint and functional harmony. Figure 9b suggests that, by linking the laws of tonal voice leading to the laws of tonal harmony, Schenker was able to modify both. Figure 9c then shows that he expressed these new laws recursively as an *Ursatz*, transformations, and levels. Significantly, these three stages mirror the path Schenker actually took in developing his theory; he started by revising traditional laws of tonal voice leading and harmony well before World War I; he did not formulate these laws recursively, however, until the 1920s. And it was only with the publication of *Der freie Satz* in 1935 that he was able to present a comprehensive version of that theory.

## 2. How can we confirm Schenker's interpretation of the *Ursatz*?

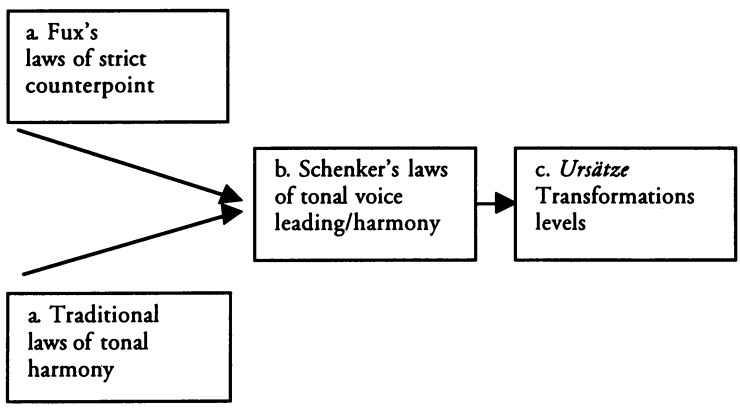
Having explained how I understand *Ursätze* and the forms they take, we can now turn to the issue of confirmation. Given that Schenkerian theory is an empirically testable theory of functional monotonality, it seems reasonable to consider how we might actually go about deciding whether or not it is well-

[34]Schenker, *Der freie Satz*, § 29, p. 41; Ernst Oster trans., *Free Composition*, p. 19.

[35]According to Schenker, "the fact that all of the masterworks manifest identical laws of coherence in no way precludes a diversity in essential nature among the masters." Schenker, *Der freie Satz*, p. 22; Ernst Oster trans., *Free Composition*, Appendix 4.H, p. 160.

confirmed. How, in fact, can we test Schenker's claim that all complete continuous monotonal pieces are derivable from an *Ursatz*? Besides clarifying the nature of Schenker's *Ursätze*, Figure 9 also sheds light on this specific issue. In particular, it allows us to subdivide the issue into two distinct claims: Claim 1—the laws given in Figures 3 and 6 are empirically adequate for explaining the behavior of tonal voice leading and harmony; and Claim 2—expert tonal composers actually internalize these laws recursively as Schenker suggested. Let us now see how we might set about verifying both of these claims empirically.

*Figure 9. Summary.*




Perhaps the most obvious way to confirm Claims 1 and 2 is by looking at lots and lots of pieces. This was essentially the strategy Schenker took in his *Neue musikalischen Theorien und Phantasien*; during this course of his monumental treatise, he examined hundreds of pieces from the common-practice Period. What is less obvious, however, is that he did so in a way that conforms to the broad outlines of "The Hypothetico-Deductive Method" (see Figure 10).[36] Although this model may not give a completely

[36]For brief discussions of the pros and cons of "The Hypothetico-Deductive Method," see John Losee, *A Historical Introduction to the Philosophy of Science*, 3rd ed. (Oxford: Oxford University Press, 1993), p. 158*ff* and

adequate account of scientific confirmation, it does capture many aspects of how working scientists create and test new laws or theories.[37] Scientists begin by observing the behavior of some well-defined test sample. Next, they guess some general laws that seem to explain these observations. They then deduce some consequences that are implied if the laws or theories are correct. Finally, they see if the prediction is true. If it is, then scientists will keep on using their laws or theories; if, however, the predictions are wrong, then they must either modify the laws or theories or replace them entirely. This, of course, was precisely Schenker's *modus operandi*. In the *Harmonielehre* and *Kontrapunkt* I–II he demonstrated not only how traditional laws of strict counterpoint and functional harmony don't always explain the behavior of quintessentially tonal music, but also how these laws can be transformed to overcome such deficiencies. In *Der freie Satz*, he showed how these laws can be used recursively. and how complete, continuous monotonal pieces can be derived from a given *Ursatz* using a finite set of transformations.

*Figure 10. The "Hypothetico-Deductive Method."*

a. Observe phenomenon in some well-defined test sample.
b. Guess law(s) to explain these observations.
c. Deduce some consequences that are implied if the law(s) is correct.
d. See if the prediction is sound. If it is, then keep using the new law(s). If it isn't, the modify them or replace with some new law(s) and start procedure over.

Significantly, Schenker was fully aware of the vital role prediction plays in building and testing music theories. He made this point perfectly clear near the start of *Kontrapunkt* I:

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William Bechtel, *Philosophy of Science. An Overview for Cognitive Science* (Hillsdale, N.J.: Erlbaum, 1988), p. 22*ff.*

[37]Richard Feynman, *The Character of Physical Law* (New York: The Modern Library, 1994), p. 150*ff.*

> In this study, the beginning artist learns that tones, organized in such and such a way, produce one particular effect and none other, whether he wishes it or not. One can predict this effect: it *must* follow. Thus tones cannot produce any desired effect just because of the wish of the individual who sets them, for nobody has the power over tones in the sense that he is able to demand from them something contrary to their nature.[38]

Schenker added, "Even tones must do what they do." He even tried to show that pieces by Reger, Stravinsky, and others in some sense deviate from these principles, thereby obscuring our sense of tonality.

Once we realize that Schenker's strategy follows "The Hypothetico-Deductive Method," then we can dismiss Eugene Narmour's charge that it commits the fallacy of affirming the consequent. According to Narmour, Schenkerian theory claims that all tonal compositions can be generated from various *Ursätze*, but in order to reduce a piece to one or other of these fundamental progressions, the analyst must know the identity of these *Ursätze* in advance.[39] In other words, Schenkerian analyses are self-confirming and therefore specious. The preceding account avoids this problem: it claims that, since Schenker's *Ursätze* can be deduced from certain fundamental laws of tonal voice leading and harmony, the three basic forms can be confirmed empirically without the aid of graphing. In fact, they are indirectly supported every time we confirm the laws of tonal voice leading and harmony. Seen in this light, Schenker's analyses provide us with support, not for the nature of *Ursätze*, but rather for the claim that *Ursätze*, transformations, and levels are adequate for explaining the behavior of complete, continuous monotonal pieces.

Although Schenker supported his theory with detailed studies of finished tonal compositions, we are still left to wonder whether his claims about the behavior of tonal lines and tonal harmonies are psychologically real. Does Schenkerian theory really provide

[38]Schenker, *Kontrapunkt* I, p. 21; Rothgeb and Thym trans., *Counterpoint* I, p. 14.

[39]Eugene Narmour, *Beyond Schenkerism* (Chicago: University of Chicago Press, 1977).

us with a plausible account of how expert composers actually think about their music? In fact, Claims 1 and 2 have quite different cognitive implications. Since the former concerns the immediate behavior of tonal lines and chords, it seems amenable to direct psychological tests of ordinary listeners; since the latter makes claims about the nature of musical expertise, it seems to demand detailed studies of highly-trained musicians.

Music psychologists have, in fact, confirmed many aspects of Claim 1. With regards to the laws of melodic motion and closure, research by Carol Krumhansl, J. J. Bharucha, and others has shown that, in tonal contexts, listeners do indeed treat pitches of the tonic triad as more stable than others, and that unstable tones generally move by step onto stable or "anchored tones."[40] They have also shown that stable tones are perceived to be more closely related to each other than unstable tones, and that unstable tones are perceived to be more closely related to each other when the stable tone follows the unstable tone than vice versa.[41] Similarly, Rosner and Narmour have shown that $\hat{2}$–$\hat{1}$ does indeed produce strong melodic closure; they have not only confirmed that harmonic progressions are maximally closed when they move from V to I, but they have also raised doubts about restricting tonal harmonies to just three basic functions.[42] As for the diatonic basis of tonality, Krumhansl and Bharucha have stressed that, although diatonic tones are generally more stable than nondiatonic tones, a non-harmonic tone that is "nondiatonic but anchored is more stable that one that is diatonic but not anchored."[43] Krumhansl has even given support to "The ♯IV/♭V Hypothesis."[44]

[40]J. J. Bharucha, "Anchoring Effects in Music: The Resolution of Dissonance," *Cognitive Psychology* 16 (1984): 485–518.

[41]Carol Krumhansl, "The Psychological Representation of Musical Pitch in a Tonal Context," *Cognitive Psychology* 11 (1979),. 346–374.

[42]Burton S. Rosner and Eugene Narmour, "Harmonic Closure: Music Theory and Perception," *Music Perception* 9/4 (1992), pp. 407–8.

[43]Bharucha, "Anchoring Effects in Music," p. 507.

[44]According to Krumhansl, listeners do indeed hear a disjunction when two triads a tritone apart are presented successively or simultaneously. Carol

The notion that expert composers rely on prototypes has likewise attracted considerable attention from music psychologists. John Sloboda, for example, has amassed considerable data to show that global prototypes play a crucial role in composing large-scale tonal music.[45] This evidence is drawn from archival studies of composers' workings and personal testimonies, as well as from direct observation of living composers working at their desks or improvising at the keyboard. While Sloboda concedes that these prototypes can alter "in light of the way a particular passage "turns out," he insists that the evidence for prototypes is overwhelming. Without them, it is hard to explain how expert composers can produce large quantities of music very quickly, how they can recall several pieces at once, and how they can compose pieces out of order.[46] Meanwhile, Mary Louise Serafine has confirmed that the capacity to perceive prototypes increases with experience.[47] Her experiments with short, unaccompanied melodies reveal that "simple underlying structures were accessible to subjects at age 8 and above, but examples of the more complicated structures involved in harmony and compound melody yielded equivocal findings."[48]

To sum up, Figure 9 shows that the process of confirming Schenkerian theory is far more complex than we might initially suppose. It involves studying the basic laws of tonal voice leading and harmony, as well as graphing large-scale pieces from the common-practice Period. From a cognitive perspective Figure 9 is especially interesting because it shows a connection between ordinary listening (Figure 9b) and expert composition (Figure 9c). This connection is important because many researchers draw unnecessarily sharp distinctions between ordinary and expert behavior, and between listening and composing. The fact is that

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Krumhansl, *Cognitive Foundations of Musical Pitch* (New York: Oxford University Press, 1990), p. 236.

[45]John A. Sloboda, *The Musical Mind. The Cognitive Psychology of Music* (Oxford: Oxford University Press, 1985), p. 102*ff*, esp. pp. 116–119.

[46]*Ibid.*, p. 116.

[47]Mary Louise Serafine, *Music as Cognition* (New York: Columbia University Press, 1988), pp. 213–222.

[48]*Ibid.*, p. 222.

expert musicians start life as ordinary people; just because they develop extraordinary skills, there is no reason to suppose that their musico-cognitive processes are completely novel. Furthermore, although ordinary listeners are unable to comprehend every feature of musical expertise, they can still appreciate some aspects; if not, then it is hard to understand why they are able to recognize and value exceptional feats of musicianship.

### 3. What's wrong with Neumeyer's arguments and Rothstein's Paradox?

Having considered the significance and testability of Schenkerian *Ursätze*, we can now reply in detail to Neumeyer and Cohn. As mentioned earlier, Neumeyer's response to Rothstein's Paradox is to claim that we should either abandon the *Ursatz* or abandon the notion that Schenker's method constitutes a theory.[49] There seem to be two sources for this claim. On the one hand, Neumeyer clearly believes that Schenker's list of *Ursatz* forms is inadequate for explaining all complete, continuous monotonal pieces. For example, he has proposed adding other forms of *Urlinie*, including the rising line $\hat{5}-\hat{6}-\hat{7}-\hat{8}$ and has suggested that $\hat{8}$ lines properly belong to the middleground not the background.[50] These options are listed in Figure 11.[51] On the other hand, Neumeyer is dissatisfied with what he sees as Lerdahl and Jackendoff's attempts to ground Schenkerian theory in the rigorous methods of science. To quote him:

> It is ironic—but to the point here—that the one adaptation of Schenker which can claim some grounding in scientific models, Lerdahl and Jackendoff's

[49]Neumeyer and Hook, "Review: Analysis of Tonal Music," p. 219.

[50]David Neumeyer, "The *Urlinie* from $\hat{8}$ as a Middleground Phenomenon," *In Theory Only* 9 (1987): 3–25; "The Ascending *Urlinie*," Journal of Music Theory 31 (1988): 271–303.

[51]In part, these stem from the work of Schenker's pupil, Felix-Eberhard von Cube; see Susan Tepping, "An Interview with Felix-Eberhard von Cube," *Indiana Theory Review* 6 (1982–83): 77–103.

prolongational reduction, has achieved no success at all, to judge from adoption of its methods in the literature (outside of Lerdahl himself).[52]

He continues, "the care of its grounding and the logic of its method are matched only by its aridity as an interpretive practice."[53]

The first drawback with Neumeyer's argument is that it seems to treat *Ursätze* as directly audible phenomena rather than abstract prototypes of the sort proposed by Schenker or Goethe. As a result, the alternate *Ursätze* given in Figure 11 do not conform to the local and global laws summarized in Figures 3 and 6. For example, his rising *Urlinien* contradict the law that melodies reach maximum closure when they descend $\hat{3}-\hat{2}-\hat{1}$. Since $\hat{8}$ lines do indeed satisfy Schenker's main laws of tonal voice leading, it is hard to see why they can be dismissed as Neumeyer suggests. The danger with Neumeyer's position is that unless we ground the *Ursatz*, transformations, and levels in general laws of tonal voice leading and harmony we cannot guarantee Claim 2. After all, these laws tell us what the prototypes are, what transformations are possible, and in what order they can operate. The real irony here is that in his criticisms of *Ursätze*, Neumeyer completely underestimates the meta-theoretical significance of Schenker's work; as a result he threatens to give up the notion of recursion.

A second shortcoming with Neumeyer's position is that Lerdahl and Jackendoff do not really try to adapt Schenkerian theory to scientific models. On the contrary, they not only insist that their goals are quite different from Schenker's, but they explicitly confine their research to listener, rather than composer, psychology. As Lerdahl and Jackendoff point out, Schenker's orientation was essentially artistic in nature; his goal was "to illuminate structure in musical masterpieces."[54] Their purpose, meanwhile, was primarily psychological: they try to offer "*a formal description of the musical intuitions of a listener who is*

[52]Neumeyer and Hook, "Review: Analysis of Tonal Music," pp. 220–21.

[53]*Ibid.*, p. 221.

[54]Fred Lerdahl and Ray Jackendoff, *A Generative Theory of Tonal Music* (Cambridge: MIT Press, 1983), pp. 337–338.

*experienced in a musical idiom.*"[55] To verify Schenker's *Ursätze* empirically, we cannot confine ourselves to studying how ordinary people listen to music, we must also consider the cognitive processes guiding expert tonal composition. As we have seen, Sloboda and others have suggested several ways in which we might study the latter empirically.

*Figure 11. Neumeyer's list of alternative* Ursätze.

Group 1 (Incomplete forms, except for $\hat{3}-\hat{2}-\hat{1}$):
$\hat{8}$———$\hat{8}$
$\hat{5}$———$\hat{5}$
$\hat{3}$———$\hat{3}$
* $\hat{3}-\hat{2}-\hat{1}$
$\hat{8}-\hat{7}-\hat{8}$ (or $\hat{8}$—9—$\hat{8}$?)
$\hat{5}-\hat{6}-\hat{5}$ (or $\hat{5}$—$\hat{4}$—$\hat{5}$?)
$\hat{3}-\hat{4}-\hat{3}$ (or $\hat{3}$—$\hat{2}$—$\hat{3}$?)
$\hat{5}-\hat{4}-\hat{3}$

Group 2 (Background forms):
* $\hat{3}-\hat{2}-\hat{1}$
$\hat{5}-\hat{4}-\hat{3}-\hat{2}-\hat{1}$
$\hat{5}-\hat{6}-\hat{7}-\hat{8}$

Group 3 (Forms from previous groups with first middleground elaborations):
$\hat{3}-\hat{4}-\hat{3}-\hat{2}-\hat{1}$
$\hat{5}-\hat{6}-\hat{5}-\hat{4}-\hat{3}-\hat{2}-\hat{1}$
$\hat{8}-\hat{7}-\hat{6}-\hat{5}-\hat{4}-\hat{3}-\hat{2}-\hat{1}$
$\hat{3}-\hat{2}$ // $\hat{3}-\hat{2}-1$
$\hat{5}-\hat{4}-\hat{3}-\hat{2}$ // $\hat{3}-\hat{2}-\hat{1}$
$\hat{5}-\hat{4}-\hat{3}-\hat{2}$ // $\hat{5}-\hat{4}-\hat{3}-\hat{2}-\hat{1}$
$\hat{3}-\hat{4}-\hat{3}-\hat{2}$ // $\hat{3}-\hat{2}-\hat{1}$
$\hat{8}-\hat{7}-\hat{6}-\hat{5}$ // $\hat{5}-\hat{4}-\hat{3}-\hat{2}-\hat{1}$
(or $\hat{8}-\hat{7}-\hat{6}-\hat{5}$ // $\hat{8}-\hat{7}-\hat{6}-\hat{5}-\hat{4}-\hat{3}-\hat{2}-\hat{1}$)
$\hat{5}-\hat{4}-\hat{3}-\hat{2}$ // $\hat{5}-\hat{6}-\hat{7}-\hat{8}$
$\hat{8}-\hat{7}-\hat{6}-\hat{5}-\hat{4}-\hat{3}-\hat{2}$ // $\hat{8}-\hat{7}-\hat{6}-\hat{5}-\hat{4}-\hat{3}-\hat{2}-\hat{1}$

[55] *Ibid.*, p. 5.

There seems to be a third problem with Neumeyer's comments. When Neumeyer contrasts the precision of Lerdahl and Jackendoff's theory with the aridity of their interpretations, he seems to imply that there is an inherent conflict between scientific explanation and aesthetic understanding. Such a view is, of course, familiar enough and surfaces in many places and many guises. Yet it is a view that doesn't stand up to very close scrutiny. Although scientific research is primarily motivated by concerns for empiric adequacy, internal consistency, and inter-subjective testability, it is also guided by aesthetic concerns, such as a desire for elegance, simplicity, and the like.[56] Deciding between theories can, in fact, be regarded as a process of balancing these different epistemic values. Having said this, scientists do promote some values over others. For example, they seem to value consistency over simplicity and coherence. Consistency guarantees that claims can be tested inter-subjectively; and inter-subjective testability is one of the hallmarks of rational discourse. Simplicity, meanwhile, is an advantage in application, but it is ultimately much better for a theory to be complex and consistent than simple and inconsistent.

Just as there is nothing intrinsically unscientific about Schenkerian *Ursätze*, so there is no reason to pick between accepting multiple hierarchies or accepting that Schenker's first priority was cultural ideology. To see why this is so, it is useful to reconsider Figure 9. Among other things, Figure 9 shows that Schenkerian theory is first, and foremost, a theory of tonality and not a theory of musical structure *per se*. The point is important because it emphasizes that, insofar as explanations require laws, Schenkerian theory is capable of explaining only the contrapuntal and harmonic structure of tonal music.[57] This is not to say, of course, that Schenkerian analyses have nothing significant to say

[56]For a discussion of these and other epistemic values, see W. V. Quine and J. S. Ullian, *The Web of Belief*, 2nd ed. (New York: McGraw-Hill, 1978) and Thomas Kuhn in his essay, "Objectivity, Value Judgment, and Theory Choice," in *The Essential Tension* (Chicago: University of Chicago Press, 1977): 320–339.

[57]For a discussion of the role laws play in explanation, see Matthew Brown and Douglas J. Dempster, "The Scientific Image of Music Theory," *Journal of Music Theory* 33 (1989): 65–106.

about the motivic, rhythmic, or formal properties of a given piece. Clearly, they do. Rather, it means that, until we formulate general laws that cover the behavior of tonal motives, tonal rhythms, and tonal forms we can only describe these things, we cannot explain them except as tonal phenomena. Since we know that motives, rhythms, and forms, are not simply tonal phenomena and since they may well be structured at different levels, there is every reason to accept the possibility of multiple hierarchies.

Figure 9 also underscores the fact that Schenker's theory of tonality is designed to explain the behavior of music associated with a particular culture and time period, namely Western art music of the common-practice Period. Although Schenker often claimed that *Ursätze* compose out "The Chord of Nature," he was very much aware of the fact that the music of other cultures is organized in other ways. Once we relate Schenker's *Ursätze* to the certain laws of voice leading and harmony, there is no reason to doubt that they are cultural categories. However, it is an open question whether the cognitive processes that allow experts to manipulate these laws recursively are culturally dependent; on the contrary, there is strong evidence to suggest that such processes are indeed cross-cultural.

As for Cohn's notion of separating Schenker's analytical methods from their main theoretical tenets, we should proceed very cautiously. Certainly, no one would deny that Schenker produced many remarkable analyses and that they often seem superior to rival interpretations. Nevertheless, there are numerous contradictions between Schenker's analytical methods and his theoretical claims. Indeed, as Cohn rightly notes, Schenker went too far in claiming that the *Ursatz* was the sole source of unity in monotonal pieces of the Common-Practice Period.[58] Obviously,

[58]I'm not really sure that we should regard the claim that "The *Ursatz* alone is the sole source of compositional unity" as a main tenet of Schenkerian theory. On some occasions Schenker certainly made comments to this effect, but on other occasions he was modest in claiming that *Ursätze* encapsulate the underlying principles of tonal motion. This latter theme is especially prominent in Schenker's *Harmonielehre* and *Kontapunkt* I–II.

motivic, formal, and rhythmic factors play vital roles in unifying musical compositions and, as mentioned earlier, they can often function quite independently of tonal voice leading and harmony.

But once we concede that *Ursätze* only explain the tonal unity of certain monotonal compositions, then many of Cohn's points loose force. I, for one, part company with Cohn when he suggests that "it is not difficult to see how Schenkerian analysis might thrive in isolation from basic principles" and that "we need to give very serious consideration to Nicholas Cook's proposal that Schenkerian theory, and music theories in general, should aim toward the suggestiveness of strong metaphors, rather than any more ultimate claims about truth or reality."[59] Although we should be suspicious of ultimate claims about truth or reality, the only way in which we can determine whether or not an analysis is successful is to see if it is consistent with some set of underlying theoretical principles and if it somehow fits with the piece in question. How, for example, can we possibly understand Schenker's use of implied tones in Figures 2a–b, if we don't invoke some basic principles of tonal voice leading and harmony? And, how can Cook possibly decide that some metaphors are strong unless he makes some appeal to what really happens in the piece? Scientific knowledge may be fallible and "The Hypothetico-Deductive Method" may not lead to certainty, but music theorists should not give up the notions of truth and reality altogether. Unlike Cohn, I see absolutely no reason why we should take Cook's proposal seriously or why we should expect Schenkerian analysis to thrive in isolation from its theoretical principles.

If it is hard to sever Schenker's analytical methods from their theoretical underpinnings, then why is it so much easier to separate Schenker's theories from his *Weltanschauung*? The answer to this question is simple; the empiric consequences of these two moves are completely different. Whereas eliminating crucial theoretical concepts, such as the *Ursatz*, severely restricts the explanatory scope and predictive power of Schenkerian theory,

[59]Cohn, "The Autonomy of Motives," p. 170.

ignoring Schenker's world view does not have anything like the same results. For example, Schenker's nationalism has no bearing on the empiric testability of his theory; on the contrary, there is plenty of evidence to show that his concepts can be used to explain the behavior of music by composers who were not Austro-German by birth. Similarly, the explanatory power of Schenkerian theory is not diminished if we reject Schenker's appeals to "The Mysterious Five" in his generation of the major system; although magic numbers may be interesting historical curiosities, they are best left to Mulder and Scully or to the Blair Schenker Project, than to serious discussions in music theory.[60] In this respect, music theory is no different from many other disciplines; after all, physicists have no problem separating Newton's amazing contributions to science from his peculiar fascination with alchemy.[61]

Since Neumeyer's views about Schenkerian theory were prompted in large part by Rothstein's Paradox, let me conclude by using Figure 9 to suggest some ways to teach beginners about the nature of Schenker's *Ursätze*. It was clear from Figure 9 that Schenkerian theory requires us to transform the traditional laws of strict counterpoint and functional harmony so that they interact in a mutually dependent way, and to reformulate these new laws of tonal voice leading and harmony recursively as an *Ursatz*, transformations, and levels.

This last observation gives us a simple pedagogical plan for presenting Schenker's ideas in the classroom. Obviously, the teacher must begin by reviewing the general laws of tonal voice leading and harmony and by showing them as transformations of the laws outlined by Fuxian strict counterpoint and traditional

[60]In response to my claims that Schenker's generation of the major system is based on *ad hoc* and arbitrary assumptions, Suzannah Clark notes that "In each of these cases, the factor Brown has missed is the Mysterious Five." Suzannah Clark, "Schenker's Mysterious Five," *Nineteenth-Century Music* 23/1 (1999), p. 87. I can only say that I stand by my original view; I ignored "The Mysterious Five" because it is, in my opinion, a ridiculous notion!

[61]For a brief discussion of Newton's views, see Emilio Segrè, *From Falling Bodies to Radio Waves. Classical Physicists and Their Discoveries* (New York: Freeman, 1984), pp. 70–71.

harmonic theory. Next, the teacher might explain how these laws can be reformulated recursively as *Ursätze*, transformations, and levels. This stage can be done theoretically, without immediately introducing complex pieces. Finally, the teacher might show how composers have traditionally learned to elaborate prototypes to produce ever more complex pieces. At this point, the student might learn to compose or improvise their own pieces from prototypical contrapuntal/harmonic models.

In a paper given at the Third International Schenker Conference, Panayotis Mavromatis provides an intriguing model of how this might be done.[62] He shows how fifteenth-century organists were taught to compose and improvise by learning to elaborate simple polyphonic prototypes, which are contained in the *fundamenta*. Later sixteenth-century Italian preludes draw on similar prototypes based on so-called *intonatione*. Mavromatis then demonstrates how these same prototypes can be found in much later preludes by composers such as Froberger and Pachelbel. This point confirms Schenker's observation that studying the fantasies, preludes, cadenzas, and embellishments of the expert composers should be a "high priority" for all music instruction.[63] Following Mavromatis's model, the student could then study some complete preludes, such as Bach's Twelve Short Preludes. These, of course, are pieces that Schenker sketched in *Der Tonwille* and *Das Meisterwerk in der Musik*.[64]

[62]Panayotis Mavromatis, "The Early Keyboard Prelude as an Agent in the Formation of Schenkerian Background Prototypes," Third International Schenker Conference, Mannes College of Music, March 12, 1999.

[63]Schenker, *Der freie Satz*, p. 22; Ernst Oster trans., *Free Composition*, p. 7. A couple of sentences earlier, Schenker noted, "The ability in which all creativity begins—the ability to compose extempore, to improvise fantasies and preludes—lies only in a feeling for the background, middleground, and foreground. Formerly such an ability was regarded as the hallmark of one truly gifted in composition, that which distinguished him from the amateur or the ungifted."

[64]For details, see Larry Laskowski, *Heinrich Schenker. An Annotated Index to his Analyses of Musical Works* (New York: Pendragon, 1978), pp. 22–24. Schenker also analyzed some preludes by Handel in his essay "Die Kunst der Improvisation," in *Das Meisterwerk in der Musik*, Vol. 1 (Munich: Drei Masken Verlag, 1925), 31–40; trans. Richard Kramer as "The Art of Counterpoint," in

All in all, Neumeyer's biggest fallacy is to have taken Rothstein's Paradox seriously in the first place. Although it may not be possible or even desirable to teach students every aspect of Schenker's work, it certainly does not follow that the *Ursatz* is the thing to jettison. Neumeyer's eagerness to take this latter step seems to follow from his narrow interpretation of what *Ursätze* are and how they can be verified empirically. The present reply has suggested that it is possible not only to defend Schenker's formulation on methodological grounds, but also to teach students about the intimate relationship between background and foreground. The costs of abandoning the *Ursatz* and of severing Schenker's analytical methods from his main theoretical tenets are enormous; they amount to giving up the first recursive theory of tonality. Although this theory may not be entirely successful, we have every reason to be optimistic that future generations will overcome the problems in Schenker's original version. If Schenkerians start to engage these broader methodological issues and start to join forces with scholars working in other fields, from cognitive science to historical musicology, there is every reason to suppose that their work can survive and even prosper in the years to come.

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William Drabkin ed., *The Masterpiece in Music* I (Cambridge: Cambridge University Press, 1994), pp. 13–19.