Analyzing Atonal Music: Pitch-Class Set Theory and Its Contexts

Michiel Schuijer. University of Rochester Press, 2008.

reviewed by
PHILIP EWELL

For some time now, pc set theory has been a cornerstone of music theory as practiced in the United States. For those who have spent the better parts of their careers invested in late-twentieth-century American music theory, it is hard, perhaps impossible, to view pc set theory in any unbiased fashion. Indeed, it would be difficult to find another theory that invokes a greater "love it or hate it" reaction among those versed in music analysis. Further, insofar as the American music theorist is almost always, out of necessity it would seem, directly influenced by a small group of key figures in pc set theory—Milton Babbitt and Allen Forte chief among them—and their disciples, that theorist will always be on the inside looking out, never able to gain a perspective that would allow for a deeper understanding of key concepts or a historical context that could explain some of the passionate debates surrounding pc set theory.

Herein lies the great advantage of Michiel Schuijer's *Analyzing Atonal Music*, a superb historical account of American pc set theory. First, Schuijer has the advantage of being a historical musicologist first and foremost, albeit one with an in-depth knowledge of twentieth-century music-theory topics. As such, he is free of the biases inherent in those holding advanced degrees specifically in music theory (which are almost always from North American institutions, since such degrees are rare in Europe and elsewhere). Thus, his work falls firmly within the field of the history of music theory and "aims to establish a new rapport between musicology and music theory" (xv). Second, and more important, he is a Dutchman trained in the Netherlands. This allows for a wonderfully unvarnished and incisive view of pc set theory, this bedrock of American music theory. Schuijer's unprejudiced and keen judgment is readily apparent when reading this book and, with all the blood that's been spilled on the topic of American pc set analysis, it is refreshing to finally have a book that takes no sides and tells it like it is. *Analyzing Atonal Music* is rigorous, well laid out, and extremely well documented; one can only stand in awe of its attention to detail. It is, in fact, a rewrite of Schuijer's 2005 dissertation.

Chapter 1, "Pitch-Class Set Theory: An Overture," begins with a fascinating recounting of the Fourth European Music Analysis Conference, held in 1999 in Rotterdam, Netherlands. At the beginning of the chapter, in a section entitled "A Tale of Two Continents" (1), Schuijer explains how a confrontation broke out at the conference over the relative merits of pc set theory when an American participant asked why no one had mentioned this theory for analyzing twentieth-century music and the chairman of the panel, a professor from the Sorbonne, responded, "we do not *talk* about pitch-class sets, because we do not *hear* them!" (2, italics original). It is a striking way to begin the book, showing how, in Europe, American pc set theory is certainly known but not followed, and that many Europeans simply do not accept the tenets upon which this theory is based. This is a wonderful example of the intrigue that Schuijer's European perspective adds to the narrative on pc set theory that he is creating.

Still in Chapter 1, through a few brief examples, Schuijer introduces the idea of the pc set, as well as the basic building blocks of this system, namely, octave and enharmonic equivalence of notes and transpositional and inversional equivalence of sets. Schuijer's definition of the pc set—"an abstract concept of a combination of musical tones" (7)—is worth pointing out. Of course, the standard definition of the pc set as understood in American music theory is an "unordered collection of pitch classes." His musicological definition, stressing the "abstract concept" of the essence of the pc set, is refreshing and useful in trying to reframe some of these concepts. Schuijer also includes a "Short Detour to Schenker" (13) that helps the reader to understand some of the broader issues in the field of American music theory in the latter part of the twentieth century, as well as how it became its own field as distinct from historical musicology. In the section on "Institutionalization and Criticism" (17), Schuijer discusses just how far flung pc set theory has become in the U.S., noting how it is now represented in nineteen of twenty representative undergraduate programs in the U.S. and Canada (Table 1.1, 19). He also discusses criticisms that have been leveled at pc set theory over the years, by authors such as Joseph Kerman (1985), Fred Lerdahl (1989), George Perle (1990), and Richard Taruskin (1979 and 1986), among others. Of course, Schuijer acknowledges the pioneering work of Milton Babbitt and Allen Forte in the field of pc set theory, and cites their work accordingly throughout the book.

In Chapters 2 through 6 of *Analyzing Atonal Music*, Schuijer focuses on "pitch-class set theory's conceptualization of musical structure" (27). Chapter 2, "Objects and Entities," provides a rigorous look at the concepts of pitch, pitch class, intervals, pc set, and the interval content of sets. Schuijer begins the chapter thus: "Pitch-class set theory is a musical application of mathematical set theory" (29). Again, I think we who have dealt with these topics, both inside and outside of the classroom, tend to forget such basic things about pc set theory sometimes, and it is nice to be reminded of them, alongside Schuijer's thorough narrative of the topic. Aided by mathematical formulae, Schuijer gives an in-depth historical account of the genesis of these terms. Notably, he points out how the "interval class," Allen Forte's term (Forte 1964, 140), is problematic: "It is questionable whether an inverse relation of PICs is really an equivalence relation.... Consequently, Forte's interval class is not a 'class' in the same sense as PCs and PICs are" (39).[1] Indeed, others have questioned this aspect of Forte's system, whether, for instance, C and E as a major third is the same as C and E as a minor sixth. On the one hand, they are the same two pitch classes, so they are, at least in this one sense, equivalent. On the other, they are inversionally related, and thus do not satisfy the condition of reflexivity or transitivity necessary for an equivalence relation.[2] Schuijer offers the term "absolute pitch interval class," or APIC, as a replacement for the interval class (40): this term, he suggests, could also more accurately depict Forte's "interval class vector" as the "APIC vector" (48); Schuijer therefore uses APIC throughout the book.[3]

Chapter 3, "Operations," Schuijer discusses the three main transformations from pc set theory—transposition, inversion, and multiplication—striking an admirable balance between history and theory. Of course, transposition and inversion are many centuries old, and he offers several views on these operations from authors such as Zarlino, Vincentino, Koch, Marpurg, Fux, and Rameau, among others. Schuijer then focuses on transposition in pc set analysis, invoking Babbitt's mathematical definition thereof (55) and Forte's expansion to include sets of cardinality less than twelve (57). After citing a musical example by Webern from Forte's *Structure of Atonal Music* (1973) in which a transpositional relation is made between a melodic segment and a subsequent chord (Example 3.3, 56), Schuijer makes what I consider to be a paramount point: "PC sets cannot convincingly be shown to function as transpositions of other PC sets without invoking criteria other than the transpositional relationship alone—criteria such as textural salience, the preservation of a melodic contour, or some significant number of such relationships" (59). All too often, in my opinion, such transpositional (and inversional and other) relationships are made in pc set theory as practiced in the U.S. based solely on set-class membership, neglecting other criteria as Schuijer suggests above, criteria that would only strengthen the case for pc set analysis. He goes on to discuss

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[1] Schuijer's PIC, or "pitch interval class," is usually called the "ordered pitch-class interval" in the United States (e.g., in Straus 2005).

[2] The three conditions for an equivalence relation—reflexivity, symmetry, and transitivity—are explained by Schuijer on pp. 29ff and by Forte in Forte 1964, 179n5.

[3] For a classification system that distinguishes between the inversional forms of a set class, see Pople 1989, 307–15 (Appendix II). In his system inversionally related pc sets—whose prime forms are "'left-packed' by a more elegant algorithm than Forte's procedure for finding the 'best normal order'" (307)—are members of two distinct set classes and are assigned Forte numbers with additional suffixes, "A" or "B." So, for example, Forte's set class 3–2, whose prime form is (013), is listed as two set classes in Pople's system: 3–2A (013) *and* 3–2B (023). Of course there is no need to make this distinction with inversionally symmetrical set classes, so Pople uses Forte's nomenclature for those sets, such as 3–1, prime form (012).

inversion and multiplication, a much newer concept in compositional practice, in much the same way he discusses transposition.

Schuijer deals with the concept of PC set equivalence in Chapter 4, "Equivalence." He begins with an in-depth look at the mathematical underpinnings of "equivalence" and "equality," and how these terms relate to pc set theory. In discussing how pc set theory grew out of twelve-tone theory, Schuijer provides an important historical link by using the "source set," Babbitt's term for that part of a twelve-tone row that combined to form aggregates (a combinatorial hexachord would be an example of such a source set):

> The 'source set' can be seen as providing the historical link between twelve-tone theory and PC set theory: observing that two sections of different series-forms contain exactly the same PCs comes close to stating that these sections represent different orderings imposed on one, unordered PC set. This shows how closely related the concepts of a PC set and a twelve-tone series actually are." (96)

Illuminating these important historical links, and tying them all together in one compelling story, is perhaps Schuijer's greatest contribution. In this chapter he also tackles the thorny issue of set-class membership. Acknowledging important contributions of those in Babbitt's circle—such as Randall, Martino, and Howe—Schuijer explains how the set class underwent many changes in the 1960s. He also discusses Forte's significant contributions to the naming of pc sets. This chapter also includes Schuijer's treatment of the history of the pc set, an important topic for this book (115–23).[4] He concludes the chapter by saying, "the concept of PC set equivalence embodies a view of musical coherence as independent from the limits of aural perception" (128). This is an important point not often made, that the pc set of pc set theory grew out of an abstraction (namely, the twelve-tone row). He is not saying that pc sets that are members of the same set class, for example, cannot be aurally perceived as such; he is saying, significantly, that aural perception was not at the basis of the system that arranged certain pc sets of the same cardinality into groups of equivalence classes.

Chapters 5 deals with the concept of "Similarity." The similarity of pc sets has to do with the relation of sets that are generally not considered to be "equivalent" under one of the definitions of equivalence offered in the previous chapter. Schuijer does hasten to add that the two terms, equivalence and similarity, are not mutually exclusive: one pair of sets can be both equivalent and similar. The main difference lies in the fact that equivalence relations are binary, while similarity relations are related by degree. That is, two elements, for example sets A and B, can be either equivalent or not equivalent but, with respect to similarity, they can be similar to a greater or lesser extent. Most of this chapter is devoted to the varying degrees of similarity among pc sets, and the authors

[4] A more complete history of the pc set is contained in Bernard 1997.

who wrote significant work thereon: Forte, Teitelbaum, Regener, Rahn, Morris, and Isaacson, among others. Also significant is Schuijer's discussion of the work of Hindemith and Krenek (138–44), two European figures who advanced the notion of "degrees of similarity" using the idea of "harmonic tension." Anyone who has dealt with similarity will want to read the remainder of the chapter, which gives a thorough account of the topic and the significant work that it has spawned.

Chapter 6, "Inclusion," the only chapter that did not appear in Schuijer's dissertation, is of great importance to pc set theory, insofar as through concepts of inclusion authors sought to use the tools of this theory to analyze larger works, such as entire sections or movements, by means of set analysis. Ultimately, it was Forte's "set complex," his most significant and unique contribution to the field of pc set theory, that allowed for such grandiose analyses (Forte 1964 and 1973). Schuijer says:

> Set-complex theory deals with the analysis of entire compositions, or movements and sections of compositions. More specifically, it deals with the question of how these can be unified in terms of PC sets….In other words, it should delineate a cross-cardinality "family" of PC sets. Such a relation is the *inclusion* relation. (179; italics original)

Schuijer discusses inclusion relations of tonal as well as atonal works. One example that sticks out in this discussion is Stravinsky's *Petrushka* (200–2). After acknowledging the seminal work of Berger (1963) and having pointed out and accepted the prevailing octatonic interpretation of the Petrushka chord—the chord and the octatonic are, after all, in an inclusion relationship—Schuijer makes a convincing case for the polytonal reading of this chord as well: "However, such a 'polytonal' interpretation can be meaningful in another respect. The C-major and F♯-major triads in the Petrushka chord owe their salience, not only to a particular musical articulation, but also, and maybe more so, to their referentiality" (201). Pc set theory comprises objects and entities: so we often speak of a pc set as the sum of its parts (set A, for example) *or* as an object comprised of its constituent elements (pcs a, b, c, etc., contained in set A, for example). Whether we examine the set or its elements depends on what we are trying to show. There is no correct way to view the situation. Wouldn't it be nice if we could view the Petrushka chord in these terms—as having worth both as a subset of the octatonic collection *and* as a six-note entity comprising two distinct major triads—rather than as the zero-sum game that is usually the case currently? Schuijer successfully strikes this enviable balance. He says, "Notwithstanding the inclusion of the Petrushka chord in an octatonic scale, its interpretation as a synthesis of two opposing poles is entirely rational, given the weight and the influence of the tonal tradition at the time of *Petrushka*'s composition. In turn, this interpretation has added hugely to its salience as an octatonic subset" (201).

Chapter 7, "'Blurring the Boundaries': Analysis, Performance, and History," is an incisive reflection on pc set theory's relation to music analysis and music history. In many ways, this chapter represents a defense of music analysis in the face of criticisms from figures such as Kerman, Tomlinson, Treitler, and Taruskin. Extensive reference is made to the work of the latter, and his disputes with Christensen (219–20) and Forte (225–27ff.). With characteristic clarity, Schuijer states a core element of pc set theory, and why some have problems with it:

> PC set theory considers a PC set as being the *essence* of a chord, a melody, or a motif, or any other music entity involving traditional pitches, so that when two such entities have their PC sets in common—or when their PC sets are of the same equivalence class—they are *equated*, by supplying them with identical labels.

He continues,

> PC set theory can thus be seen as dealing with a concept of unity based on *recurrence* and *variation*. Like Schenker's theory of tonal unity (a concept based on *prolongation*), it has transformed an aesthetic creed into a set of analytical tools. Not surprisingly, then, it has met with the same kind of criticism that was meted out to the Schenkerians. It was considered to be insensitive to musical experience, and ignorant of what may render a work unique. (222–23; italics original)

Schuijer speaks of a "professionalization of music analysis," as exemplified by pc set theory and Schenkerian theory, and how this professionalization was viewed as "degenerate" by some (223). However, he points out that "music analysis is essentially a matter of *signification*, that it gives meaning to an object" (223; italics mine). As such, anyone who engages in music analysis, including the music historian, is signifying a musical composition, which puts the historian and the theorist into the same camp, for better or worse. Schuijer also discusses segmentation in this chapter (228–230), a most important element of pc set theory. In fact, many of the important issues surrounding pc set theory—from its interaction with analysis, history, and criticism to its interpretation as an "act" or a "performance"—are tackled in this chapter, and many of the relevant texts are referenced.

The final chapter, "Mise-en-Scène," covers two significant areas in the history of pc set theory: the computer and the university. Again, Schuijer offers the reader an oft-neglected facet of this theory: "Few people realize that PC set theory was actually devised for computer-aided analysis—today, this fact is ignored in most analytical textbooks" (237). It is stimulating to have these truths stated so clearly. Forte's computer system would do three things with a musical score: encode, parse, and interpret (242). And once the information was input—just how this was done is explained by Schuijer—the computer would essentially do a pc set analysis of the input composition (the seven aspects of such an analysis are from an earlier work by Forte and are enumerated on page 247 of Schuijer's book). In pulling off this computer project, Forte essentially gave us many of pc set theory's basic notions: "'PC set,' 'normal' or 'prime form,' and 'interval vector' have become household concepts for many music theorists, but in the mid-1960s they met a very specific need: the need for definitions of musical relations that a computer program could recognize" (248).

The second half of Chapter 8 is on the role of the university in the development of American pc set theory. The central figures in this story are, once again, Babbitt and Forte, whose contributions Schuijer documents exhaustively. Important here is the pedagogical role that pc set theory has played in the formation of an American music theory. In stressing this didactic element, Schuijer ultimately lays bare a significant point not often made about pc set theory:

> If PC set theory claims that PC set relations form the common theoretical basis of a body of twentieth-century art music larger than serial twelve-tone music, it should enable us to validate that claim. This requires the consultation of sources outside the domain of the theory, which is restricted to scores.
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> Seen thus, PC set theory is not an explanatory theory, but the codification of an analytical practice. As such, it bears no substantial relation to modern science, even though it appeals to a scientific sense of objectivity and consistency. (270)

Indeed! I imagine some may question whether this codification constitutes a "theory" at all. Yet Schuijer does not mean this in a disparaging way. He continues to discuss the virtue in the pedagogical element of pc set theory (and acknowledges the paramount role that Forte played therein), and how the theory is part of a "'democracy of learning' so firmly anchored in the American self-image." Further, "PC set theory is not only the product of the scientification of music theory, but also of a commitment to education. Whoever rejects its formalism and reductionalism, and finds its language inappropriate, should bear in mind that these aspects serve the purpose of equal opportunity" (277), to which I add, "hear, hear!" Who but a non-American could possibly provide such insight?

If I could think of one word to describe *Analyzing Atonal Music* it would be "refreshing." To read the history of pc set theory from Schuijer's unique perspective, and from the perspective of time as well—many of the key issues surrounding this theory date back to the 1950s and 1960s—is remarkably refreshing indeed. It is no surprise that the book won the Emerging Scholar Award from the Society of Music Theory in 2010. There are so many pearls of wisdom in this book that it should really be required reading for any core curriculum of the music theory doctoral degree.

While criticizing such a wonderful work is not easy, I could offer two criticisms of interest. The first concerns scope. I was struck by the absence of a proper Conclusion in *Analyzing Atonal Music*. In fact, I yearned for one. The book is so good, and Schuijer's perspective so rare, it left me wanting to read his own summation of his work. What larger conclusions would he draw? What overarching trends does he see? What is the future, from his perspective, of American music theory? He touches on these issues throughout the book, but a formal Conclusion would have improved what is, essentially, his magnum opus. Of course, at 306 pages of dense reading, it is hard to add more material. Thus, I would have suggested certain cuts. For example, as I was reading about the history of inversion (62–67), I was wondering whether some of this material—on Vicentino, Zarlino, Marpurg and Fux—could not have been cut. From a historical perspective it is fascinating, but a streamlining of such sections could have helped. Also, the discussion of Fauré's *Élégie* for Cello and Piano, op. 24 (180–83), seemed somewhat misplaced to me. In fact, there were several moments when I thought to myself whether some material, because there is such an enormous wealth of it, may have been left out. I suppose it may sound nitpicky, but I do believe the balance could have been improved. Put another way, at times *Analyzing Atonal Music* reads more like the dissertation whence it came (an outstanding dissertation at that) than a self-contained book, and I felt that the author had, by the end, simply run out of steam.

My second criticism has to do with the omission of some of the Webern studies that came out of Europe, for instance, those of Metzger (1958), Kolneder (1968), Kholopova (1973), and Kholopova/Kholopov (1999). Though all of these works are somewhat simplistic, they provide interesting parallel developments to American pc set theory. It is likely that these European authors were entirely unaware of what was happening in the United States.[5]

Metzger's work is succinct, but important.[6] He identifies the twelve trichords most often associated with pc set analysis, calling them "interval complexes" (1958, 76). Example 1 shows the twelve complexes identified by Metzger, which correspond to the twelve trichords most often identified in pc set theory. I have added the Forte numbers below in the example. About these trichords with respect to Webern's op. 15 no. 2, Metzger writes:

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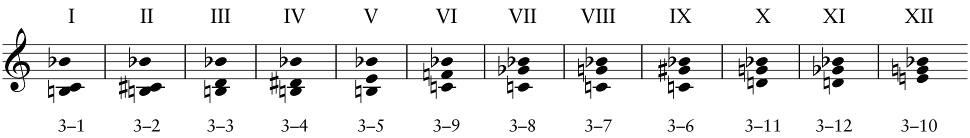
[5] Metzger's and Kolneder's work either predated or appeared concurrently with many of the seminal works of Babbitt and Forte, while Kholopova confirmed to me in person that she and her brother had no American sources as they worked on Webern in the late 1960s.

[6] Metzger 1958 first appeared in 1955, in German, in the second issue of *Die Reihe*, under the editorship of Herbert Eimert and Karlheinz Stockhausen, as "Analyse des Geistlichen Liedes op. 15, no. 4" (Wien: U.E.). It is all the more strange that Schuijer did not include this work in *Analyzing Atonal Music* insofar as he makes mention of this journal and its impact (261n31).



EXAMPLE 1

Metzger, Twelve Interval Complexes (1958, 76; Forte numbers added below)

> The music contains no hint of any thematic relationships. The three-part texture however—the possibility of making three notes sound together—directly underlies its organisation. In our tempered system this possibility is determined by twelve interval-complexes (together, of course, with their transpositions, inversions, register permutations, etc.). These are the real form-building elements of the song. Unfolded horizontally they make up the motivic cells within the parts, vertically the simultaneous sounds of the acoustic web, "diagonally"…its "brackets." (76)

He goes on to analyze Webern's op. 15 no. 4, using his interval complexes. Example 2 shows the first two measure of this analysis. In it we see a pc set analysis based on the twelve complexes. Metzger generally analyzes all three-note segments horizontally and many of the vertical and diagonal sets. Of course, any three-note group will be a member of one of the twelve complexes; I offer this example here to simple put it up against other currents that were happening in the 1950s.

Kolneder's system of analyzing Webern also bears many similarities to early pc set analysis as practiced in the United States.[7] He claimed that Webern's sonorities were formed from a "framework interval," which was simply one of the eleven ordered pc intervals (as mentioned, Schuijer's *pitch-interval class* or PIC) from 1 to 11 inclusive. Additionally, Kolneder added a semitone above and below each of the lower and higher notes of each framework interval to come up with the nine basic trichords shown in example 3.[8] The framework intervals in these nine trichords are: I: E–F; IIa and IIb: E–F♯; IIIa and IIIb: E–G; IVa and IVb: E–G♯; and Va and Vb: E–A. Kolneder shows how, with larger ordered pc intervals (namely, 6 to 11 inclusive), the addition of a semitone above or below the higher or lower note simply duplicates one of the archetypal trichords that he has formed. Note how, unlike Metzger, Kolneder's nine basic trichords all feature a semitone, which he felt to be emblematic of Webern's sound. He also felt that each trichord could come in three inversions, like triads in tonal harmony. Kolneder says,

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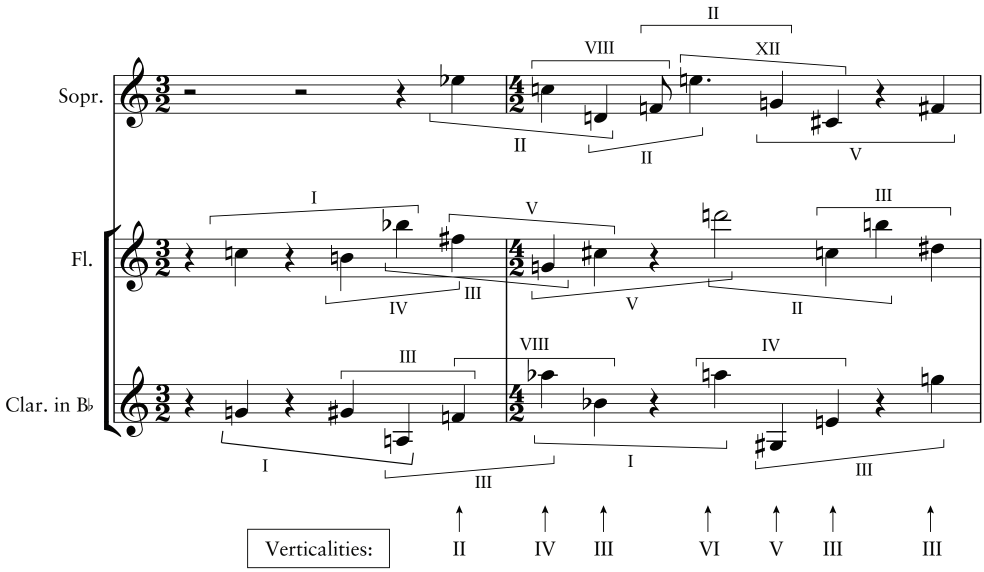
7 Kolneder 1968 first appeared in 1961, in German, as *Anton Webern: Einführung in Werk und Stil* (Rodenkirchen/Rhein: P. J. Tonger Musikverlag).

8 Kolneder makes the same distinction between inversionally related trichords that Pople made (1989; see n.3).



EXAMPLE 2

Metzger, Analysis of Webern's *Fünf geistliche Lieder*, op. 15 no. 2 ("Morgenlied") (1958, 76; excerpted, clarinet written at pitch)

"thus nine triads remain which are different in structure, marked I, IIa, IIb, IIIa, IIIb, IVa, IVb, Va, Vb, of which each can appear in the three forms of the basic position, the first and the second inversion" (40). From here he adds two semitones to each framework intervals to make tetrachords, though this is not spelled out as systematically. After the layout of this system, Kolneder uses these trichords in analyzing excerpts by Webern.

The most refined system of pc set analysis among the Europeans is by Kholopova (1973). She contrived this system in the late 1960s with the help of her brother, Yuri Kholopov.[9] Building on Kolneder's work, they called their system "hemitonicism," basing it on the ubiquity of semitonal movement in Webern's works. This system featured five trichords with five related tetrachords, shown in Example 4. The distinguishing factor with the groups is the semitonal content, noted in the example as 1H, 2H, etc., below the groups. The five tetrachordal hemitonic groups, distinguished as letter "b" groups as opposed to letter "a" groups, are based on the trichordal groups in that each four-note

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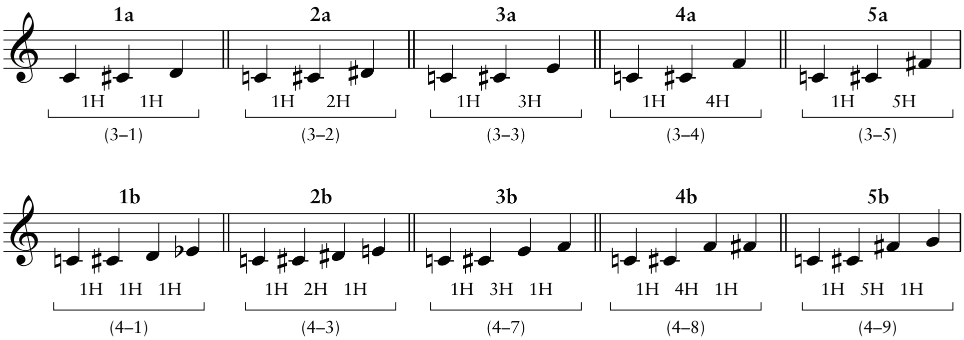
[9] She confirmed this timeframe to me in a personal correspondence. Kholopova and Kholopov (1999) has a long chapter on this system of pc set analysis. Though they did all the work for the two books they wrote on Webern in 1965–70, the second book only appeared in 1999, while the first appeared in 1984. Simply put, there was little interest or support for the work that they were doing on Webern in the 1960s in the Soviet Union.

EXAMPLE 3

Kolneder, “Formation of Triads” (1968, 39; excerpted, Forte numbers added)



EXAMPLE 4

Kholopova, Hemitonic Groups (1973, 334; Forte numbers added)

version contains two versions of the accompanying trichords. So, for example, the trichord 2a, shown by (C, C♯, D♯) as a prime form, is contained twice in tetrachord 2b, once as (C, C♯, D♯) and once again as (C♯, D♯, E)—this is why they are both numbered with an Arabic numeral “2.” In other words, with the ten hemitonic groups, both transpositional and, more important, inversional equivalence are at play. So, in short, we have a subsystem of pitch-class set analysis, represented by ten set classes. The Kholopovs say that, “the 5 hemitonic groups, along with their [four-note] derivatives, give a complete classification of combinations of a given semitone with all intervals of the chromatic system" (1999, 17).

Example 5 shows their analysis of the vocal line from Webern's op. 16 no. 1. Note right away that not one note of the vocal line is left out, and all ten hemitonic groups are used. This example also shows Webern's predilection for group "3," which happens eight times in all, out of 25 segmented sets. Because of his affinity for group 3, the Kholopovs call this the "Webern Hemitonic Group."

The Kholopovs also do chordal analyses with hemitonic groups. In Example 6, their analysis of Webern's op. 6 no. 4, mm. 8–11, we once again see the prominence of group 3, accounting for all but two chords. Note in the second chord the combination of two instances of group 3a, the trichordal version. Instead of coming up with a new classification for a new type of tetrachord—in this case (0347) or Forte number 4–17—the Kholopovs viewed the sonority as the combination of two trichordal hemitonic groups.

Insofar as American pc set theory was, ultimately, born of three composers—Schoenberg, Webern, and Berg—I think it would have been appropriate for Schuijer to include the important contributions of Metzger, Kolneder, and the Kholopovs, with respect to Webern studies.[10] Most important, these parallel European developments provide a firm rebuttal to those who would say, "we do not *talk* about pitch-class sets, because we do not *hear* them!"

Whatever its shortcomings, *Analyzing Atonal Music* is, by any measure, a tour de force. In fact, the book may have been more accurately entitled "A History of American Music Theory." Along with pc set theory, there are very few stones left unturned. Cognition, transformational theory, contour theory, Schenker, mathematical developments, the New Musicology and its relation to music theory, and history of theory, among many other relevant topics, are touched on, and often in more than a cursory fashion. The amount of research that went into Schuijer's work is staggering and, realizing that he is doing this research not in his native language, astounding. True, by cutting out some material and some of the detail, and by adding a proper Conclusion, I believe the work could have been improved. This is to take nothing away from his stellar accomplishment however. Let *Analyzing Atonal Music* stand as the definitive history of pc set theory, for now, and for many years to come.

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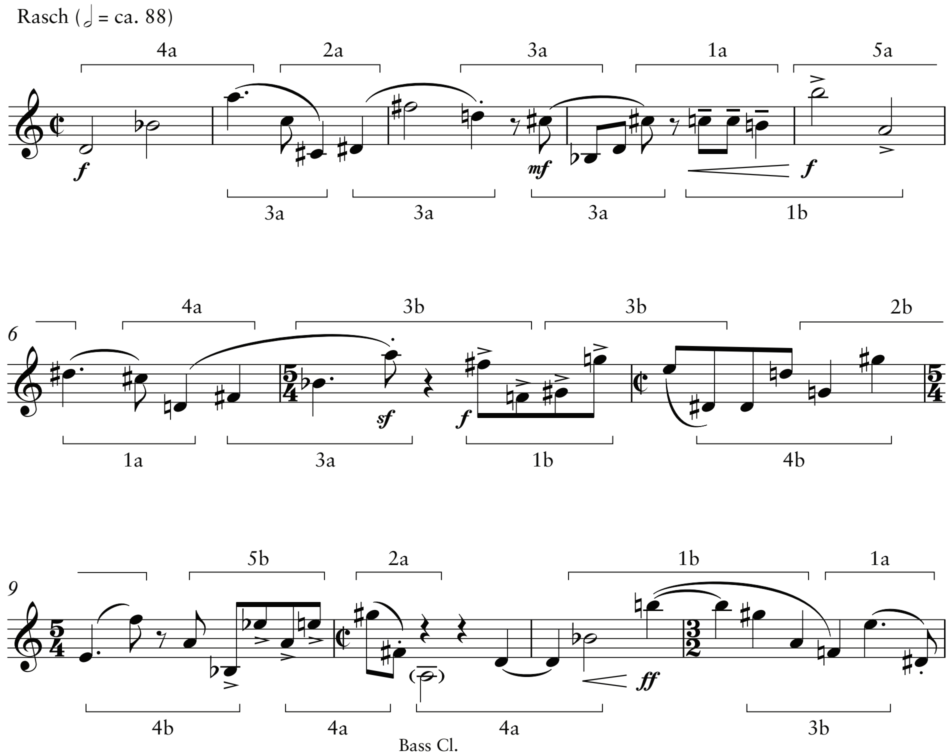
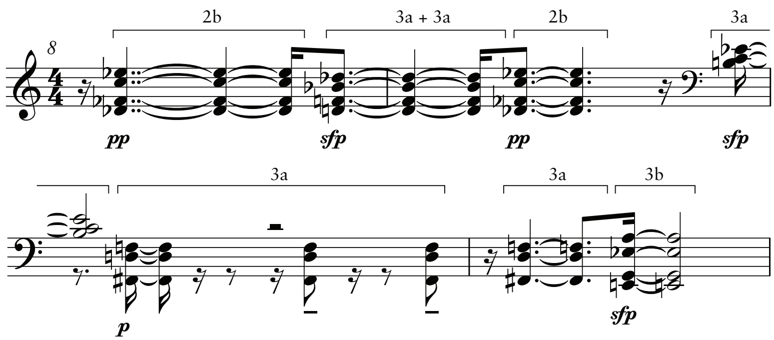
[10] Three other European works that analyze pc sets in Webern's music are Karkoschka 1959, Pousseur 1958, and Stockhausen 1963, 58. Pousseur 1958 first appeared in 1955, in German, in the second issue of *Die Reihe*, under the editorship of Herbert Eimert and Karlheinz Stockhausen, as "Weberns organische Chromatik (1. Bagatelle)" (Wien: U.E.).



EXAMPLE 5

Kholopovs, Analysis of Webern's *Fünf Canons*, op. 16 no. 1
("Christus factus est pro nobis"),vocal line (1999, 19–20)



EXAMPLE 6

Kholopovs, Analysis of Webern's *Sechs Stücke für großes Orchester*,
op. 6 no. 4, mm. 8–11, (1999, 20)

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