PITCH ORGANIZATION AND FORM IN BARTÓK'S SONATA FOR PIANO (1926)

by

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ABSTRACT

Although Béla Bartók's music has attracted a significant amount of analytical and theoretical attention, the Sonata for Piano (1926), in contrast with some of the composer's other works such as the String Quartets and *Mikrokosmos*, has received comparatively little treatment. This thesis presents a comprehensive analysis of the Sonata's pitch resources, offering a pitch-class (pc) set-theoretical and pc set-generic analysis of each of the Sonata's three movements. The thesis maintains that pc set theory in combination with pc set genera theory provides the analyst with an appropriate and effective basis by which to explore important aspects of the Sonata's pitch materials. Specifically, the thesis demonstrates that within each of the Sonata's three movements, interconnections between form, motivic-thematic materials, pc sets, and pc set genera work together in forging large-scale structures. The thesis concludes by offering suggestions for further investigation.

Keywords: Béla Bartók, characteristic set-classes, diatonicism, form, Allen Forte, inclusion relations, Michael Konoval, octatonicism, Richard S. Parks, pitch-class set genera theory, pitch-class set theory, referential collections, Sonata for Piano, Joseph Straus, symmetry, Paul Wilson

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CHAPTER 1

INTRODUCTION

This thesis presents a pitch-class (pc) set-theoretical and pc set-generic analysis of Béla Bartók's Sonata for Piano (1926). While the theoretical constructs surrounding pc set-theoretical and pc set-generic relationships overlap, certain factors distinguish these two types of relationships. For example, pc set-theoretical relationships focus primarily on relations of equivalence, inclusion, complementation, union, and intersection, while pc set-generic relationships examine interrelationships among *families* of set-classes (scs) associated on the basis of inclusion, intersection, and union around a single nexus set-class (sc) or group of scs.

The thesis maintains that pc set theory in combination with pc set genera theory provides an appropriate and effective basis for explaining important aspects of the Sonata's pitch materials. The analytical chapters present analyses of the Sonata's three movements respectively. Each chapter consists of a discussion of form, pc set relations, and pc set-generic relations. The thesis examines large-scale structural relationships within each of the three movements, in particular, relationships within the domains of pitch and pc set genera. The analyses demonstrate that formal divisions identified primarily through examination of thematic-motivic associations are also supported by pitch-structural relationships. These examinations show that the Sonata for Piano (1926) is a highly structured multi-movement work. The thesis concludes with summary observations followed by suggestions for further investigation.

Bartók's Piano Music

Béla Bartók's early musical instruction was provided by his mother Paula Voit (1857-1939) who, when Bartók was only five years old, assumed the role of his piano teacher.[1] Bartók's musical education was eventually continued in Budapest where he studied piano and composition at the Academy of Music, graduating in June 1903. It was believed that Bartók, notwithstanding his interest in composition, would have a career as a virtuoso pianist. In fact, many of his compositions for solo piano were written for his own performances. For instance, Bartók completed his first mature work for solo piano, Rhapsody, Op. 1, during the autumn of 1904 following his graduation from the Academy, and premiered it on May 25, 1905, in Újpest, Hungary.[2] Bartók also arranged and performed

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[1] I have drawn on the following sources for biographical information: *Béla Bartók, Essays*, ed. Benjamin Suchoff (New York: St. Martin's Press, 1976); *Béla Bartók Letters*, ed. János Demény (London: Faber and Faber, 1971); Malcolm Gillies ed., *The Bartók Companion* (London: Faber and Faber, 1993); Paul Griffiths, *Bartók*, The Master Musicians, Stanley Sadie ed., (London and Melbourne: J.M. Dent and Sons Ltd., 1984); Vera Lampert and Láslzó Somfai, "Bartók, Béla" in *The New Grove Dictionary of Music and Musicians*; idem, "Béla Bartók," in *The New Grove Modern Masters: Bartók, Stravinsky, Hindemith*, Stanley Sadie ed. (New York: W.W. Norton & Company, 1984), 1-101; Halsey Stevens, *The Life and Music of Béla Bartók*, rev. ed. (New York: Oxford University Press, 1964); Jósef Ulfalussy, *Béla Bartók*, trans. Ruth Pataki, trans. rev. Elisabeth West (Budapest: Corvina Press, 1971). Sources concur except where indicated.

[2] For a complete list of Bartók's juvenile compositions, including the popular Four Pieces for Piano of 1903, see Denis Dille, *Thematisches Verzeichnis der Jugenwerke Béla Bartóks* (Budapest: Akadémiai Kiadó, 1974). Paul Griffiths incorrectly states that the Rhapsody was first performed by the composer in Bratislava on November 4, 1906. See "appendix B" in *Bartók*, 201. This date, however, corresponds to the second performance of the Rhapsody by the composer as noted in Günter Weiss-Aigner's, "Youthful Piano Works," in *The Bartók Companion*, 109.

the Rhapsody for piano and orchestra for the Paris Rubinstein competition in 1905. Unfortunately, a lack of funds resulted in the composition prize not being awarded that year; however, of the five composers who entered the competition, only Bartók and Brugnoli received certificates for their efforts.[3]

In January 1907 Bartók was appointed professor of piano at the Budapest Academy of Music, a position that he held until 1934. Bartók's experience as a pedagogue appears to have influenced his choice of genre with respect to his piano music. Many of the composer's most popular works were written with the young piano student in mind. For example, Bartók himself remarked in the introduction to a collection of his piano works (*Béla Bartók Masterpieces for the Piano*, 1945): "The Ten Easy Pieces [1908]...are a complement to the [Fourteen] Bagatelles [1908]. The former were written with pedagogical purposes, that is, to supply piano students with easy contemporary pieces. This accounts for the still more simplified means used in them."[4] Additional collections written with the student in mind are: *For Children* (1908-1909), The First Term at the Piano (1913), Romanian Christmas Carols (1915), Romanian Folk Dances (1915), Fifteen Hungarian Peasant Songs (1914-1918), Three Studies (1918), Nine Little Pieces (1926), and the extensive six-volume *Mikrokosmos* written between 1926 and 1939.[5]

Bartók's compositions for piano were not only guided by his pedagogical ingenuity; indeed, as was noted above, Bartók also composed a great deal of music for the concert stage, allowing him to expand his own concert repertoire. During the 1920s Bartók was

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[3] Lampert and Somfai, "Béla Bartók," 9.

[4] Quoted in *Béla Bartók Essays*, 432.

[5] The first two volumes of the *Mikrokosmos* are dedicated to the composer's second son Péter Bartók.

particularly active as both a composer and pianist. His performance engagements included tours of Western Europe, the Soviet Union, and the United States. In addition, he often performed his works for piano and violin with the renowned Hungarian violinists Josef Szigeti and Zoltan Székely.[6]

Although Bartók had written quite a large number of works for piano by 1926, he had yet to compose a concerto for the instrument. The First Piano Concerto, written in 1926, was premiered by the composer in Frankfurt am Main on July 1, 1927. Accounts of the Concerto receiving performances (shortly after the premiere), with Bartók as soloist, in London, Prague, Warsaw, and Vienna, supports the notion that Bartók wrote the First Piano Concerto, at least in part, for his own performance engagements.[7] In fact, one year later, in 1928, the Concerto was again programmed with the composer as soloist, in New York, Boston, Cincinnati, Budapest, Cologne, Berlin, Amsterdam, The Hague, and Erfurt.[8]

The year 1926 marks an important landmark in Bartók's compositional oeuvre for the piano, a year that has affectionately been referred to as the composer's "Piano Year."[9]

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[6] Bartók dedicated his First Rhapsody and *Contrasts* to Szigeti and his Second Rhapsody and Second Violin Concerto to Székely. The American violinist Yehudi Menuhin commissioned the last work Bartók finished: the Sonata for Solo Violin.

[7] A Second Piano Concerto soon followed in 1931 receiving over twenty performances by the composer between the years 1934 and 1941. Unfortunately, due to Bartók's failing health, the Third (and final) Piano Concerto of 1945 was not premiered by the composer. The concerto received its premiere under Eugene Ormandy and the Philadelphia Orchestra on February 8, 1946. The soloist was György Sándor. See Stevens, *The Life and Music*, 335.

[8] For a detailed discussion of these performances see János Kárpáti, "The First Two Piano Concertos," in *The Bartók Companion*, 498-514.

[9] See for example, László Somfai, "The Piano Year," in *The Bartók Companion*, 173-188, and idem, "Analytical Notes on Bartók's Piano Year of 1926," *Studia Musicologica* 26 (1984): 5-58.

From June through November Bartók produced not only the Sonata for Piano and the First Piano Concerto but also the suite *Out of Doors*, Nine Little Pieces, and three pieces that would eventually serve as nos. 81, 137, and 146 of *Mikrokosmos*.

The Sonata for Piano (1926)

Of Bartók's mature works, the Sonata for Piano (1926) represents the composer's only attempt at the genre.[10] The Sonata was dedicated to Bartók's second wife Ditta Bartók (Pásztory).[11] The edition used for this study is the Universal Edition (8772) of 1927 (reprinted by Boosey and Hawkes in 1955).[12] Using the manuscript, Bartók premiered the Sonata on Hungarian Radio on December 3, 1926. A second performance followed on December 8 in the Great Hall of the Budapest Academy of Music.[13] Unfortunately, a recording by the composer has yet to be discovered.[14]

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[10] The Sonata is preceded by four juvenile works for solo piano also titled Sonata. These works are: the Sonata No.1 in g minor (1894); the Sonata No. 2 in F major (1895); the Sonata No.3 in C Major (1895-lost); and the Sonata (1898-lost). See Vera Lampert and László Somfai, "Bartók, Béla," 222-225.

[11] The inscription, appearing after the final measure in the printed score (Universal Edition 8772) reads: "Dittának, Budapesten, 1926. Jun." [To Ditta, Budapest, June 1926]. A translation of the dedication appears in László Somfai's *Commentary* (Budapest: Editio Musica, 1980) to the facsimile edition of the MS, in the form of the composer's second draft, published by Universal Edition in collaboration with *Editio Musica Budapest* for the hundredth anniversary of Bartók's birth.

[12] Béla Bartók, Sonata for Piano (Vienna: Universal Edition, 1927; reprint, New York: Boosey and Hawkes, 1955).

[13] It is of interest to note that during these concerts, Bartók performed selections from two additional piano works of 1926: the first, fourth, and fifth pieces from *Out of Doors*, and the first eight of the Nine Little Pieces. Somfai, "The Piano Year," 174.

[14] All surviving recordings of Bartók's performances are contained in two sets of recordings issued by Hungaroton (LPX 12326-33 and LPX 12334-38).

In his introduction to *Béla Bartók Masterpieces for the Piano* (1945) Bartók observed that:

> ...As later developments show, the Bagatelles [1908] inaugurate a new trend of piano writing in my career, which is consistently followed in almost all of my successive piano works with more or less modifications, as for instance...in the Sonata for Piano [which represents] (an enlargement of the newly won means)....[15]

Unfortunately, Bartók's reflections on his own compositions are not as revealing as we might hope for. Although it is difficult to know with certainty what Bartók was referring to by the Sonata's "enlargement of the newly won means," it seems reasonable to speculate that the composer was reflecting on the Sonata's harmonic and formal design, both of which will be examined in the following analyses.

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[15] *Béla Bartók Essays*, 432.

Theoretical-Analytical Studies of Bartók's Music and the Sonata for Piano (1926)

Bartók's music has received a significant amount of analytical and theoretical attention since the composer's death in 1945. Much of that attention has focused on the String Quartets and *Mikrokosmos*.[16] More recently, however, scholars have attempted to present theories that encompass the entire range of Bartók's compositional oeuvre. In assessing these analytical and theoretical studies, the work of Ernó Lendvai, Elliott Antokoletz, and Paul Wilson must be given consideration.[17] The significance of these authors lies in their attempts to present comprehensive theories of Bartók's music. Lendvai, Antokoletz, and Wilson have set forth analytical and theoretical models that endeavor to account for the entire range of Bartók's oeuvre. In acknowledging the significance of these

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[16] See especially Elliott Antokoletz, "Principles of Pitch Organization in Bartók's Fourth String Quartet" (Ph.D. diss., City University of New York, 1975); Milton Babbitt, "The String Quartets of Béla Bartók," *Musical Quarterly* 35 (1949): 377-385; Wallace Berry, "Symmetrical Interval Sets and Derivative Pitch Materials in Bartók's String Quartet No. 3," *Perspectives of New Music* 18 (1979-1980): 287-380; Peter Child, "Structural Unities in a Work of Bartók: 'Boating' from Mikrokosmos, Vol. 5," *College Music Symposium* 30 (1990): 103-114; William Dale Dustin, "Two-Voiced Textures in the Mikrokosmos of Béla Bartók" (Ph.D. diss., Cornell University, 1959); Charles D. Morrison, "Prolongation in the Final Movement of Bartók's String Quartet No. 4," *Music Theory Spectrum* 13.2 (1991): 179-196; Richard S. Parks, "Harmonic Resources in Bartók's 'Fourths'," *Journal of Music Theory* 25.2 (1981): 245-274; George Perle, "Symmetrical Formations in the String Quartets of Béla Bartók," *Music Review* 16 (1955): 300-312; Lawrence Star, "Melody-Accompaniment Textures in the Music of Bartók as seen in his Mikrokosmos," *Journal of Musicology* 4 (1985-1986): 91-104, and idem, "Mikrokosmos: The Tonal Universe of Béla Bartók" (Ph.D. diss., University of California at Berkeley, 1973); Leo Treitler, "Harmonic Procedure in the Fourth Quartet of Béla Bartók," *Journal of Music Theory* 3 (1959): 292-297.

[17] Ernó Lendvai, *Béla Bartók: An Analysis of his Music* (London: Kahn and Averill, 1971) and idem, *The Workshop of Bartók and Kodály* (Budapest: Editio Musica Budapest, 1983); Elliott Antokoletz, *The Music of Béla Bartók: A Study of Tonality and Progression in Twentieth-Century Music* (Berkeley: University of California Press, 1984); Paul Wilson, *The Music of Béla Bartók* (New Haven: Yale University Press, 1992).

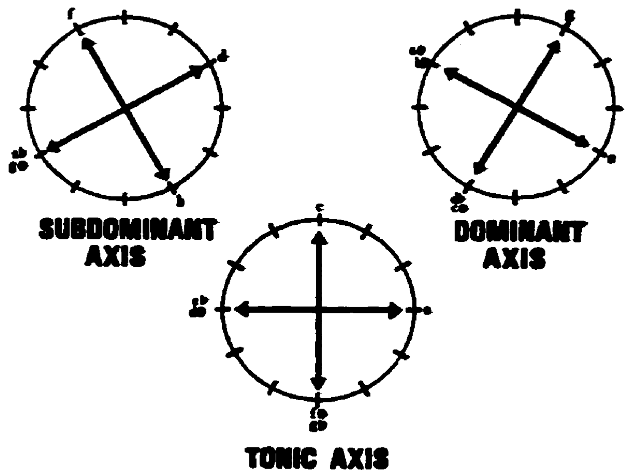
works, however, it is not my intention to promote the notion that a unified theory of Bartók's music is an ideal to which an analyst must necessarily aspire. Indeed, whether or not such an approach is realistic, necessary, or ultimately desirable, is an issue that needs to be examined independently.

Ernó Lendvai presents an examination of Bartók's music in two important books: *Béla Bartók: An Analysis of his Music*, and *The Workshop of Bartók and Kodály*. The theory is presented explicitly in *Béla Bartók: An Analysis of his Music*. There are two main principles upon which the theory is based: the tonal principle and the formal principle. The tonal principle refers to Lendvai's "axis system" in which the aggregate of twelve pitch-classes (pcs) is divided into three partitions (each containing four pcs) referred to respectively as the "tonic axis," the "subdominant axis," and the "dominant axis."[18]

The three axes are formed in relation to the circle of fifths beginning on C. C is referred to as the "tonic," G, the "dominant," and D, the "subdominant" (given its relationship to the next pitch-class (pc) in the cycle of fifths, A). This sequence (tonic, dominant, and subdominant) is continued until all of the twelve pcs have been accounted for (see figure 1.1).

[18] Lendvai, *Béla Bartók*, 3. For a comprehensive summary of Lendvai's axis system see "Appendix 1" in Paul Wilson, *The Music of Béla Bartók* (New Haven: Yale University Press, 1992), 203-208.

Figure 1.1. The axis system[19]



Although the three axes effectively partition the aggregate of twelve pcs into three diminished-seventh chords, Lendvai cautions that: "It is essential that the particular axes should not be considered as chords of the diminished seventh, but as the functional relationships of four different tonalities. . . ."[20]

Lendvai's formal principle refers to his strong belief that Bartók's compositions are constructed formally in terms of natural proportions; that is, proportions often found in nature. The theory relies heavily on proportional constructions such as the Golden Section (or geometric mean). Symmetrical relationships are also emphasized with respect to formal design. It should be pointed out that symmetrical relationships are inherent in Lendvai's tonal principle as well, in which the aggregate of twelve pcs is partitioned symmetrically into three axes. Symmetry and proportion are at the core of Lendvai's theory.

However, the title of Lendvai's book *Béla Bartók: An Analysis of his Music* is misleading. Rather than providing detailed analyses of Bartók's works in support of his

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[19] Taken from Lendvai, *Béla Bartók*, 3.

[20] Lendvai, *Béla Bartók*, 3.

theory, Lendvai presents brief examples from various compositions in an effort to illustrate isolated theoretical constructs.

In *The Music of Béla Bartók: A Study of Tonality and Progression in Twentieth-Century Music,* Elliott Antokoletz also sets out to present a systematic theory of Bartók's music. The author begins by placing the composer's music into an historical framework. He then examines the composer's musical language in terms of his folk- and art-music influences. Following a discussion of Bartók's harmonization of authentic Eastern-European folk melodies—through an examination of the composer's early compositions—Antokoletz explores what he considers to be Bartók's symmetrical transformations of folk modes through an examination of the composer's mature works.

For Antokoletz, symmetrical constructions and transformations of pitch materials are of particular importance and are the primary concepts upon which his theory is based. Central to Antokoletz's theory is the notion of interval cycles.[21] Antokoletz defines an interval cycle as "...a series based on a single recurrent interval, the sequence of which is completed by the return of the initial pitch-class at the octave."[22] Through interval cycles and axes of symmetry, Antokoletz examines Bartók's incorporation of various symmetrical pitch constructs in a number of compositions: Fourteen Bagatelles for Piano, op. 6 (1908), Eight Improvisations on Hungarian Peasant Songs for Piano, op. 20 (1920), selections from

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[21] Antokoletz was greatly influenced by George Perle, with whom he studied. Perle's work on Bartók and on interval cycles and symmetrical constructions in general is well known. See Perle, "Symmetrical Formations in the String Quartets," cited above and idem, *Twelve-Tone Tonality* 2d ed. (Berkeley: University of California Press, 1996). For a detailed discussion of Perle's theory of twelve-tone tonality, see Gretchen Foley, "Pitch and Interval Structures in George Perle's Theory of Twelve-Tone Tonality" (Ph.D. diss., University of Western Ontario, 1999).

[22] Antokoletz, *The Music of Béla Bartók*, xii.

the *Mikrokosmos* (1926-1939), the Third Piano Concerto (1945), Music for Strings, Percussion, and Celesta (1936), the Concerto for Orchestra (1943), Eight Hungarian Folk Songs (1907-1917), *Duke Bluebeard's Castle* (1911), and *Cantata Profana* (1930). The most extensive analysis, however, is devoted to the Fourth String Quartet (1928), the subject of the author's dissertation.[23]

Antokoletz's study represents an impressive accomplishment; however, the narrow focus of his theory, which states that Bartók's music can be understood through "...an all-encompassing system of [symmetrical] pitch relations,"[24] presents a rather restrictive and limiting view of Bartók's total musical output. Not only are musical parameters other than pitch organization insufficiently dealt with under Antokoletz's theory, but issues such as large-scale pitch-structural organization are often left unexamined.

Paul Wilson's book *The Music of Béla Bartók* is divided into two sections in which the theory is presented in part one and several detailed analyses (including an analysis of the Sonata for Piano) are presented in part two. Like Antokoletz, Wilson presents analyses of different instrumental genres. His book includes detailed discussions of the following works: The Sonata for Piano (1926), the Third String Quartet (1927), movements two and four of the Fifth String Quartet (1934), movements one and two of the Sonata for Two Pianos and Percussion (1937), and movement one of the Concerto for Orchestra (1943). Although these compositions represent examples only from Bartók's mature style, Wilson claims that his theory is not limited to these works.

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[23] Antokoletz, "Principles of Pitch Organization."

[24] Antokoletz, *The Music of Béla Bartók*, xii.

Wilson draws on conventional set-theoretical concepts in his theory but he is careful to limit his choice to those involving small-scale frameworks. With respect to large-scale frameworks, Wilson cautions that "...[Bartók's] music seldom exhibits the consistent vocabulary of set-types or inclusion and complementation relationships that render a large-scale set-theoretical approach fruitful,"[25] a position which this thesis seeks to refute.

Equally essential to Wilson's theory is his use of traditional harmonic functions from which he draws analogous functional relationships in an effort to define structural hierarchies. Wilson makes it clear, however, that his use of harmonic functions in no way represents his endorsement of "neo-Schenkerian"[26] principles of prolongation as expressed in the writing of Felix Salzer and Roy Travis.[27]

Although Wilson's theory presents a flexible approach to understanding Bartók's musical language from both tonal and atonal perspectives, his theory of structural hierarchies tends to promote a less than systematic analytical methodology. This appears to stem, in part, from the theory's incorporation of both tonal and atonal theoretical constructs.

Among the most important secondary sources that treat the Sonata analytically are Sheila Waxman's D.M.A. dissertation; Michael Konoval's D.M.A. dissertation; and the third chapter from Paul Wilson's *The Music of Béla Bartók*.[28] Of these three studies, the last two are

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[25] Wilson, *The Music of Béla Bartók*, 20.

[26] Ibid., 190.

[27] See for example, Felix Salzer, *Structural Hearing: Tonal Coherence in Music*, 2d ed. (New York: Dover, 1962); Roy Travis, "Towards a New Concept of Tonality?," *Journal of Music Theory* 3 (1959): 257-284.

[28] Sheila Waxman, "Béla Bartók's Sonata for Piano: An Analytical Study" (D.M.A. diss., Boston University, 1985); Michael Konoval "An Analytical Study of Béla Bartók's Sonata for Piano (1926)" (D.M.A. diss., University of British Columbia, 1996); Paul Wilson, "The Sonata for Piano," in *The Music of Béla Bartók*, 1992, 55-84.

the most comprehensive and have consequently served as points of departure for this study.[29]

In his analysis of the Sonata for Piano, Konoval's primary concern is to examine the extent to which Bartók presents a parody of classical sonata movements; specifically, the sonata-allegro form of the first movement and the rondo-like form of the last movement. As a result, Konoval focuses almost exclusively on thematic transformations, examining relationships of transposition and inversion. While I also examine the Sonata's formal plan, I do not confine myself to a consideration of these operations of equivalence; that is to say, my formal plan for each of the movements is not determined by equivalence relationships of pc sets. In addition, although Wilson briefly acknowledges larger referential scs in his analysis of the Sonata, he is primarily concerned with smaller scs: trichords, tetrachords, and pentachords. This study examines relationships involving both large and small scs. And, whereas inclusion relationships form a substantial part of this thesis's analytical methodology, the same cannot be said of Konoval's and Wilson's analyses.

Although both Konoval and Wilson rely on pc set-theoretical techniques in their analyses, neither author explores the pc set-generic makeup of the Sonata. Consequently, not only does my analytical methodology diverge from Konoval's and Wilson's—in terms of the kinds of set-theoretical relationships examined—but my subsequent focus on the Sonata's pc set-generic makeup also provides me with a unique perspective from which to examine the work.

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[29] In addition, Joseph Straus presents a brief but significant analysis of the first movement of the Sonata for Piano in *Remaking the Past: Musical Modernism and the Influence of the Tonal Tradition* (Cambridge, Mass: Harvard University Press, 1990), 107-113. This analysis will be considered in chapter 2.

Pitch-Class Set and Pitch-Class Set Genera Theory and their Application to Bartók's Sonata for Piano (1926)

Although a number of authors have explored the theoretical and analytical applications of pc set generic theories,[30] the literature is not as well established as that which has been devoted to pc set theory, in particular since the publication of Allen Forte's seminal book *The Structure of Atonal Music*.[31] As a result, while the reader may not be as familiar with the literature surrounding pc set generic theories (to be examined below), it is assumed that the reader will be familiar with general set-theoretical concepts such as: equivalence, sc inclusion, and complementation. Of these relationships, sc inclusion is given particular emphasis in order to demonstrate the degree to which the pitch materials within each of the movement's sectional divisions (identified through an examination of thematic-motivic associations) are interconnected. This prepares the way for the subsequent examination of pc set-generic relationships. The degree to which the pitch materials within each of the movement's sectional divisions are related (through sc inclusion) is taken a step further by the investigation of each section's generic characteristics; that is to say, not only are

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[30] The following sources have provided a theoretical basis for this aspect of my study: John Doerksen, "A Theory of Set-Class Salience for Post-Tonal Music with Analyses of Selected Lieder by Anton Webern" (Ph.D. diss., University of Western Ontario, 1994); Allen Forte, "Pitch-Class Set Genera and the Origin of Modern Harmonic Species," *Journal of Music Theory* 32 (1988): 187-270; Deborah Mawer, *Darius Milhaud: Modality and Structure in Music of the 1920s* (Aldershot, England: Scolar Press, 1997); Richard S. Parks, *The Music of Claude Debussy* (New Haven: Yale University Press, 1989); idem, "Pitch-Class Set Genera: My Theory, Forte's Theory"; "Round Table: Response and Discussion"; and, "Afterword," in *Music Analysis* 17, no. 2 (1998): 206-226, 231-236, 237-240; Pieter C. van den Toorn, *The Music of Igor Stravinsky* (New Haven: Yale University Press, 1983).

[31] Allen Forte, *The Structure of Atonal Music* (New Haven: Yale University Press, 1973). See also, Robert Morris, *Composition with Pitch Classes* (New Haven: Yale University Press, 1987); John Rahn, *Basic Atonal Theory* (New York: Longman, 1980); Joseph Straus, *Introduction to Post-Tonal Theory* (Englewood Cliffs, New Jersey: Prentice Hall, 1990).

relationships of sc inclusion examined for their own significance, but these relationships are then re-examined in light of their generic characteristics. Consequently, the analytical methodology, through its reliance on pc set theory in combination with pc set genera theory, serves to demonstrate that relationships between pc sets and pc set genera work together in forging coherent, large-scale structures within each of the three movements.

Since theories of pc set genera are a relatively new phenomenon, the following discussion will present an examination of the salient points of pc set genera theory invoked in this study. The most comprehensive theories to date have been advanced by two North American theorists, Richard S. Parks and Allen Forte.[32] Although this study favors Parks's theory over Forte's, similarities as well as differences between the two theories will be examined briefly in order to illustrate some of the basic concepts and goals that underlie theories of genera.

In the introduction to "Pitch-Class Set Genera: My Theory, Forte's Theory," Parks provides a concise summary in which he outlines the premise behind theories of genera; he states:

> Theories of pitch-class set genera proceed from the general premise that within the larger universe of 208 pitch-class set-classes that fill the range of from three to nine elements, smaller sub-groups may be identified—that is, *genera*—whose members evince a markedly higher degree of structural relatedness than is the case for the universe as a whole. Moreover, these genera are also distinguishable one from another by marked differences in their structural attributes.[33]

Ultimately, pc set genera are determined on the basis of sc inclusion. However, it is the differences in the structural attributes of particular genera that provide insight into the

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[32] Richard S. Parks, *The Music of Claude Debussy*, and idem, "Pitch-Class Set Genera: My Theory, Forte's Theory; Allen Forte, "Pitch-Class Set Genera."

[33] Parks, "Pitch-Class Set Genera," 206.

musical object(s) under consideration. In this way, pc set genera serve as theoretical models for the analyst: "I believe the fundamental object of both Forte's theory and mine—or, for that matter, any inclusion theory of pitch structures—is to facilitate modelling pitch structures in ways that render graspable, aspects of structure that are otherwise elusive."[34]

Before examining Parks's theory it is necessary to introduce specific terms that will provide us with a working vocabulary. The following definitions, taken from Parks (1998), may be referred to when needed as they provide the basis for the analytical discussions of pc set genera that follow:

> **Simple Genus**: A simple genus is a collection of scs related to a single cynosural sc by inclusion, as either subsets or supersets of that sc.
>
> **Primary Members of a Simple Genus**: Primary members of a simple genus are those scs that are either subsets or supersets of the cynosural sc.
>
> **Complex Genus**: A complex genus is a collections of scs that are related to two or more cynosural scs by inclusion, either as subsets or supersets of those cynosures. The complex genus comprises the *union* of the simple genera for each of its cynosural scs.
>
> **Primary Members of a Complex Genus**: Primary members of a complex genus are those scs that are either subsets or supersets of all of the cynosural scs. They constitute the *intersection* of the simple genera about each cynosural sc.
>
> **Secondary Members of a Complex Genus**: Secondary members of a complex genus are those scs that are either subsets or supersets of at least one, but not all, of the cynosural scs. The secondary scs of a complex genus correspond to the *difference* of the simple genera about each cynosural sc.

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[34] Ibid., 212.

> **Characteristic Members of a Genus**: Characteristic members of a genus are those scs of three to nine elements that meet the following criteria. They include the cynosural sc(s). As well, they should evince some or all of three qualities: (i) they are all subsets or supersets of each other (except for the cynosural scs themselves, which may or may not be inclusion related); (ii) within their interval vectors, they display some uniformity in patterns of interval-class (ic) distribution; (iii) within their successive interval arrays, they display some uniformity in interval patterns.[35]

The principle difference between Parks's theory and Forte's is reflected in each author's approach to genera formation. Forte's theory operates within a closed system of twelve predetermined genera and four "supragenera," whose members are determined by particular relationships of sc inclusion about trichords—relationships that necessarily restrict the number of genera to twelve while also limiting the number of scs holding membership in any one genus.[36] Parks's theory, on the other hand, does not restrict genera formation to genera involving trichords. Rather than presenting a system of predetermined genera, Parks provides a framework for the analyst to model individually the pitch structures of a given piece (or group of pieces) generically. As a result, the analyst is free to choose from an almost infinite number of generic possibilities.[37]

The key to Parks's theory, however, lies in the importance it places on "...ensuring a 'good fit' of genus-model to musical passage, on the one hand, and limiting the range of possible genera to a manageable number, on the other...."[38] In order to ensure that both of

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[35] Ibid., 207-208.

[36] Forte's twelve genera and the four supragenera are listed in his "Pitch-Class Set Genera," 264-266.

[37] The author is grateful to John Gray for allowing him the use of his computer program developed to facilitate the construction of pc set genera.

[38] Parks, "Pitch-Class Set Genera," 206.

these conditions are met, Parks offers four preference rules in addition to the six definitions presented above:

1. Prefer those genera that contain as members as many as possible (ideally, all) of the scs represented in the musical object that is the subject of investigation. Then, in no particular order of precedence:
2. Prefer that genus whose primary members or characteristic members embrace the largest number of scs from the musical object.
3. Prefer that genus which contains the smallest number of members or which contains the smallest number of primary members.
4. Prefer that genus whose cynosural and member scs evince the greatest similarity to familiar pitch constructs.[39]

These preference rules are particularly useful given the myriad of possibilities faced by the analyst and have proven invaluable when working through the pitch materials of the Sonata.

Perhaps the greatest advantage of Parks's theory over Forte's is that Parks's theory works towards ensuring "...a more immediate musical reference between otherwise abstract musical relations and musical objects,"[40] since the analyst is free to determine the cynosural sc(s) deemed most appropriate given its (their) relationship to the musical object under consideration.[41] By preferring that genus whose cynosural, member, and characteristic scs evince the greatest similarity to familiar pitch constructs (i.e., pitch constructs apparent in the musical object under consideration), the analyst is able to present a more persuasive analysis. Commenting on his own theory and that of Forte's, Parks offers the following analogy:

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[39] Ibid., 211.

[40] Ibid., 212.

[41] Parks's cynosural scs correspond to Forte's trichordal "progenitors" used to generate the twelve genera. See Forte, "Pitch-Class Set Genera," 190-192.

I propose that there is a choice between two theories that require quite different approaches to modelling. I have a mental image of their differences that goes as follows. One theory is like opening a closet with twelve templates sitting on its shelf.... No template fits exactly but several come close. The other theory is like opening a closet that is so packed full of templates that they burst out, cascading off the shelves knocking the investigator to the ground...the investigator knows that somewhere in that heap of templates exists one or more which will fit *exactly*, or nearly so...if only she can find it. Either way, the investigator will have to explore carefully both the relationship between model and object and the nature of templates as models....[42]

[42] Parks, "Pitch-Class Set Genera," 213.

CHAPTER 2

THE FIRST MOVEMENT OF THE SONATA FOR PIANO (1926)

Form

In his book *Remaking the Past: Musical Modernism and the Influence of the Tonal Tradition* Joseph Straus observes that the first movement of the Sonata represents Bartók's "first essay in Sonata form."[1] Given the title of Straus's book, the author's description of the movement may seem contrived; however, many authors including Paul Wilson, Michael Konoval, and David Burge, have also chosen to describe the first movement's formal scheme in terms of sonata form.[2]

Contemplating the Sonata as a whole, Konoval posits that in choosing the title *Sonata* for Piano "...the composer acknowledges some intent to address the history and associated meanings of the term."[3] While this assumption may seem appealing, the present study will not attempt to address issues of historical intention. Although a traditional sonata-form scheme will be invoked—demonstrating that the movement can be appreciated as a three-

[1] Straus, *Remaking the Past*, 107.

[2] Wilson, *The Music of Béla Bartók*, 55-71; Konoval, "An Analytical Study," 18-58; David Burge, "Bartók's Sonata for Piano," *Contemporary Keyboard* 14, no. 1 (1988): 104.

[3]Konoval, "An Analytical Study," 18.

part structure evincing expositional, developmental, and recapitulatory characteristics respectively—the ways in which thematic materials are presented (and related) will not be considered directly in terms of *tonal*, sonata-form musical structures.

However, before introducing a detailed formal plan of the movement it is necessary to acknowledge the problems associated with using a sonata-form design in the absence of tonal hierarchical structures. Although the sonata-form paradigm works well given the movement's thematic organization, there are a number of important limitations. Among these is the movement's lack of a traditional thematic key scheme and harmonic closure. Keeping these limitations in mind, the following discussion of form will serve to demonstrate the appropriateness of using the sonata-form paradigm as a model. Moreover, in the following sections of this chapter, pitch-structural relationships with respect to formal divisions (in combination with motivic-thematic associations) will be examined in an effort to address the notion of a thematic key scheme from a post-tonal (pc set-generic) perspective.

Figure 2.1 demonstrates the formal scheme of the first movement. The exposition's first theme is stated and developed in mm. 1-37.[4] Although I retain the familiar term *theme*, due to its short three-note duration and its subsequent relationship to other thematic material the first theme is perhaps best described as a three-note melodic motive (see example 2.1). Moreover, given that the motive permeates the movement, as the following thematic analysis will demonstrate, for the purposes of this study the term "first theme" also represents a formal subdivision that is characterized by its particular saturation with the motive.

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[4] While illustrations, where necessary, have been provided, it is recommended that the reader consult a complete version of the score.

Figure 2.1. Formal scheme of the first movement

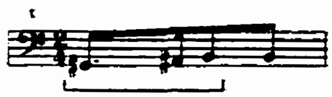
Exposition first-theme area	transition	second-theme area				
mm. 1-37	mm. 38-43	theme A mm. 44-56	theme B mm. 57-75	theme C mm. 76-92 & mm. 93-115	theme D mm. 116-125	theme E mm. 126-134

Development		
1st theme/2d theme (E) mm. 135-154	2d theme (A) mm. 155-171	2d theme (D) mm. 172-185 with 1st theme mm. 176-186

Recapitulation			
1st theme mm. 187-210	2d theme (C) mm. 211-223 with 1st theme mm. 217-219	1st theme mm. 222-233	2d theme (E) mm. 233-235

Coda	
RH: 2d theme (E) LH: 1st theme mm. 236-246	2d theme (C) mm. 247-268 with 1st theme mm. 250-268

Example 2.1. Opening motive



The First-Theme Area

The first 37 measures of the movement represent a distinct formal segment of the exposition (the introduction and development of the principal melodic motive). This is made clear by a number of surface musical features. For example, in mm. 2-35 the left hand (LH) primarily fulfills an accompanimental (chordal) role by maintaining a rhythmic ostinato of eighth notes. In contrast, in mm. 1-35, the right hand (RH) presents and develops the opening three-note motivic gesture.[5]

As figure 2.1 indicates, mm. 38-43 represent a transition between the first and second themes. I should note that my interpretation of mm. 38-43 diverges from both Wilson's and Straus's. Straus dismisses the possibility of a transitional passage, indicating that the first theme occupies mm. 1-43.[6] Wilson, on the other hand, suggests that a transition does in fact take place; however, he places the transition in mm. 36-43.[7]

Presumably, Wilson has chosen to incorporate mm. 36-37 into the transition because of the specific pitch significance of these measures in relation to the opening statement of the second-theme area. Ironically, although Wilson does not mention such a relationship in

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[5] The three-note motive also appears in a harmonic context and will be discussed in the following section under the heading "Pitch-Class Set Relations."

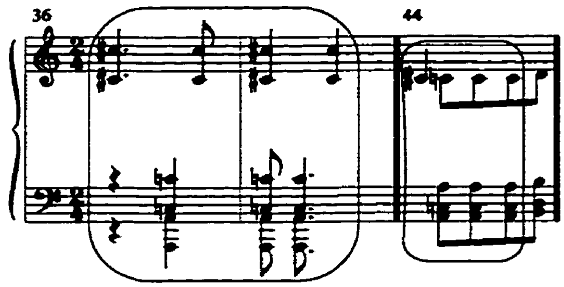
[6] Straus, *Remaking the Past*, 107.

[7] Wilson, *The Music of Béla Bartók*, 56.

his analysis, Straus, who does not identify a transitional passage, does. He notes that: "After an arresting hint in measures 36-37, the second theme proper begins in measure 44...."[8]

The "arresting hint" to which Straus refers can been seen in example 2.2 in which the pc content of mm. 36-37 is identical to the opening three chords of the second theme, beginning in m. 44. While I acknowledge that such a relationship exists, I have suggested that the transition does not occur until m. 38 for a number of reasons.

Example 2.2. Pc content of mm. 36-37 and m. 44



In the first instance, the dense texture of mm. 36-37 (three parts plus three octave doublings), which brings the first theme to a close, is suddenly juxtaposed with the contrasting two-voice texture of the transitional passage, beginning in m. 38. Moreover, the *sforzando* markings in the RH of mm. 36-37 stand in dramatic contrast to the *piano* marking of the opening motive in mm. 38-43 and that of the accompanimental chords in the LH. In addition, the decelerated attack rhythm in mm. 36-37 (from eighth notes and sixteenth notes before m. 36 to quarter notes and eighth notes after) serves to signal an impending formal boundary. And, finally, that Bartók has returned to the original rhythmic pattern of the opening motive (♩.♬), as a kind of final gesture before the onset of the second theme, in my view supports the position that mm. 38-43 are transitional.

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[8] Straus, *Remaking the Past*, 109.

The Second-Theme Area

The second-theme area is much longer than that of the first. While the first theme was stated and developed over the course of 37 measures, the second-theme area encompasses 91 (mm. 44-134). Although the second-theme area is longer, and exhibits greater melodic and harmonic scope than the first, its themes can be directly connected to the opening motive and this feature lends the movement a kind of large-scale thematic unity. Before illustrating specific examples, it is useful to consider observations that others have made concerning unity within the movement. Although Wilson does not discuss relationships of thematic unity in detail, he observes that: "The themes of the second group have an evolutionary quality, so fluidly does each seem to grow from its precursor."[9]

In keeping with Wilson's observation, Konoval demonstrates a relationship between the opening portion of the second theme (labeled theme A in figure 2.1) and a prominent secondary thematic statement, beginning at m. 57 (labeled theme B in figure 2.1; see example 2.3). Konoval compares the opening melodic statement of the second theme, involving the pcs C and D, to the material presented in the RH in m. 57, which focuses on pcs C♯ and D♯. He draws a further connection between the inner-top voice in m. 57, and the top voice in m. 79, both of which emphasize the pcs G♯ and A♯. The connection is that the pc contents of all three statements are related by transposition. The outer voices of m. 57 reflect a transposition of m. 44 (by T_1), and m. 79 reflects a transposition of the outer voices of m. 57 by T_7; the inner-top voice at m. 57 foreshadows this T_7 transposition.[10]

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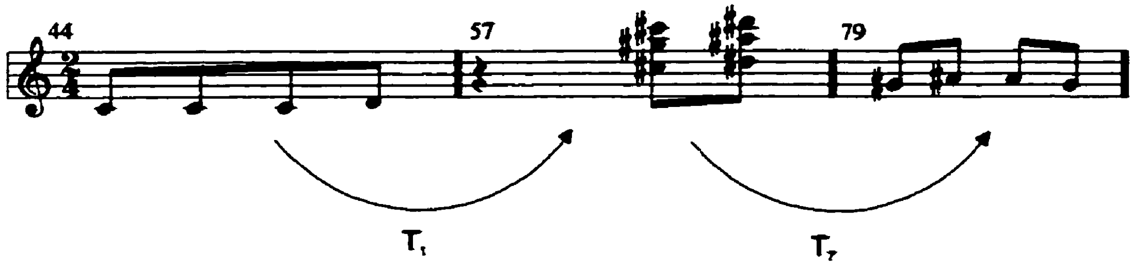
[9] Wilson, *The Music of Béla Bartók*, 55.

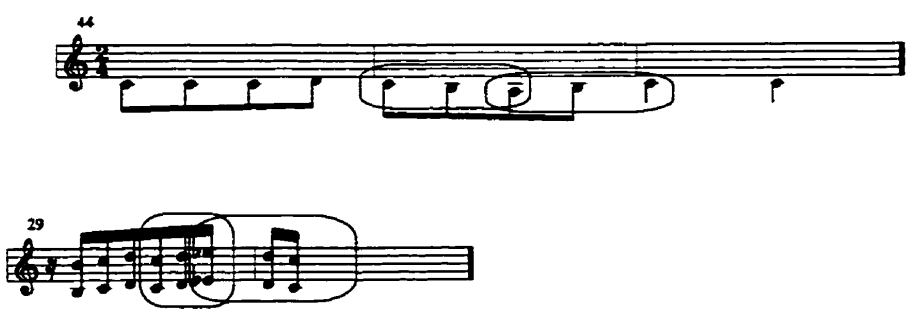
[10] Konoval, "An Analytical Study," 38-40.

Example 2.3. Thematic connections (through transposition) between mm. 44, 57, and 79



While these observations concerning thematic relationships within the second-theme area are certainly valid, a connection between secondary thematic statements can also be drawn in relation to the opening motive. For instance, as example 2.4 demonstrates, the second-theme area's opening statement, which emphasizes the pcs <C-D-C-B-A-B-C>[11] (mm. 44-46), resembles Bartók's developmental treatment of the opening motive in mm. 29-30. Interlocking statements of the transposed motive (in ascending and descending formations) are clearly contained within both statements: <C-B-A> and <A-B-C> in mm. 45-46, and <C-D-E♭> and <E♭-D-C> in mm. 29-30.

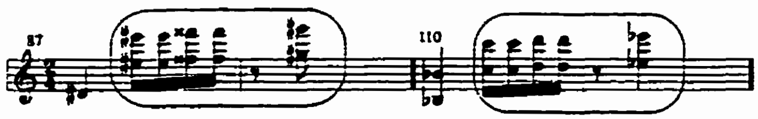
Example 2.4. Motivic-thematic connections between mm. 45-46 and 29-30



[11] Pitch-classes enclosed in angle brackets (<>) represent ordered pc sets.

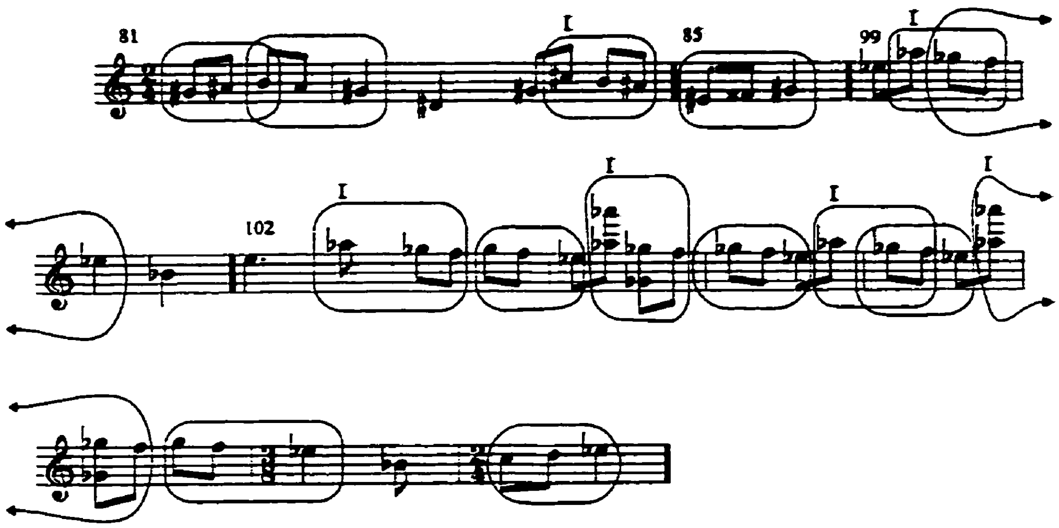
Perhaps, however, the most significant connections between the second-theme area and the opening motive occur in mm. 76-111 (theme C). Throughout these measures a number of references to the opening motive are made, some more explicit than others. Two of the most direct motivic references occur in the top voice in mm. 87-88, and mm. 110-111 (see example 2.5). Each time, the motive is stated in ascending form and, in both instances, it is set-off dynamically, rhythmically, and registrally from the rest of the music. In mm. 87-88, the first two pitches of the motive are stated as four sixteenth notes (two per pitch), while the final pitch (an eighth note) follows an eighth rest (𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅯 𝄾 ♪). This rhythmic pattern, which provides an additional source of emphasis, remains the same in mm. 110-111 except that the final note receives a quarter-note value (𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅯𝅘𝅥𝅯 𝄾 ♩).

Example 2.5. Motivic references in mm. 87-88 and 110-111



Numerous references to the opening motive (in ascending and descending formations) are also concealed within theme C (see example 2.6). For instance, during theme C's first statement, in mm. 81-82, two interlocking presentations of the motive, involving the pcs <G♯-A♯-B> and <B-A♯-G♯>, are followed by two separate presentations of the motive: the first involving the pcs <C♯-B-A♯> (m. 83), in which the motive appears intervallically inverted as <2-1> rather than <1-2>, and the second involving the pcs <E♯-F𝄪-G♯> (m. 85). Additional interlocking presentations of the motive also occur during the second statement of theme C, in mm. 99-100, involving pcs <A♭-G♭-F> (inverted) and <G♭-F-E♭> respectively. And finally, in mm. 102-109, nine additional statements of the motive are presented. Motivic references appearing as intervallic inversions have been identified in example 2.6 with the letter "I."[12]

Example 2.6. Motivic references concealed within theme C



Remaining Formal Sections

This section will conclude with a brief examination of the remaining formal sections. The intent of this examination is to clarify why I made particular choices regarding formal divisions. For example, the development section, which begins at m. 135, is made clear, in part, by the observation that new thematic material is not formally introduced. Of course,

12 Descending forms of the motive whose ordered interval contour is <1-2> have not been identified as inversions since these forms of the motive necessarily invert the motive's intervals.

the fact that previously presented thematic material is developed in m. 135-186 also aids in establishing m. 135 as a formal boundary. It is the placement of the recapitulation, however, which perhaps requires further explanation. While numerous interjections of the opening motive precede the actual recapitulation at m. 187, it is only at m. 187 that the LH returns to the opening eighth-note ostinato. Moreover, it is only at m. 187 (as opposed, for example, to m. 176, which may be heard initially as a "false recapitulation"), that the motive is re-introduced at a familiar level of transposition, with respect to the motivic statement beginning on the last beat of m. 13.[13] And finally, the arrival of the coda at m. 236 is implied by the instruction *Più mosso*. (The thematic and harmonic significance of the coda will be examined below).

Pitch-Class Set Relations

Just as we traced the motivic and thematic material against the background of form, now we will explore pc set relations against that same background. However, while the previous discussion focused on the similarities between the first- and second-theme areas from a motivic point of view, this section will concentrate on the pitch materials of the first and second themes in order to highlight their differences. In so doing, it will be shown that formal divisions—originally made apparent by surface musical features (as examined in the previous section)—are also supported by pitch-structural relationships. The discussion will begin with an analysis of the first-theme area and the significant scs embodied therein. Following this, consideration will be given to the significant scs of the second-theme area.

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[13] It is interesting that Bartók does not re-introduce the motive beginning on G♯, which begins the movement in the RH at m. 1, as one might expect.

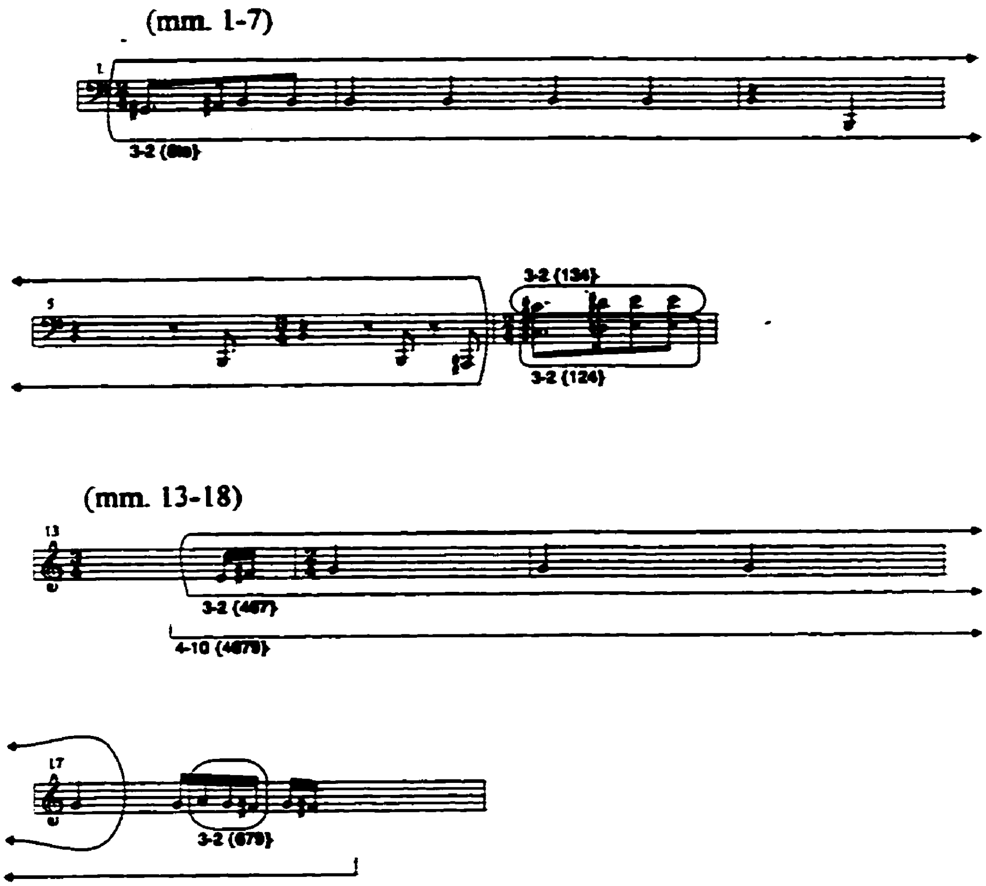
Relationships among the scs of each theme will be considered, as will the degree of interconnection among the scs through an examination of their respective inclusion relations. An examination of the pitch materials of the entire movement is presented in the final section of this chapter under the heading "Pitch-Class Set-Generic Relations."

The First-Theme Area

In order to initiate a discussion of the first-theme area's pitch materials, example 2.7 presents a motivic catalog and segmentation of the opening motive. [14] The example illustrates that the motive undergoes melodic, as well as rhythmic development. Because the motive is developed melodically, through figuration, the resulting tetrachords (forms of sc 4-10, {4679} and {0235} in mm. 13-18 and 31-35 respectively, and a form of sc 4-3 {e023} in mm. 26-30) demonstrate a concrete connection with the motive. This is because contained within each of the forms of sc 4-10, {4679} and {0235}, are two intervallically inverted forms of the motivic sc 3-2. Similarly, two intervallically inverted forms of sc 3-2 are also contained within the form of sc 4-3 {e023}, presented in mm. 26-30. These relationships of sc inclusion are, of course, literal as is reflected in the segmentation; however, they demonstrate the degree to which the first theme represents a formal subdivision that is characterized by its particular saturation with the motive.

[14] Set-class names correspond to Forte's list of pc sets as they appear in "Appendix 1" of *The Structure of Atonal Music*, 179-181. Integers that appear enclosed in curly brackets {} indicate a particular set's normal order where t=10 and e=11.

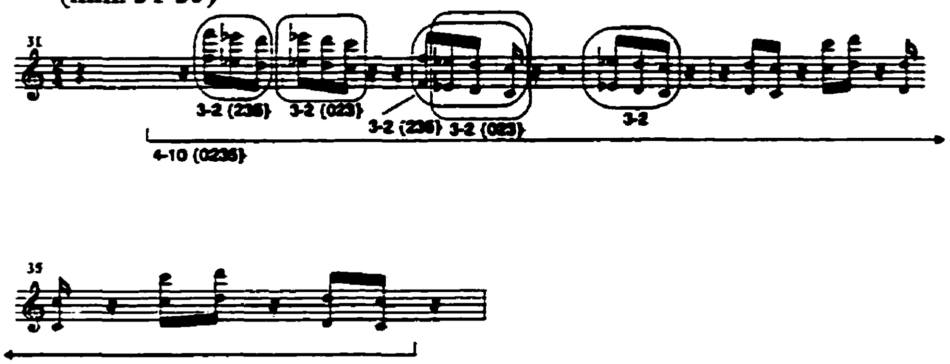
Example 2.7. Motivic catalog and segmentation of the opening motive



Example 2.7 (continued)

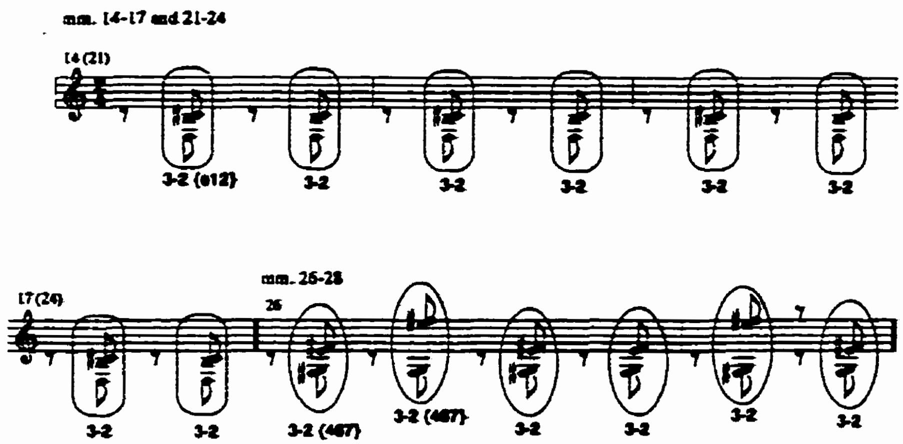
(mm. 26-30)

(mm. 31-35)



Motivic relationships between melodic and harmonic materials also present themselves within the first-theme area. For example, while the opening motivic gesture is developed melodically in mm. 14-28, forms of sc 3-2 are also presented harmonically. The trichord receives expression as {e12} in mm. 14-17 and 21-24, and {467} in mm. 26-28 (see example 2.8)

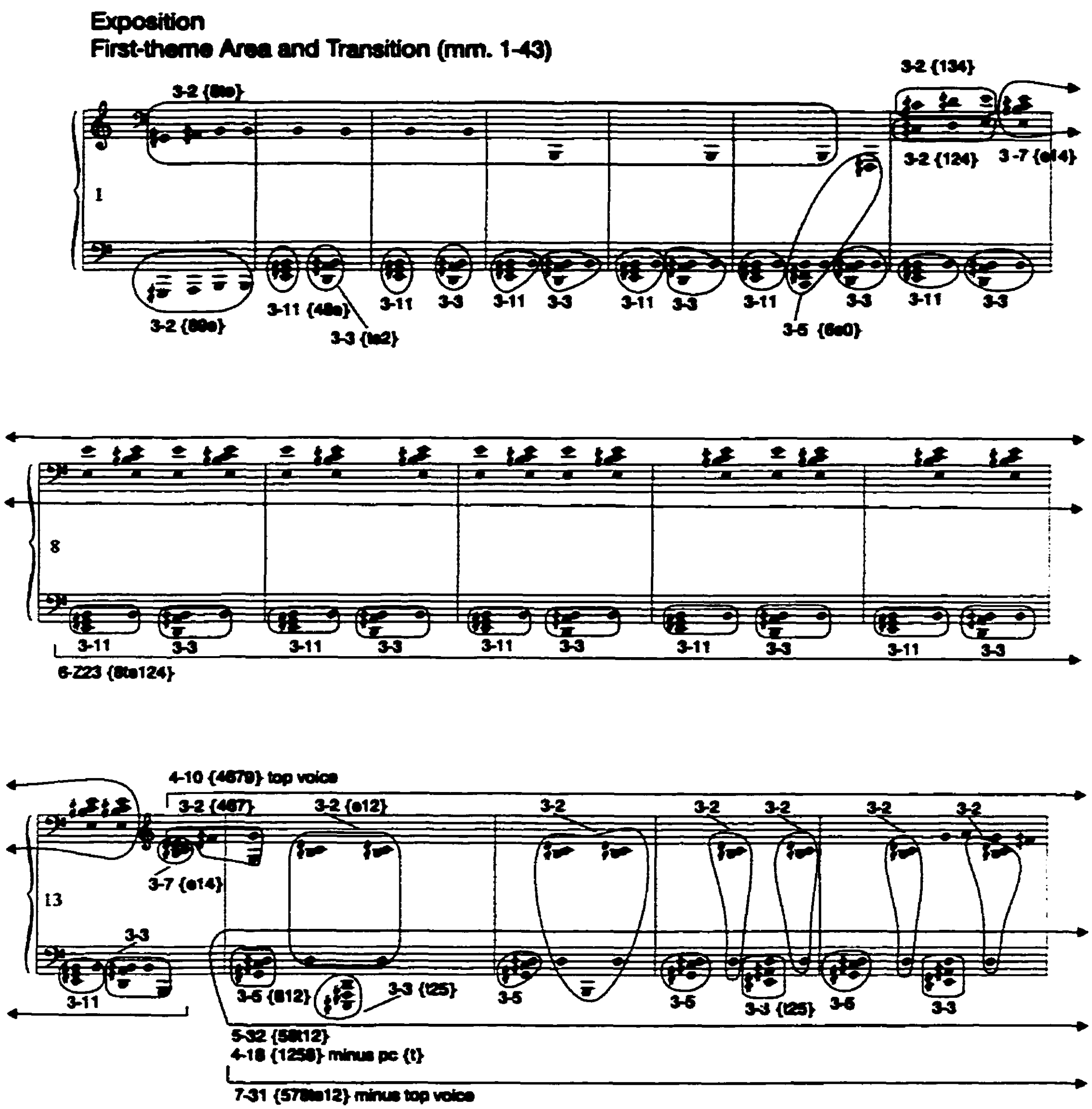
Example 2.8. Forms of sc 3-2 presented as a harmonic trichord



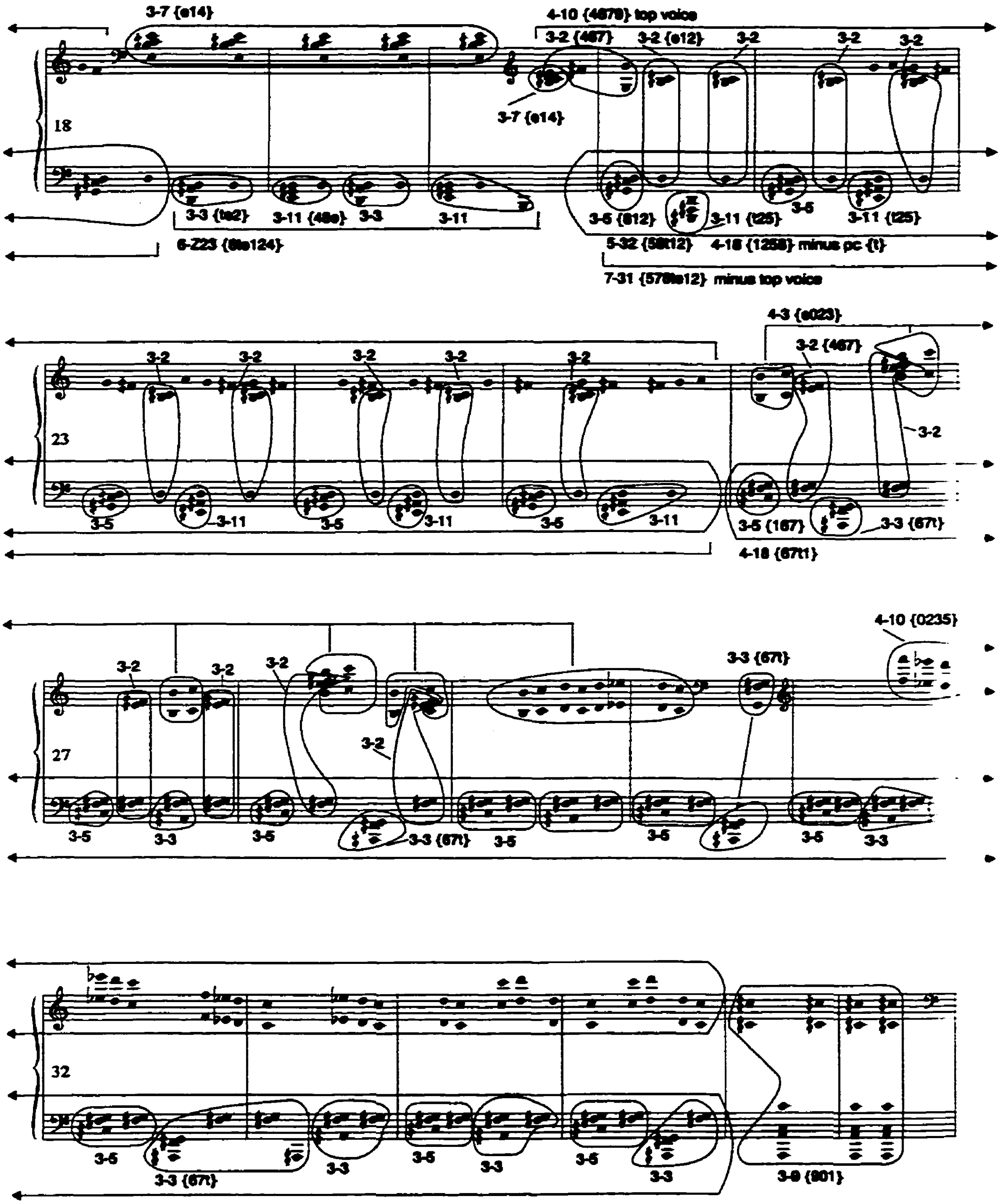
Although inclusion relationships between significant scs within the first theme have already been demonstrated above (involving forms of scs 3-2, 4-3, and 4-10), a subsequent examination of inclusion relationships among a comprehensive sc inventory of the first-theme area (involving scs 3-2, 3-3, 3-5, 3-7, 3-11, 4-3, 4-10, 4-18, 5-32, 6-Z23 and 7-31) also proves to be advantageous. A pitch reduction and segmentation of the first-theme area (and transition)—from which the eleven scs identified above have been extracted—is presented as example 2.9. My segmentation strategy (with the exception of a form of sc 4-18 {1258} examined below) is rooted in primary segments; that is, segments defined by their surface gestural and motivic associations.

Of the five trichords identified, four account for the material of the opening motive and the LH's harmonic accompaniment in mm. 2-43. For example, forms of scs 3-11 {48e} and 3-3 {te2} predominate, in alternation, in mm. 2-13. The remaining trichord, a form of sc 3-7 {e14}, presented by the RH in mm. 7-13 and mm. 18-20, serves to link varied restatements of the opening motive in mm. 13-18 and mm. 20-25. In addition, forms of scs 3-2 {t01}, 3-3 {te2}, and 3-11 {48e} account for the material of the transition in mm. 38-43.

Example 2.9. Pitch reduction and segmentation of the first-theme area and transition

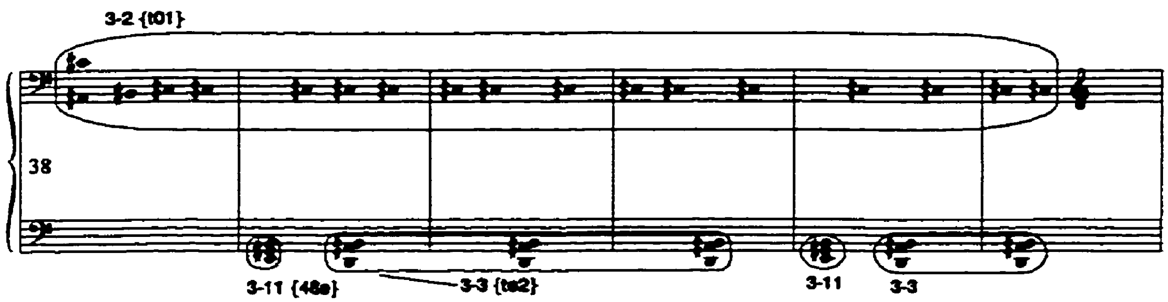


Example 2.9 (continued)



Example 2.9 (continued)

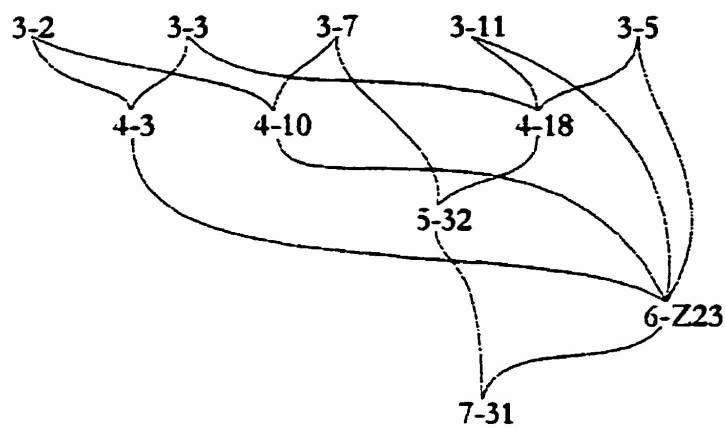
Transition (mm. 38-43)



Of the three tetrachords identified, the only sc not yet mentioned is 4-18. A form of this sc is presented as a composite segment, in the LH in mm. 26-35, involving the pcs {67t1}. An additional form of this sc {1258} is also presented as a composite segment in the LH in mm. 14-18 and mm. 21-25. As example 2.9 indicates, this form of sc 4-18 {1258} is only present when pc {t} is excluded from the pc content of these measures. Including pc {t} renders the set a form of 5-32 {8t125}. However, as we shall see in the final section of this chapter, both forms of sc 4-18, {1258} and {67t1}, prove significant, returning to provide harmonic support for a substantial portion of the coda (mm. 236-268). And, finally, the remaining scs, forms 6-Z23 {8te124}, and 7-31 {578te12} present themselves as composite segments: 6-Z23 involving both the LH and the RH in mm. 8-13 and 18-20, and 7-31 involving both the RH and the LH in mm. 14-18 and 21-25.

Figure 2.2 presents an inclusion matrix for the eleven scs that together constitute the sc inventory for the first-theme area and transition. The matrix effectively demonstrates that the scs are closely connected by means of inclusion. The degree to which they are connected is summarized at the bottom of table 2.1 in the form of a ratio expressed to four decimal places: 0.6904. The ratio is derived by dividing the total number of *actual* subset/superset connections (those illustrated in figure 2.2) by the ***maximum possible*** number of connections.[15] All scs of a given cardinality share the same number of possible connections. The number of possible connections for each cardinality is determined on the basis of sc cardinality in relation to the number of scs present in the matrix of less than and greater than cardinalities. For example, in table 2.1 all trichords could potentially (*possibly*) be related by inclusion to the 6 remaining scs of different (in this case larger) cardinalities: the 3 tetrachords, the pentachord, the hexachord, and the heptachord. This format and terminology is consistent throughout.

Figure 2.2. Inclusion matrix for the scs of the first-theme area and transition



[15] Actual connections refer to abstract inclusion relations, which may or may not be manifested by pc embeddings at the musical surface. In addition, actual inclusion relationships exclude null sets and self inclusion. Although the ratio of actual to possible connections is expressed to 4 decimal places, the ratio simply provides a means by which to qualitatively assess the abstract relationship between these two types of connections. The ratio appears in Parks's "Pitch-Class Set Genera."

Table 2.1. Ratio of actual to possible subset/superset connections among the scs of the first-theme area and transition

Scs	Actual	Possible
3-2	4	6
3-3	5	6
3-5	4	6
3-7	4	6
3-11	4	6
4-3	4	8
4-10	4	8
4-18	5	8
5-32	6	10
6-Z23	8	10
7-31	10	10
Total	58	84

Ratio = 0.6904

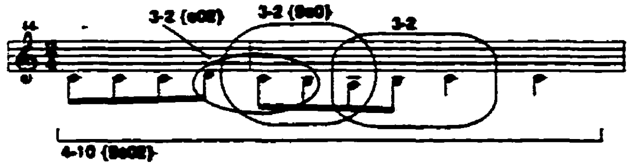
Not only are the scs of the first-theme area and transition connected by inclusion, but the eleven scs also share another important attribute, they are all subsets of the octatonic collection 8-28. The significance of sc 8-28 within the first movement, and its role as an important referential collection, will be examined in the section of this chapter entitled "Pitch-Class Set-Generic Relations."

The Second-Theme Area

Examination of the second-theme area will begin with a survey of the important scs involved in the presentation of the second-theme area's five distinct themes, labeled A through E in figure 2.1. These are presented in the form of a thematic catalog in example 2.10. Unlike the first theme's motivic catalog, in which only three scs were represented, the second theme's thematic catalog encompasses eight scs: 3-2, 4-10, 4-11, 4-14, 4-23, 5-23, 7-34, and 8-21.

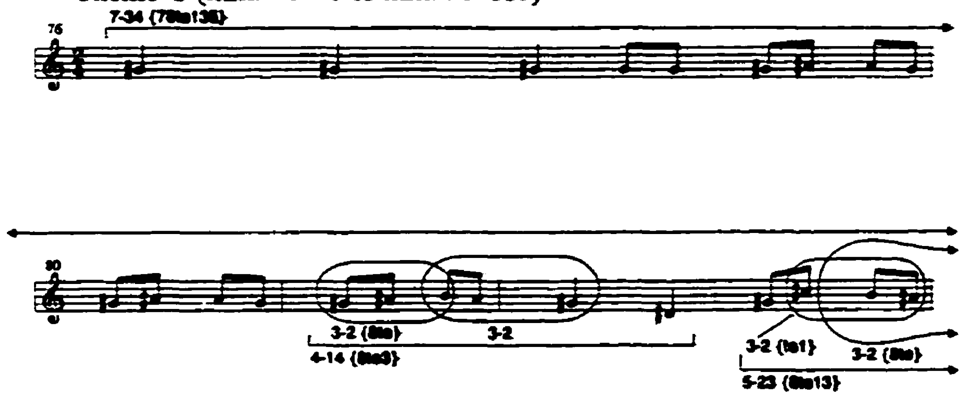
Example 2.10. Thematic catalog for the second-theme area

Theme A (mm. 44-46)

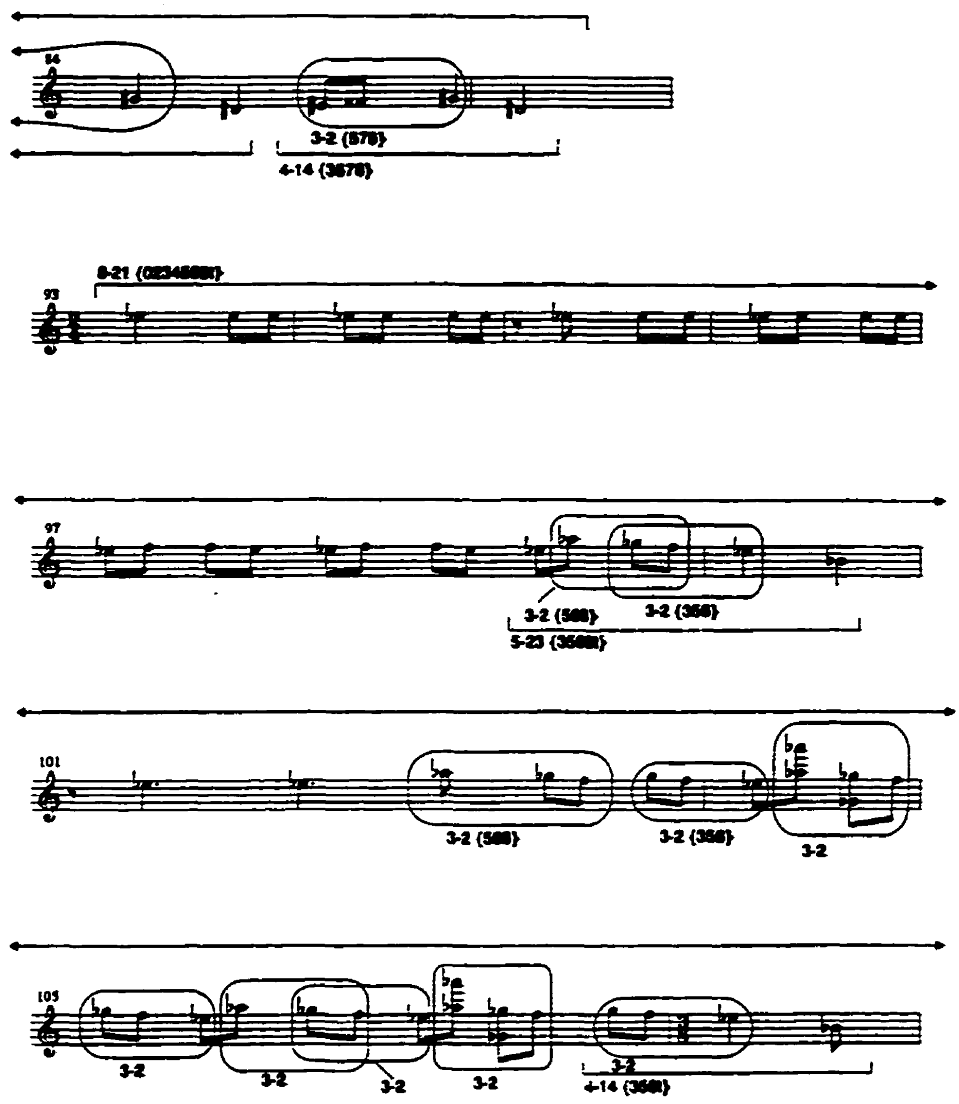


Theme B (mm. 57-59)

Theme C (mm. 76-86 & mm. 93-110)

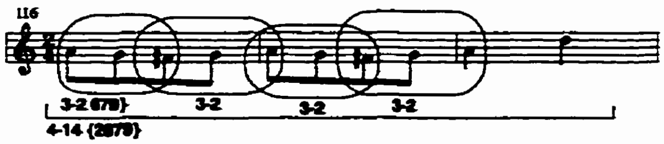


Example 2.10 (continued)

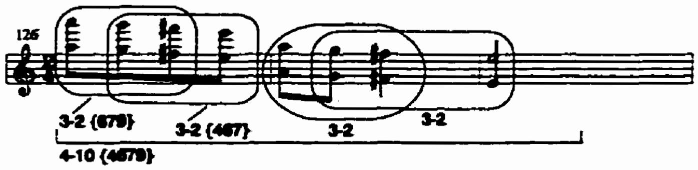


Example 2.10 (continued)

Theme D (mm. 116-118)



Theme E (mm. 126-128)



As figure 2.3 demonstrates, the scs represented by the second theme's thematic catalog are even more closely related to each other by means of inclusion than those of the first theme's scs. The high degree of interconnection among the scs is reflected in the ratio of actual to possible connections presented at the bottom of table 2.2: 0.9545.

Figure 2.3. Inclusion matrix for the scs of the second-theme area's thematic catalog

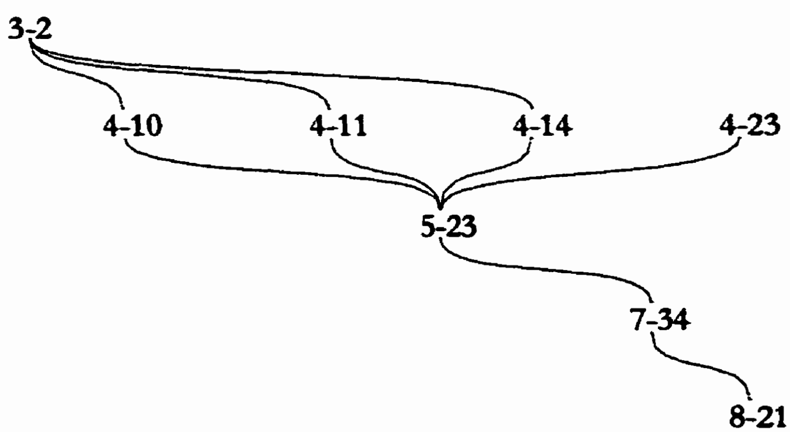


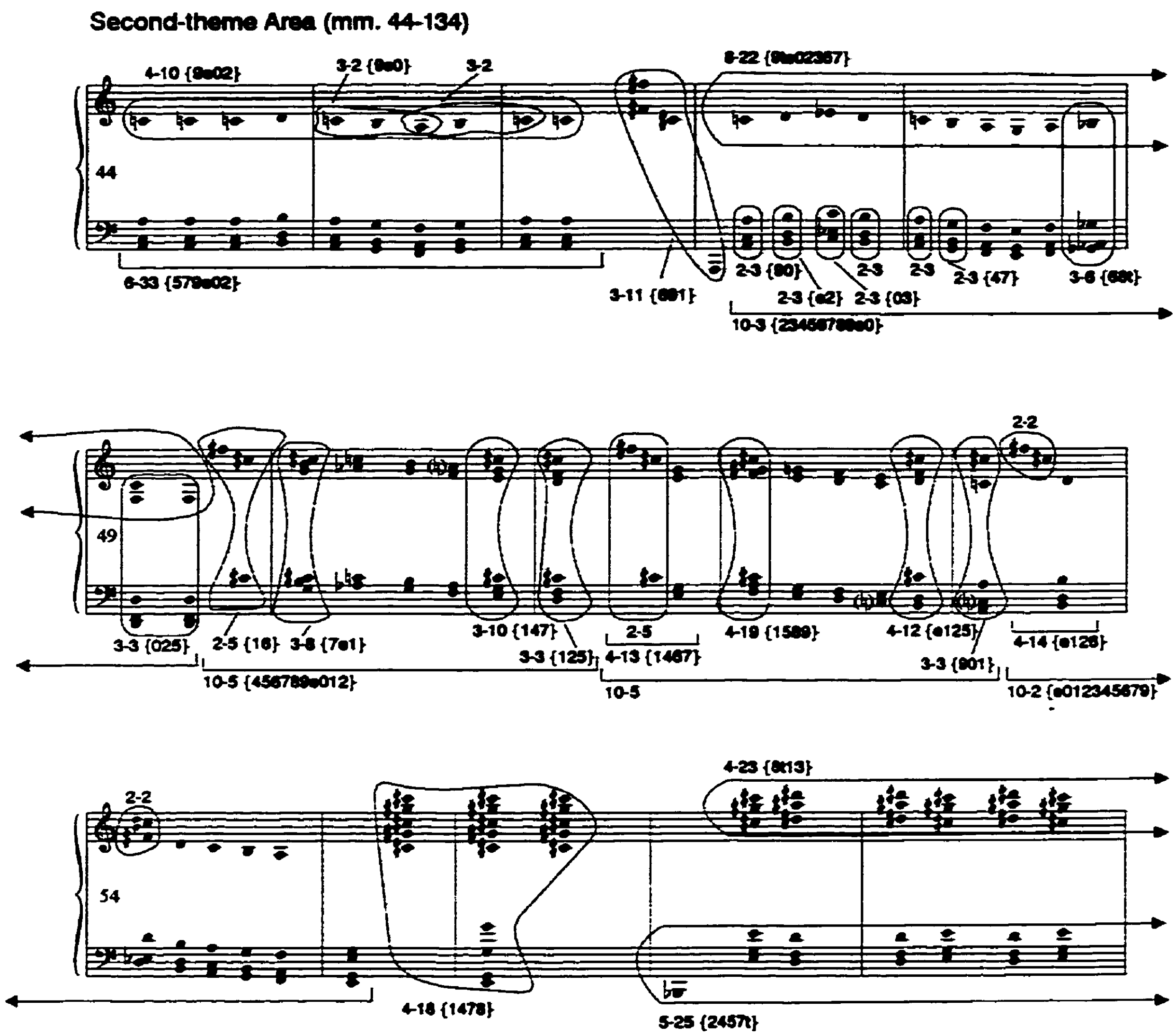
Table 2.2. Ratio of actual to possible subset/superset connections among the scs of the second-theme area's thematic catalog

Scs	Actual	Possible
3-2	6	7
4-10	4	4
4-11	4	4
4-14	4	4
4-23	3	4
5-23	7	7
7-34	7	7
8-21	7	7
Total	42	44

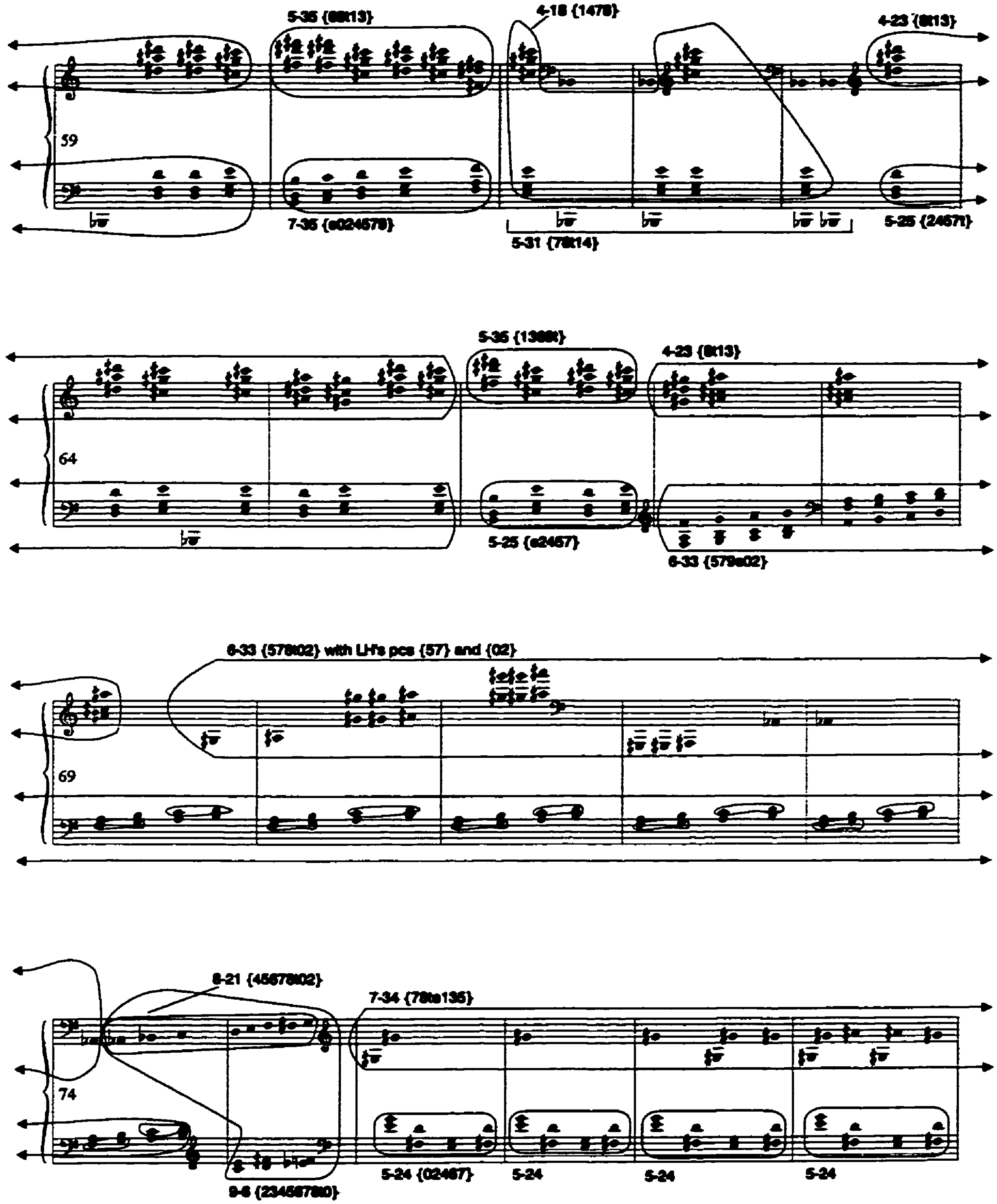
Ratio = 0.9545

Before proceeding to a consideration of pc set-generic relationships for the entire movement (the topic of this chapter's final section), it is necessary to present a sc inventory of the second-theme area. A pitch reduction and segmentation of the second-theme area appears below as example 2.11. Once again, my segmentation strategy relies on primary segments. However, an exception occurs in mm. 47-54 (see example 2.11). Since most of the vertical segments form dyadic sets (as a result of voice doublings), I have identified three decachords in mm. 47-54 as primary segments (forms of scs 10-3, 10-5, and 10-2). Although the ten-note sets represent primary segments, the two-note sets do not; rather, they represent secondary segments, which serve to demonstrate set-theoretical relationships of abstract complementation, with respect to the three decachords identified.

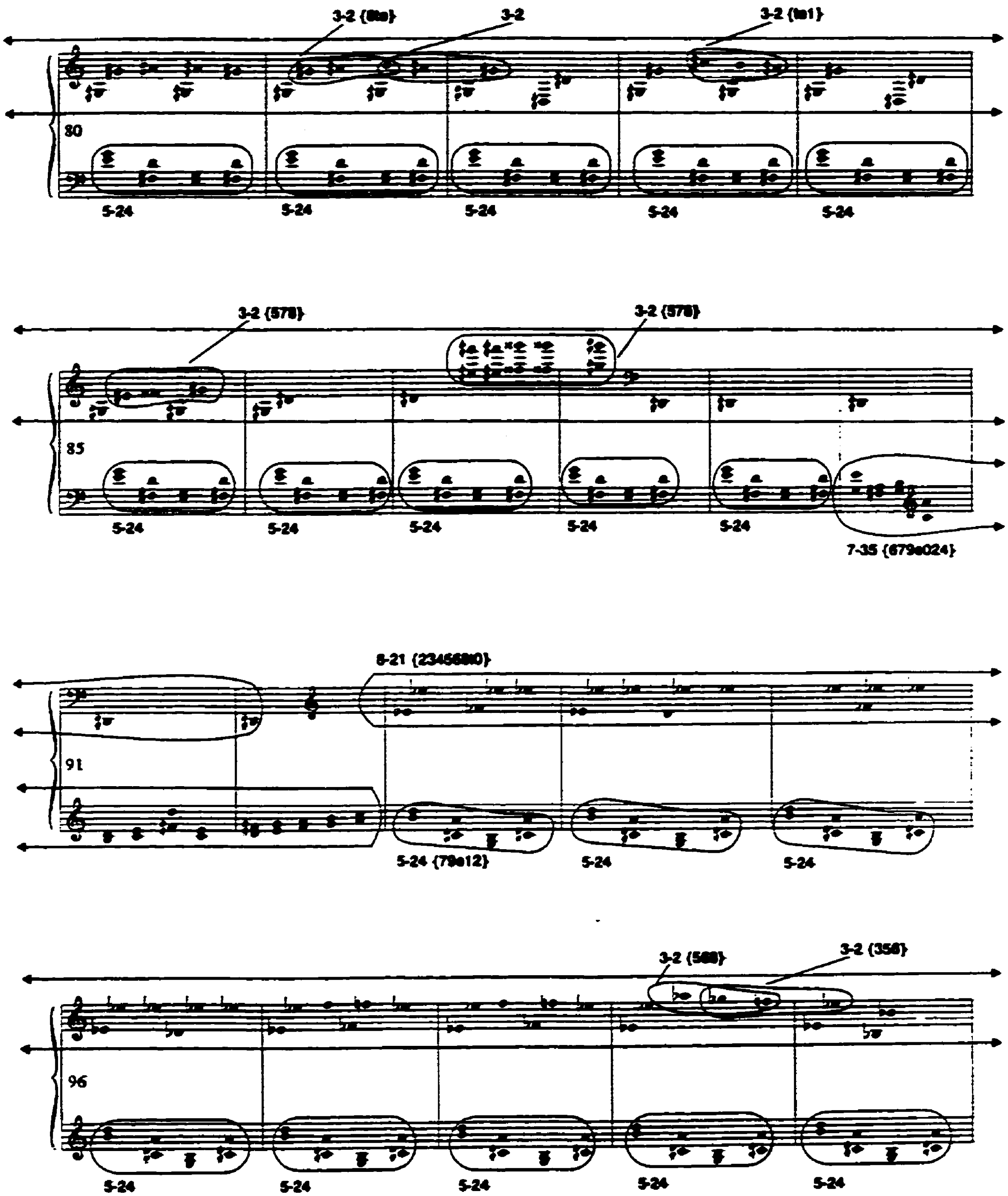
Example 2.11. Pitch reduction and segmentation of the second-theme area



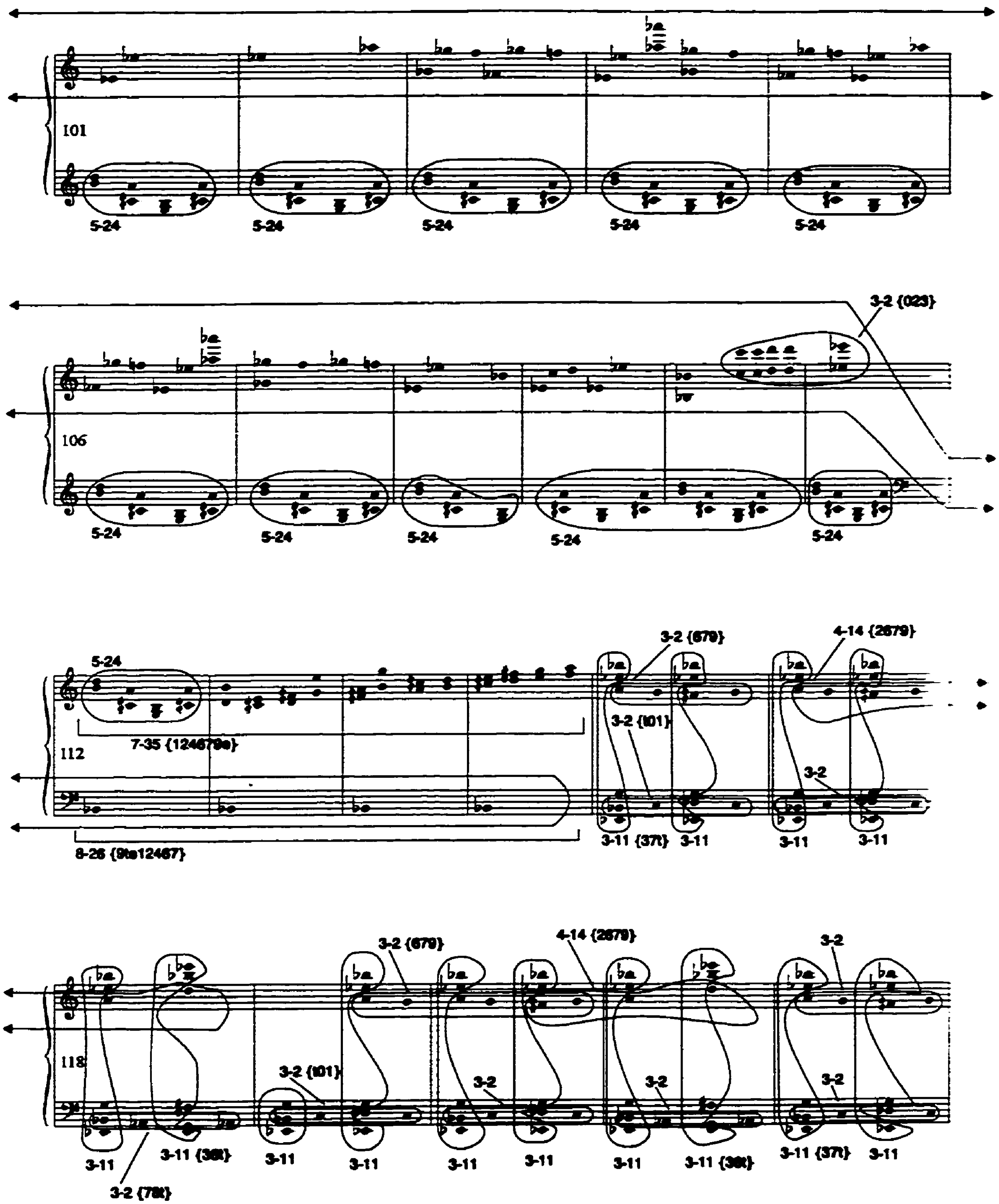
Example 2.11 (continued)



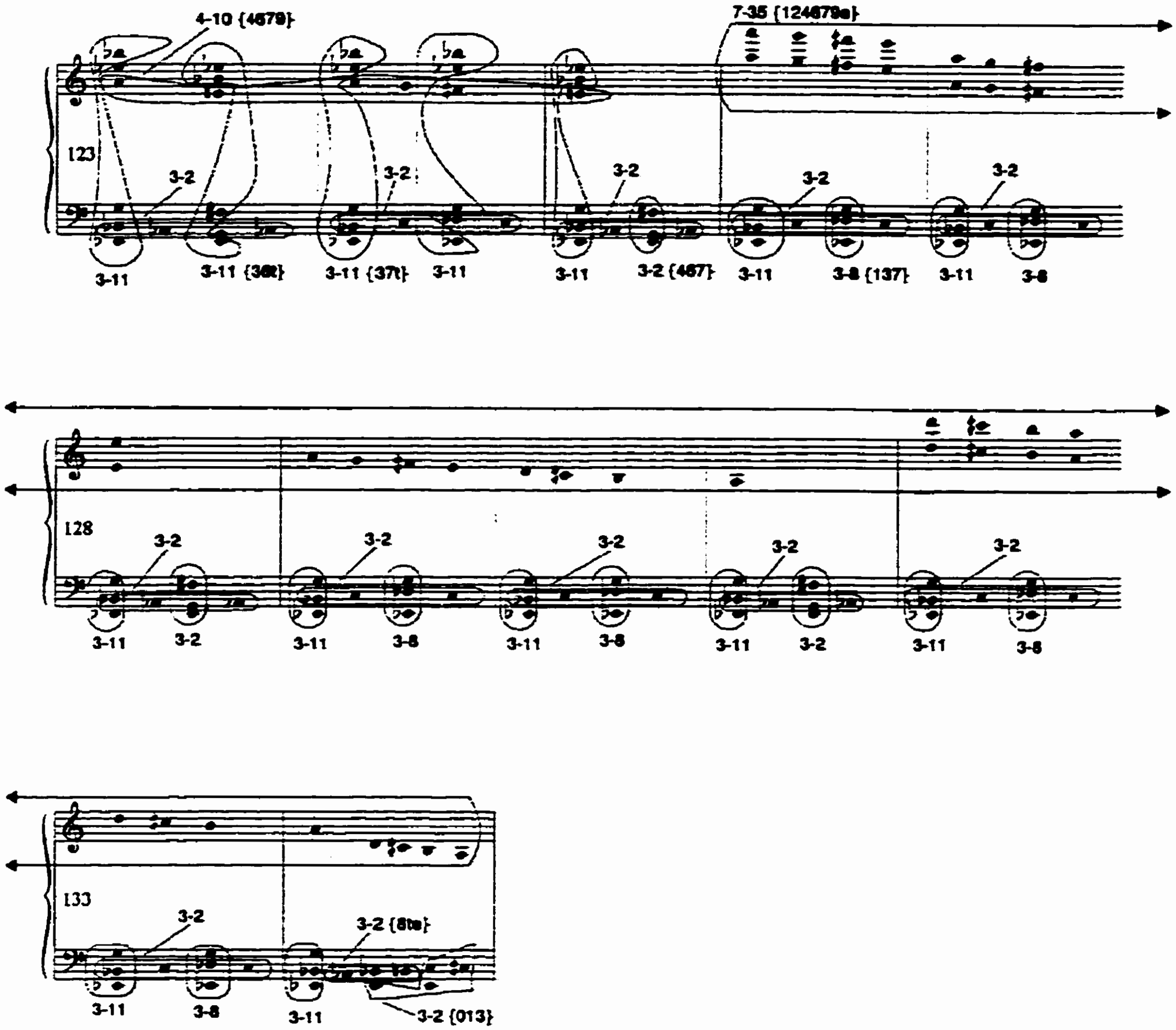
Example 2.11 (continued)



Example 2.11 (continued)

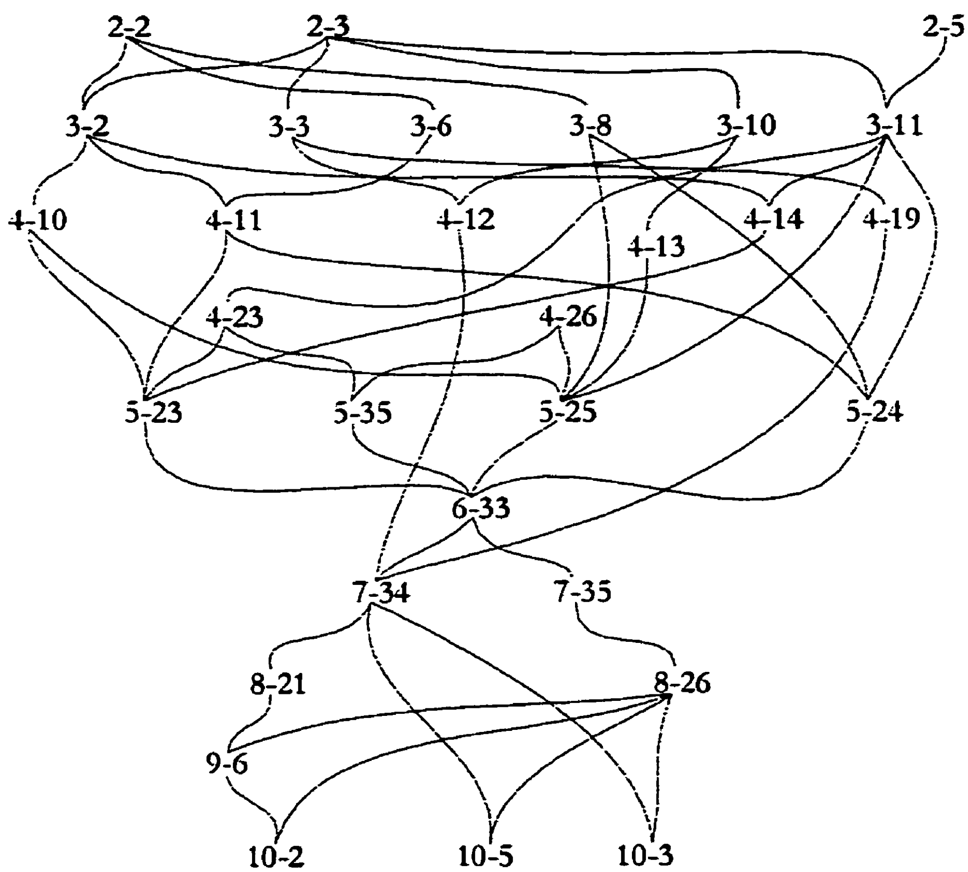


Example 2.11 (continued)



The degree to which the second-theme area's scs are interconnected by inclusion is greater than that of the first theme's scs. Figure 2.4 illustrates the interconnections among the scs in the form of an inclusion matrix, while table 2.3 illustrates the ratio of actual to possible connections: 0.7820. [16]

Figure 2.4. Inclusion matrix for the scs of the second-theme area



[16] The reader will note that the sc content of mm. 55-56 (sc 4-18) and mm. 61-63 (scs 4-18 and 5-31) has been excluded from the sc inventory displayed in figure 2.4 and table 2.3. For pc set-generic reasons—concerning a connection between these measures and the first-theme area—the sc contents of these measures will be addressed in the following section of this chapter. However, contextual reasons for excluding these measures can be offered. For example, the measures reflect a decelerated attack rhythm (from eighth notes and quarter notes to quarter notes and half notes) similar to the first-theme area's closing measures (mm. 36-37). In addition, these measures demonstrate a significant degree of registral disjunction in comparison with the surrounding measures.

Table 2.3. Ratio of actual to possible subset/superset connections among the scs of the second-theme area

Scs	Actual	Possible
2-2	23	26
2-3	25	26
2-5	21	26
3-2	19	23
3-3	10	23
3-6	14	23
3-8	13	23
3-10	13	23
3-11	18	23
4-10	15	21
4-11	16	21
4-12	13	21
4-13	15	21
4-14	15	21
4-19	11	21
4-23	14	21
4-26	15	21
5-23	19	25
5-24	17	25
5-25	19	25
5-35	16	25
6-33	26	28
7-34	27	27
7-35	24	27
8-21	25	27
8-26	26	27
9-6	26	28
10-2	27	27
10-3	27	27
Total	549	702

Ratio = 0.7820

Unlike the sc inventory of the first-theme area and transition, the scs of the second-theme area are not immediately recognizable as subsets or supersets of a single collection (e.g. the octatonic collection 8-28). However, two collections, 7-34 and 7-35, demonstrate a significant degree of inclusion among the scs of the second-theme area.[17] For example, as table 2.3 indicates, sc 7-34 is connected by inclusion to 27 out of 27 possible scs, while sc 7-35 is connected to 24 out of 27 scs. In addition, excluding the two- and ten-note scs (whose high degree of inclusion is not particularly significant given the comparatively large subset/superset inventories of dyad and decad collections), table 2.3 reveals that scs 6-33, 8-21, 8-26, and 9-6 contain the greatest number of subsets/supersets among the scs identified. These four scs, all of which are either subsets or supersets of one or both of scs 7-34 and 7-35, feature important pc set-generic dimensions that will be examined shortly.

Since sc 7-34 was represented in the thematic catalog of secondary themes presented above (theme C, mm. 76-86) and sc 7-35 was not, this section will conclude by examining the three presentations of sc 7-35 that occur within the second-theme area (see example 2.11). The first presentation involves a complement relation between the RH and LH at m. 60 in which the LH expresses a form of sc 7-35 {e024579}, and the RH expresses a form of its literal complement, sc 5-35 {68t13}. The event receives musical emphasis given that the RH and the LH move (predominantly) in contrary motion from their initial position of registral extremes to one of registral proximity.

The second presentation takes place in the LH in mm. 90-92. Leading up to these measures, the LH presents an accompaniment against the RH's presentation of theme C (which expresses a form of sc 7-34 {78te135}). Although the LH begins by presenting an ostinato figure in mm. 76-89 (a form of sc 5-24 {02467}), in mm. 90-92 the pc content of the LH is expanded to incorporate a complete form of sc 7-35 {679e024}. The final presentation also involves the LH in an ostinato figure that initially expresses a form of sc 5-

[17] The combined significance of these two scs will be addressed in the following section of this chapter by way of a complex genus about 7-34/7-35.

24 {79e12}, in mm. 93-111. At m. 112, the ostinato figure is transferred to the top staff. Then, in a manner similar to the preceding example, the pc content of mm. 113-115 (top staff) is expanded to incorporate a complete form of sc 7-35, this time expressed as {124679e}. Once again Bartók presents an accompaniment, initiated as a partial representation of sc 7-35 (in the form of an ostinato figure expressing 5-24), against the second presentation of theme C (mm. 93-115), whose combined pc content expresses a form of sc 8-21 {234568t0}, a superset of sc 7-34. These presentations are significant in that they demonstrate an important structural feature of the second-theme area: the simultaneous incorporation of significant referential collections, 7-35 and 7-34. This feature will be examined below in greater detail from the perspective of the second-theme area's pc set-generic associations.

In summary, not only are the scs of the first-theme area (and transition) closely related by means of inclusion, but so too are the scs of the second-theme area. As a result, the movement's formal divisions, with respect to the first- and second-theme areas, are also supported by pitch-structural relationships within the realm of sc inclusion, the pc set-generic implications of which are examined below.

Pitch-Class Set-Generic Relations

The previous sections of this chapter have focused on the movement's formal plan from two main perspectives: motivic-thematic connections and pc set-theoretic relations, concentrating in particular on relationships of sc inclusion. The purpose of this examination has been twofold: to demonstrate that relationships between structural features of the movement's musical surface and the pitch-structural relationships underlying that musical surface were in agreement, and to prepare the way for a comprehensive examination of the movement's pc set-generic relations. Having already examined the pitch materials of the first- and second-theme areas in some detail, this section will continue that examination while also focusing on pc set-generic relationships apparent within the movement as a whole.

The First-Theme Area and Transition

As has already been demonstrated, the scs of the first-theme area and transition are closely related by means of inclusion. In addition, all of the scs identified are subsets of the octatonic collection 8-28. As a result, the simple genus 8-28 serves as an effective means by which to model the pitch materials of the first-theme area and transition. The member scs of simple genus 8-28 are presented below in table 2.4.

Table 2.4. The simple genus 8-28[18]

Simple Genus 8-28 (44 scs)		
Cynosural Sc	Counts	Ordinal Number/Number of Forms
8-28		
2	6	1/4 2/4 3/8 4/4 5/4 6/4
3	7	[illegible] [illegible] [illegible] [illegible] 8/8 10/8 [illegible]
4	13	3/[illegible] 9/2 10/[illegible] 12/8 13/8 15/8 17/4 18/[illegible] 25/2 26/4 27/8 28/2 29/8
5	7	10/8 16/8 19/8 25/8 28/8 31/8 32/[illegible]
6	6	13/4 2[illegible] 27/8 30/4 49/4 50/4
7	1	31/[illegible]
8	1	28/1
9	1	10/4
10	2	3/4 6/2
Total	44	

[18] The layout of table 2.4 is as follows. The first column under the cynosural sc label indicates the cardinality for each row of sc names. The second column counts the number of scs for each cardinality, and the remainder of each row lists ordinal numbers of scs for that cardinality. Ordinal numbers are followed by vergules with the number to the right of each vergule indicating the maximum possible number of forms a particular sc can hold. Set-classes identified in the score appear shaded. This format is consistent throughout.

In order to better appreciate the genus's effectiveness at modeling the pitch materials of the first-theme area and transition, its distinct qualities will now be examined by way of its characteristic scs. To facilitate this discussion, the genus's eight characteristic scs appear below in table 2.5.[19]

Table 2.5. The characteristic scs of the simple genus 8-28

Scs	Sias	Icvs
9-10	<1-1-1-1-2-1-2-1-2>	[668664]
8-28	<1-2-1-2-1-2-1-2>	[448444]
7-31	<1-2-1-2-1-2-3>	[336333]
6-30	<1-2-3-1-2-3>	[224223]
6-27	<1-2-1-2-3-3>	[225222]
5-31	<1-2-3-3-3>	[114112]
4-28	<3-3-3-3>	[004002]
3-10	<3-3-6>	[002001]

Examination of table 2.5 reveals some interesting properties about the genus. The table presents the eight characteristic scs (including the cynosural sc), their successive-interval arrays (sias), and their interval-class vectors (icvs). The scs, which cluster in complement pairs on either side of the two hexachordal scs 6-27 and 6-30, are all related by inclusion as

[19] For the definition of characteristic scs (characteristic members of a genus) please see chapter 1, p. 17.

their sias demonstrate.[20] In addition, interval successions of <1-2> and <1-2-3> characterize the scs from 9-10 through 5-31, while interval successions of <3> characterize scs 4-28 and 3-10 (in the case of sc 3-10 the pattern is extended to <3-3-6>).

As well as being related by means of inclusion, the characteristic scs for genus 8-28 also evince a remarkable degree of likeness with respect to their interval-class (ic) contents. Taken together, the scs contain a predominance of ic 3. The remaining interval-classes (ics) represented (with the exception of ic 6) are evenly distributed as the icvs indicate. Among the scs of the first-theme area and transition, scs 4-18 [102111]; 5-32 [113221]; 6-Z23 [234222], and 7-31 [336333] contain a predominance of ic 3. In addition, the remaining ics contained within scs 7-31 and 4-18 are evenly distributed.

Figure 2.5 summarizes the pc set-generic relations and formal divisions for the first-theme area and transition. The figure divides the presentation of the first-theme area into two sections (mm. 1-13 and mm. 13-37)[21] followed by the transition (mm. 38-43).

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[20] Inclusion relationships among scs can be determined on the basis of sias when the sia of one sc has consecutive elements, which when added together form an equivalent sia of another sc, and so on. For example, when the final two elements of sc 4-28's sia <3-3-3-3> are added to together (resulting in <3-3-6>), they form a sia equivalent to sc 3-10 <3-3-6>. These and similar relationships are described in greater detail in Richard Chrisman, "Identification and Correlation of Pitch-Sets," *Journal of Music Theory* 15 (1971): 58-83.

[21] The division of the first theme is not arbitrary, but reflects the motive's initial rhythmic appearance as ♩.♫ in mm. 1-13, and as ♫♩ in mm. 13-37.

Figure 2.5. The first-theme area's and transition's pc set-generic relations and formal divisions[22]

First Theme	Genus	Scs
mm. 1-13	8-28 (octatonic)	3-2, 3-3, 3-5, 3-7 3-11, 6-Z23
mm. 13-37	8-28 (octatonic)	3-2, 3-3, 3-5, 3-11 4-3, 4-10, 4-18, 5-32, 7-31
Transition	Genus	Scs
mm. 38-43	8-28 (octatonic)	3-2, 3-3, 3-11

The Second-Theme Area

Like the first-theme area and transition, the scs of the second-theme area are closely related by means of inclusion. However, the sc inventory of the second-theme area cannot be modeled well by way of the simple genus 8-28. In order to account for the pitch materials of the second-theme area it is necessary to introduce the complex genus 7-34/7-35. The complete list of member scs of the complex genus 7-34/7-35 is presented below as table 2.6. The complex genus effectively models the sc inventory of the second-theme area since almost all of the scs represented, 23 out of 28 (excluding the cynosural scs themselves), are primary members of the genus; that is, they represent members of the intersection of simple genera about 7-34 and 7-35. In addition, four scs (6-33, 8-21, 8-26, and 9-6), whose high degree of inclusion was noted above, feature important pc set-generic dimensions. For example, sc 6-33, which is connected by inclusion to 26 out of 28 possible scs (see table 2.3), is particularly significant since it is the only hexachord to hold all primary scs of 7-34 and 7-

[22] The figure is divided into three columns. The first column indicates sectional divisions with measure numbers; the second column lists the genus type; and, the last column lists the scs involved. This format is consistent throughout.

35 in common (i.e., those scs that represent the intersection of 7-34 and 7-35). In addition, the nonachord 9-6, which is connected to 26 out of 28 scs, is a superset of both 7-34 and 7-35 (and thus a member of the intersection of 7-34/7-35). And, finally, the two octachords, 8-21 and 8-26, holding 25 and 26 scs in common respectively (out of a possible 27), each represent supersets of either 7-34 or 7-35, the former representing a superset of 7-34 and the latter representing a superset of 7-35.

Table 2.6. The complex genus 7-34/7-35[23]

<table>
<tr><td colspan="3">Complex Genus 7-34/7-35 (76 scs, 42 primary, 34 secondary)</td></tr>
<tr><td>Cynosural Sc</td><td>Counts</td><td>Ordinal Number/Number of Forms</td></tr>
<tr><td>7-34</td><td></td><td></td></tr>
<tr><td>2</td><td>6</td><td>1|2 2|5 3|4 4|4 5|4 6|2</td></tr>
<tr><td>3</td><td>11</td><td>2|4 3|2 4|2 5|2 6|3 7|6 8|6 9|3 10|2 11|4 12|1</td></tr>
<tr><td>4</td><td>17</td><td>3|1 10|2 11|2 12|2 13|2 14|2 15|2 16|2 19|2 21|2 22|4 23|2 24|2 25|1 26|1 27|4 29|2</td></tr>
<tr><td>5</td><td>12</td><td>10|2 17|1 23|2 24|2 25|2 26|2 28|2 29|2 30|2 33|1 34|2 35|1</td></tr>
<tr><td>6</td><td>4</td><td>23|1 24|2 33|2 34|2</td></tr>
<tr><td>7</td><td>1</td><td>34|1</td></tr>
<tr><td>8</td><td>3</td><td>21|1 22|2 27|2</td></tr>
<tr><td>9</td><td>6</td><td>6|2 7|2 8|2 9|1 10|1 11|2</td></tr>
<tr><td>10</td><td>5</td><td>2|3 3|2 4|2 5|2 6|1</td></tr>
<tr><td>Total</td><td>65</td><td></td></tr>
<tr><td>7-35</td><td></td><td></td></tr>
<tr><td>2</td><td>6</td><td>1|2 2|5 3|4 4|3 5|6 6|1</td></tr>
<tr><td>3</td><td>9</td><td>2|4 4|4 5|2 6|3 7|8 8|2 9|5 10|1 11|6</td></tr>
<tr><td>4</td><td>13</td><td>8|1 10|2 11|4 13|2 14|4 16|2 20|2 21|1 22|6 23|4 26|3 27|2 29|2</td></tr>
<tr><td>5</td><td>9</td><td>12|1 20|2 23|4 24|2 25|2 27|4 29|2 34|1 35|3</td></tr>
<tr><td>6</td><td>4</td><td>25|2 26|1 32|2 33|2</td></tr>
<tr><td>7</td><td>1</td><td>35|1</td></tr>
<tr><td>8</td><td>3</td><td>22|2 23|2 26|1</td></tr>
<tr><td>9</td><td>4</td><td>6|1 7|4 9|3 11|2</td></tr>
<tr><td>10</td><td>4</td><td>2|3 3|2 4|1 5|4</td></tr>
<tr><td>Total</td><td>53</td><td></td></tr>
</table>

[23] The layout of table 2.6 follows that of table 2.4 except that each of the two simple genera, which together form the complex genus, are presented first. The complex genus (UNION) is then presented followed by the complex genus's primary scs and the complex genus's secondary scs. Once again, scs identified in the score appear shaded. This format is consistent throughout.

Table 2.6 (continued)

UNION		
2	6	1/4 2/10 3/8 4/7 5/10 6/3
3	11	2/8 3/2 4/6 5/4 6/6 7/14 8/8 9/8 10/3 11/10 12/1
4	19	3/1 8/1 10/4 11/6 12/2 13/4 14/6 15/2 16/4 19/2 20/2 21/3 22/10 23/6 24/2 25/1 26/4 27/6 29/4
5	15	10/2 12/1 17/1 20/2 23/6 24/4 25/4 26/2 27/4 28/2 29/4 30/2 33/1 34/3 35/4
6	7	23/1 24/2 25/2 26/1 32/2 33/4 34/2
7	2	34/1 35/1
8	5	21/1 22/4 23/2 26/1 27/2
9	6	6/3 7/6 8/2 9/4 10/1 11/4
10	5	2/6 3/4 4/3 5/6 6/1
Total	76	
Primary Scs		
2	6	1/4 [redacted] 4/7 [redacted] 6/3
3	9	[redacted] 4/6 5/4 [redacted] 7/14 [redacted] 9/8 [redacted]
4	11	[redacted] 16/4 21/3 22/10 [redacted] 27/6 29/4
5	6	[redacted] 29/4 34/3 [redacted]
6	1	[redacted]
7	0	
8	1	22/4
9	4	[redacted] 7/6 9/4 11/4
10	4	[redacted] 4/3 [redacted]
Total	42	
Secondary Scs		
2	0	
3	2	[redacted] 12/1
4	8	3/1 8/1 [redacted] 15/2 [redacted] 20/2 24/2 25/1
5	9	10/2 12/1 17/1 20/2 26/2 27/4 28/2 30/2 33/1
6	6	23/1 24/2 25/2 26/1 32/2 34/2
7	2	[redacted]
8	4	[redacted] 23/2 [redacted] 27/2
9	2	8/2 10/1
10	1	6/1
Total	34	

Having established a connection between the pitch materials of the second-theme area and the complex genus 7-34/7-35, the characteristic scs of the complex genus will now be examined. In order to facilitate this discussion, a list of the genus's characteristic scs is presented below as table 2.7.

Table 2.7. The characteristic scs of the complex genus 7-34/7-35

Scs	Sias	Icvs
9-6	<1-1-1-1-1-1-2-2-2>	[686763]
8-22	<1-1-1-2-1-2-2-2>	[465562]
7-35	<1-2-2-1-2-2-2>	[254361]
7-34	<1-2-1-2-2-2-2>	[254442]
6-33	<2-1-2-2-2-3>	[143241]
5-34	<2-2-2-3-3>	[032221]
4-22	<2-2-3-5>	[021120]
3-6	<2-2-8>	[020100]

Once again the characteristic scs are presented along with their sias and icvs. The icvs of the characteristic scs reveal that ic 2 is the most well represented. In addition, contained with the icvs of scs 4-22 through 8-22, ascendant patterns of ics 2 and 3 result: ic 2 occurring in ascending order from 2 through 6, and ic 3 occurring in ascending order from 1 through 5. Among the ics represented by all eight of the characteristic scs, ic 5 is the second-to-most well represented ic, following ic 2 (ic 2 receives a total of 35 counts, while ic 5 receives a total of 30). When assessing the properties of the complex genus 7-34/7-35 it is helpful to remember that both cynosural scs represent scalar formations of major and/or minor scale collections (sc 7-34 represents the melodic minor scale in its ascending form when ordered <2122221>, and sc 7-35 represents the major scale when ordered <2212221>, and the natural minor scale when ordered <2122122>. These features of the two cynosural scs reflect an important association between the two collections: both exhibit diatonic characteristics. Relationships between the complex genus 7-34/7-35 and the simple diatonic genus 7-35 will be discussed in connection with the third movement of the Sonata in chapter 4.

Although all of these features of the genus's characteristic scs contribute to the rich harmonic variety and range of possibilities that the complex genus's scs afford, in the context of the second-theme area, Bartók tends to limit his choice to those scs that strongly represent ics 2, 5, or both (e.g. 4-14 [111120]; 4-23 [021030]; 5-24 [131221]; 5-35 [032140]; 6-33 [143241]; 7-34 [254442]; 7-35 [254361]; 8-21 [474643], and 9-6 [686763]).

Figure 2.6 outlines the second-theme area's pc set-generic relations and formal divisions. Unlike figure 2.4 and table 2.3, figure 2.6 accounts for the pitch materials of mm. 55-56 and mm. 61-63. These measures had been previously excluded from the sc inventory of the second-theme area because the scs they embody (a form of sc 4-18 {1478} in mm. 55-56, and forms of sc 4-18 {1478} and 5-31 {78t14} in mm. 61-63) are not subsets of either 7-35 or 7-34. They are, however, subsets of the first theme's octatonic genus 8-28 as indicated in figure 2.6. Not only does the sc content of these measures relate to the first-theme area, but these measures reflect a decelerated attack rhythm, from eighth-notes and quarter-notes to quarter-notes and half-notes (noted above), similar in manner to the first-theme area's closing measures (mm. 36-37).

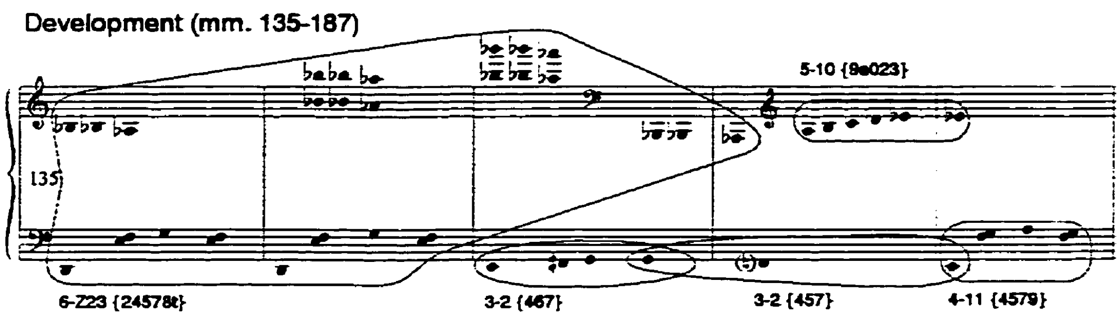
Figure 2.6. The second-theme area's pc set-generic relations and formal divisions

Second-Theme Area	Genus	Scs
Theme A mm. 44-56	7-34/7-35	2-2, 2-3, 2-5, 3-2 3-3, 3-6, 3-8, 3-10 3-11, 4-10, 4-12 4-13, 4-14, 4-19 4-26, 6-33, 9-6 10-2, 10-3, 10-5
mm. 55-56	8-28 (octatonic)	4-18
Theme B mm. 57-75	7-34/7-35	4-23, 5-25, 5-35 6-33, 7-35, 8-21 9-6
mm. 61-63	8-28 (octatonic)	4-18, 5-31
Theme C mm. 76-92 & mm. 93-115	7-34/7-35	3-2, 4-10, 4-11 5-23, 5-24, 7-34 7-35, 8-21, 8-26
Theme D mm. 116-125	7-34/7-35	3-2, 3-8, 3-11, 4-10 4-14
Theme E mm. 126-134	7-34/7-35	3-2, 3-8, 3-11, 7-35

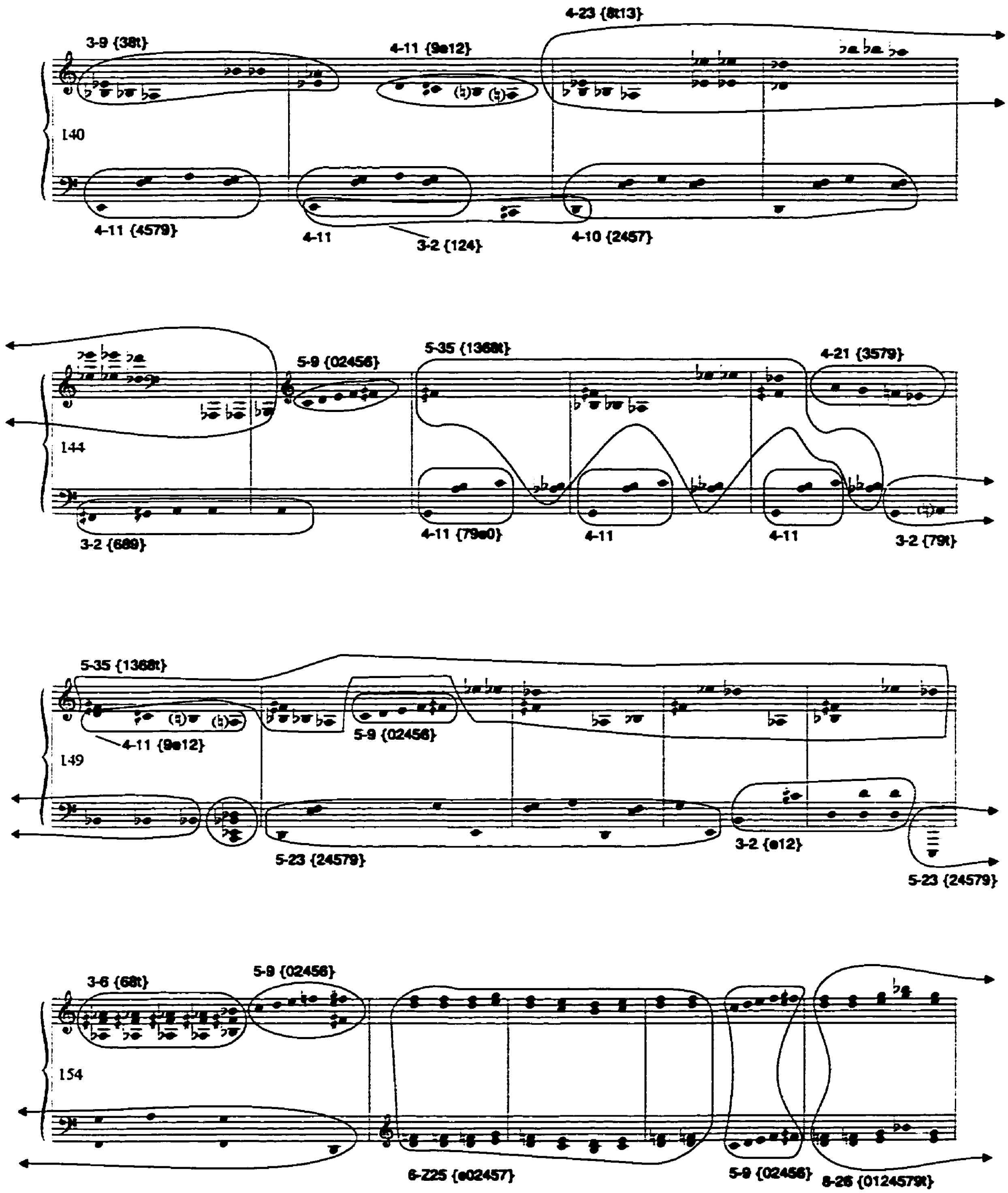
The Development

The pitch materials of mm. 135-186 can be accounted for by means of the first theme's octatonic genus about sc 8-28 and the second theme's complex genus about scs 7-34/7-35 (a pitch reduction and segmentation of these measures appears below as example 2.12). Two exceptions should, however, be noted. The first involves the presentation of two forms of sc 5-9, {02456} and {79e01}, interspersed between mm. 145-170. Set-class 5-9 represents an anomaly with respect to the sc content of the movement, given that it is neither a subset of the simple genus 8-28 nor of the complex genus 7-34/7-35. It is interesting to note, however, that these forms of sc 5-9, {02456} and {79e01}, are always formed as ordered sets by a single pc extension to an ordered form of sc 4-11, {0245} and {79e0} respectively, a tetrachordal subset of the complex genus 7-34/7-35.

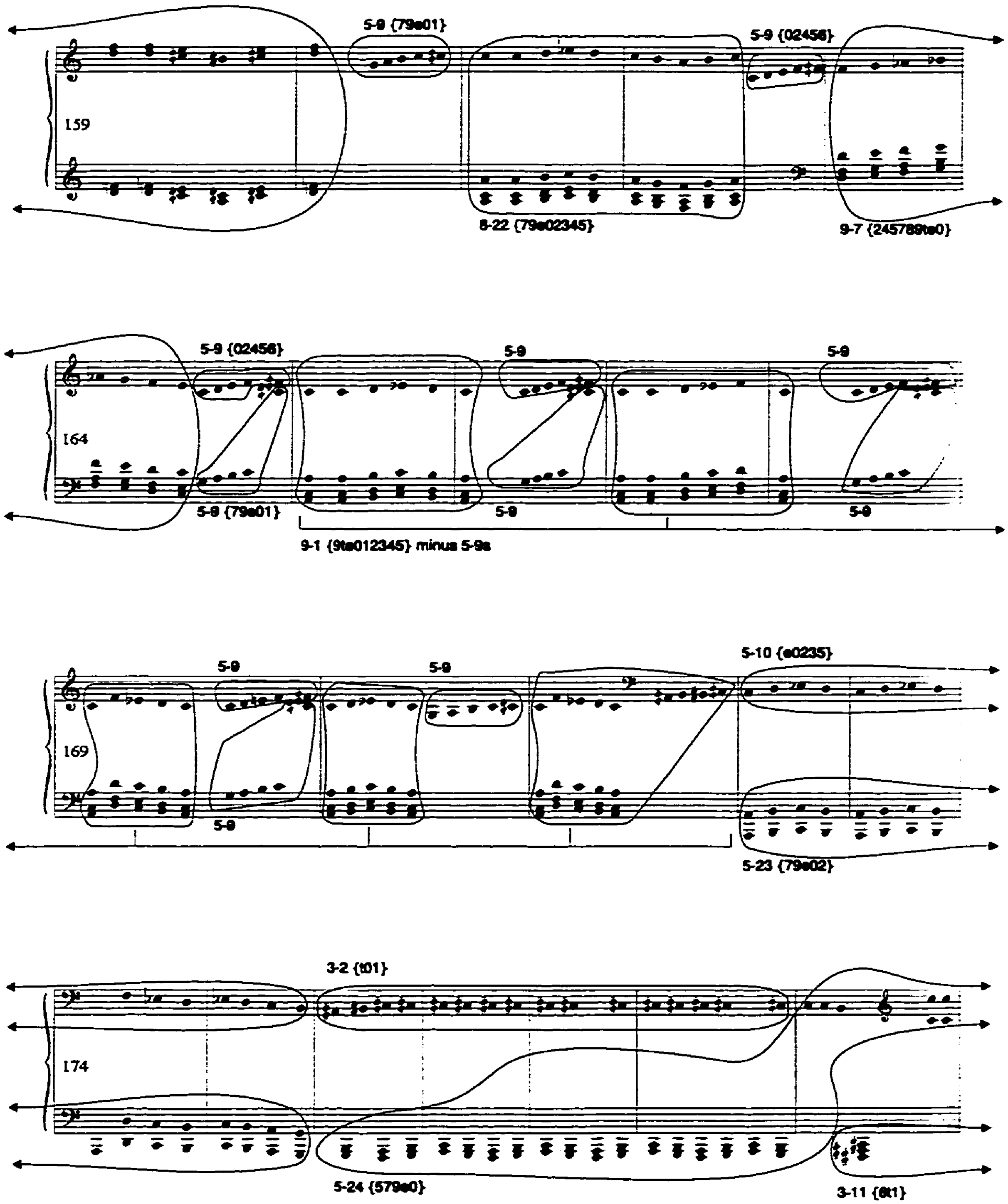
Example 2.12. Pitch reduction and segmentation of the development



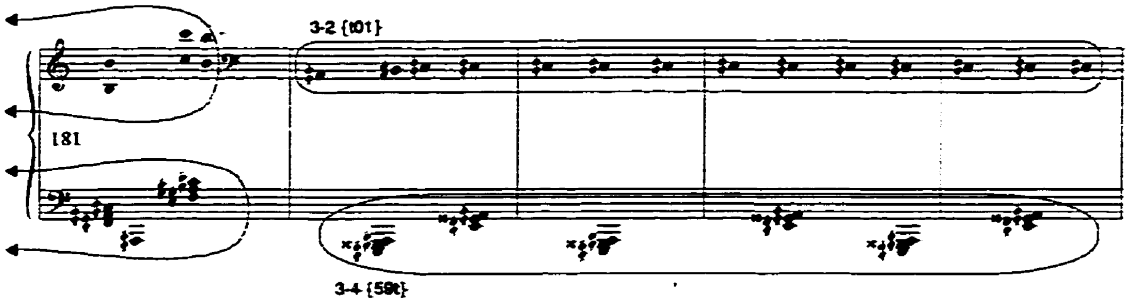
Example 2.12 (continued)

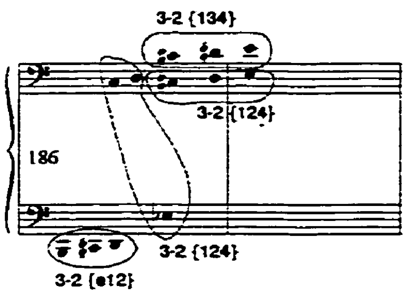


Example 2.12 (continued)



Example 2.12 (continued)

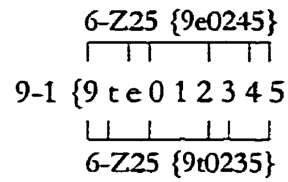




The second exception, occurring in mm. 165-171, concerns a series of fragmented statements of the opening measures of the second-theme area's theme A. Taken together, the pc content of mm. 165-171 (excluding the interjections of sc 5-9), expresses a form of sc 9-1 {9te012345}. Although this chromatic nonachord is not representative of either the octatonic genus 8-28 or the complex genus 7-34/7-35, contained within sc 9-1 are two forms of sc 6-Z25 (a subset of the complex genus 7-34/7-35) and twelve forms of the familiar motivic sc 3-2 (see figure 2.7). Among the nonachord's trichordal subsets, no other trichord appears in as many forms.

Figure 2.7. Forms of scs 6-Z25 and 3-2 contained within sc 9-1

A) Two forms of 6-Z25 {9e0245} and {9t0235}



B) Twelve forms of 3-2

Top: {9e0}, {to1}, {e12} {023}, {134}, {245}

Bottom: {9t0}, {te1}, {e02}, {013}, {124}, {235}

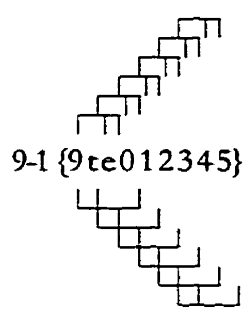


Figure 2.8 presents the development's pc set-generic relations and thematic associations following the outline of figure 2.1.

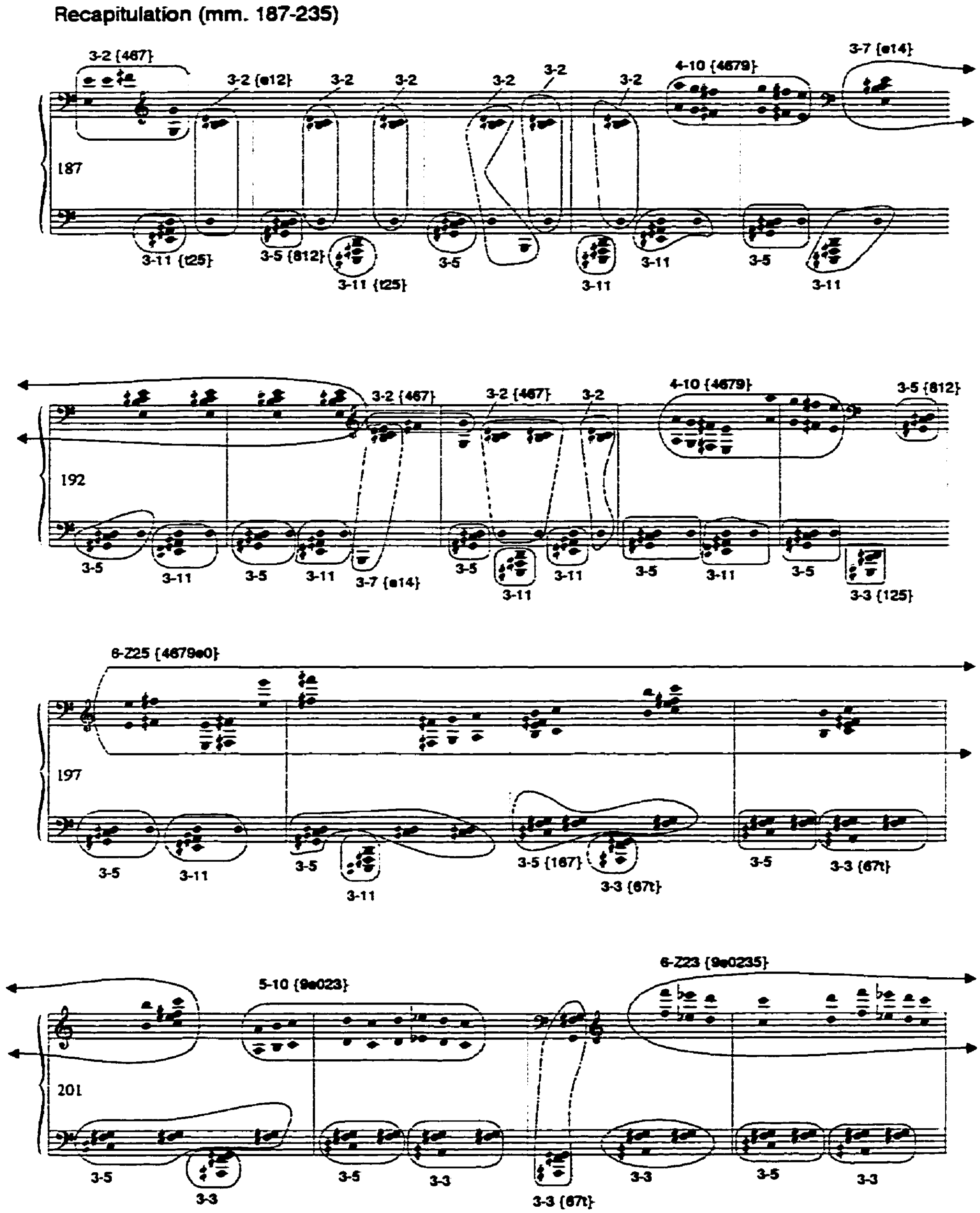
Figure 2.8. The development's pc set-generic relations and thematic associations

Development	Genus	Scs
mm. 135-154 first theme	8-28 (octatonic)	3-2, 5-10, 6-Z23
second theme (E)	7-34/7-35	3-6, 3-9, 4-10, 4-11 4-21, 4-23, 5-23, 5-35
second theme (A) mm. 155-171	7-34/7-35	6-Z25, 8-22, 8-26 9-7
mm. 165-171	(chromatic)	9-1
second theme (D) mm. 172-185	7-34/7-35	3-4, 5-10, 5-23, 5-24
first theme mm. 176-187	8-28 (octatonic)	3-2, 3-11

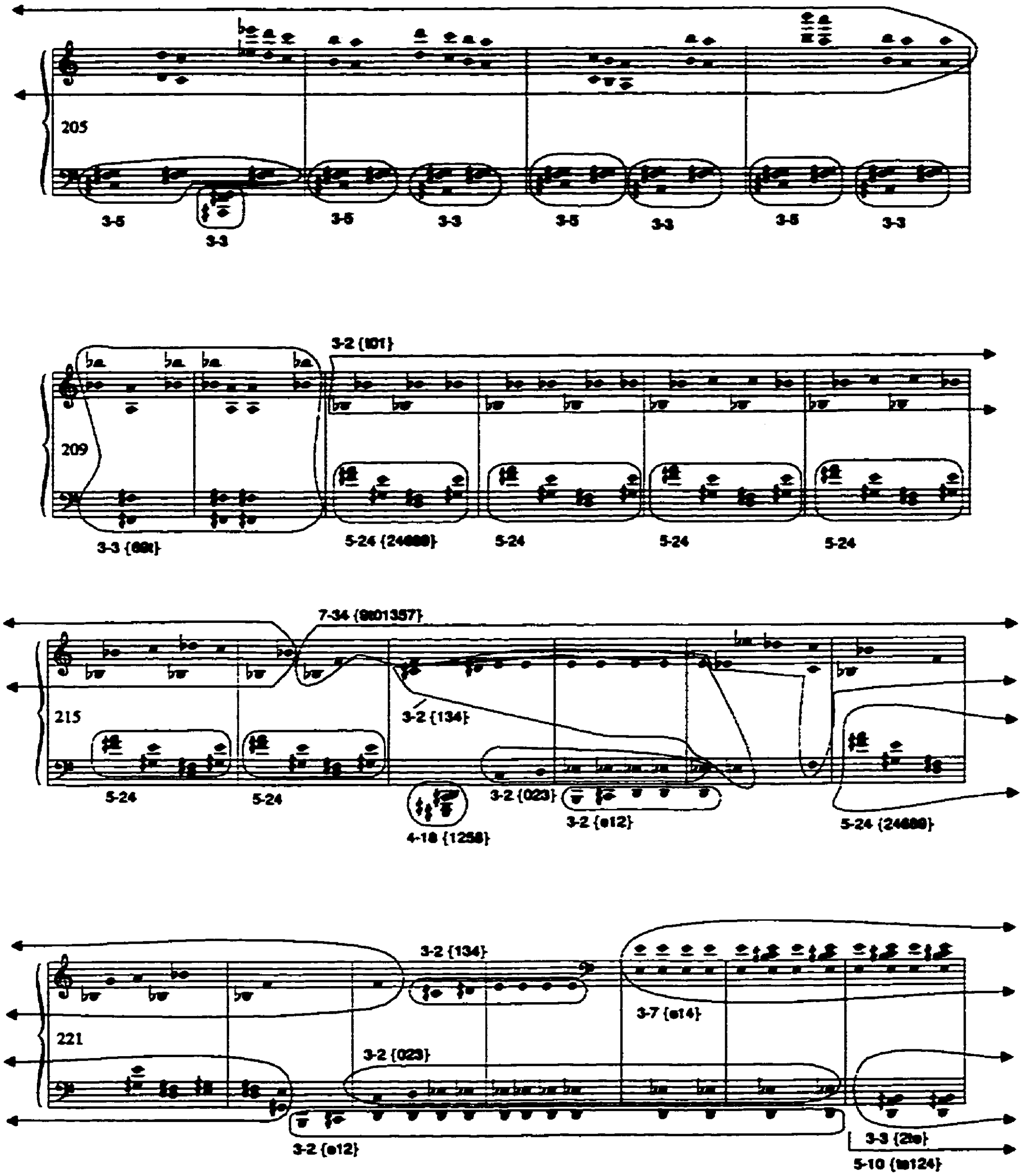
The Recapitulation

As figure 2.1 indicates, a great deal of the material of the recapitulation comes from the first theme. In fact, of the recapitulation's 50 measures, only 16 are devoted to material from the second theme. However, within the recapitulation, Bartók incorporates a pc set-generic alteration in which material from the first theme, presented in the RH in mm. 197-201, embodies a sc associated with the second theme (see example 2.13). The sc presented is a form of 6-Z25 {4679e0}. As mentioned above, sc 6-Z25 is a subset of the complex genus 7-34/7-35 but not of the octatonic genus 8-28. The recapitulation does close, however, with a clear presentation—in terms of both its pitch structure and interval structure—of material from the second theme (theme E) in mm. 233-235 (see example 2.13). The recapitulation's pc set-generic relations and thematic associations are presented in figure 2.9.

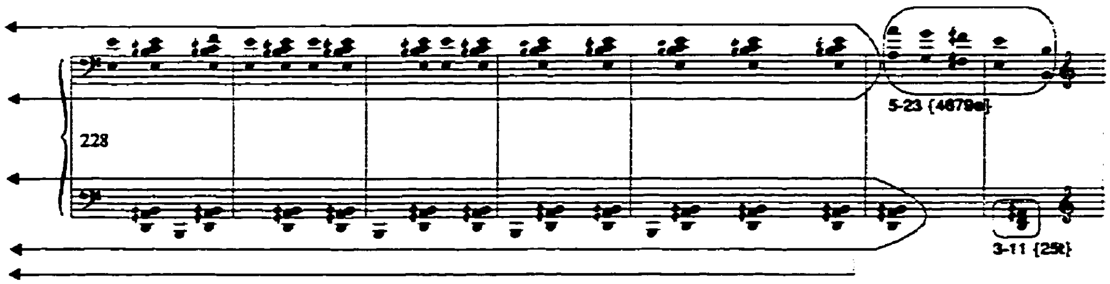
Example 2.13. Pitch reduction and segmentation of the recapitulation



Example 2.13 (continued)



Example 2.13 (continued)



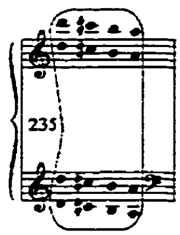


Figure 2.9. The recapitulation's pc set-generic relations and thematic associations

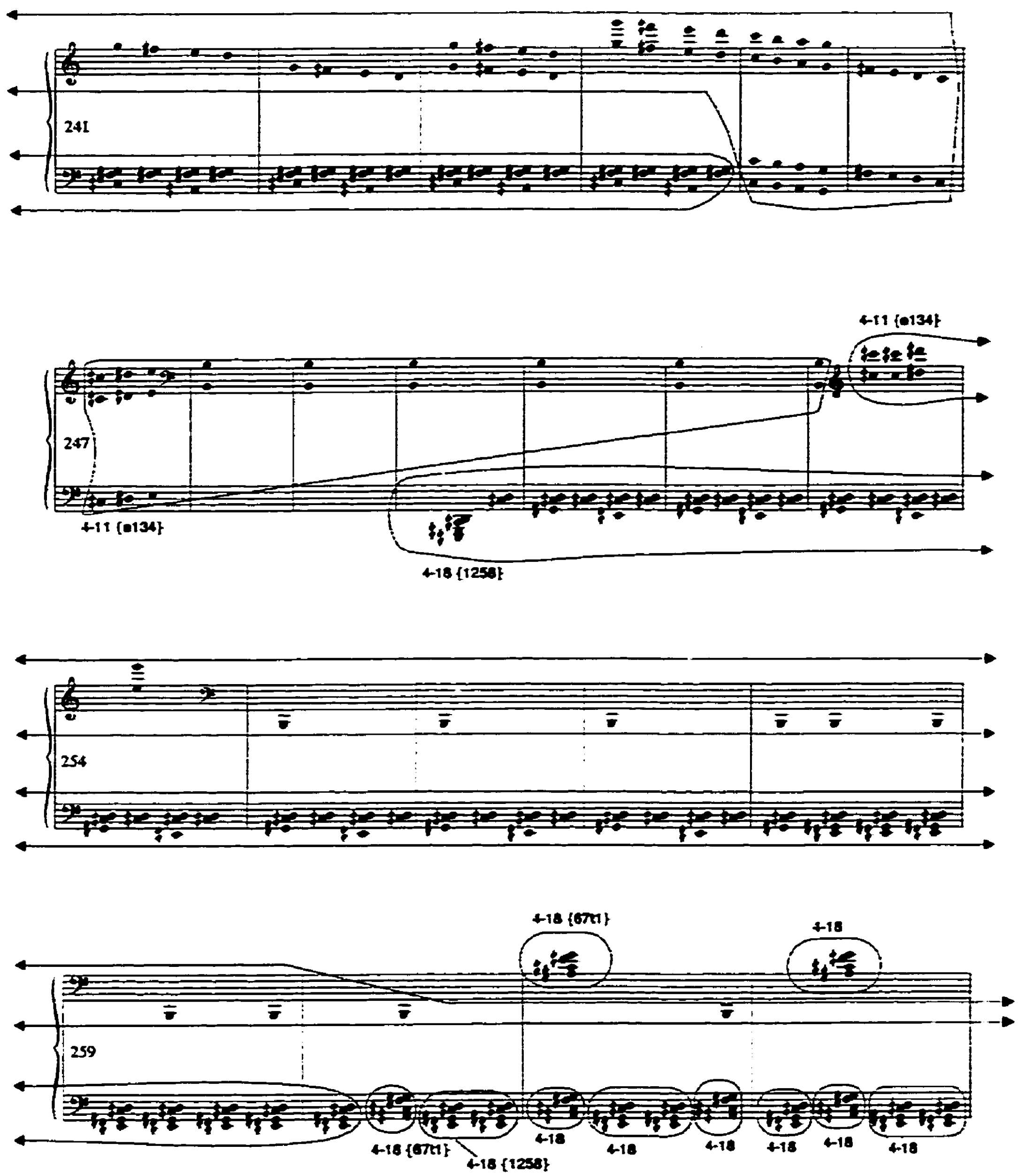
Recapitulation	Genus	Scs
first theme mm. 187-210	8-28 (octatonic)	3-2, 3-3, 3-5, 3-7 3-11, 4-10, 4-18 5-10, 6-Z23
mm. 197-201	7-34/7-35	6-Z25
second theme (C) mm. 211-223	7-34/7-35	5-24, 7-34
first theme mm. 217-219	8-28 (octatonic)	3-2, 4-18
first theme mm. 222-233	8-28 (octatonic)	3-2, 3-3, 3-7, 5-10
second theme (E) mm. 233-235	7-34/7-35	3-11, 4-11, 5-23

The Coda

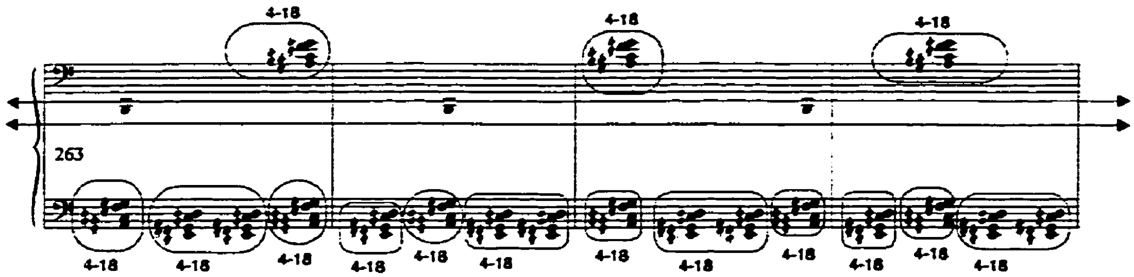
In contrast to the recapitulation, the coda concludes the movement with an extended presentation (in the RH) of material from the second theme (theme's E and C); see example 2.14. This is complemented, however, by the LH, which returns to the first theme's rhythmic ostinato of eighth notes in mm. 236-244 and mm. 250-268. Not only does the ostinato reflect a rhythmic association with the first theme (mm. 2-35), but its pc set contents also connects it to the first theme. This can be seen in the pitch reduction and segmentation presented as example 2.14 in which the LH presents both forms of the octatonic sc 4-18, mentioned above in connection with the first-theme area: {67t1} in mm. 236-244 and {1258} in mm. 250-260. In addition, in mm. 260-268, the LH alternates between both forms of sc 4-18, while the RH presents accented and registrally distinct statements of the sc in the form {67t1}. The coda's pc set-generic relations and thematic associations are presented in figure 2.10.

Example 2.14. Pitch reduction and segmentation of the coda

Example 2.14 (continued)



Example 2.14 (continued)



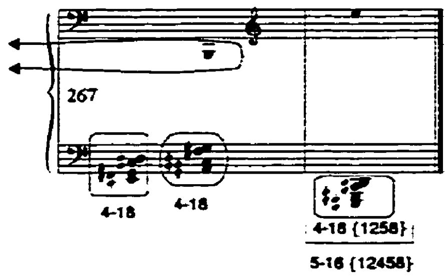


Figure 2.10. The coda's pc set-generic relations and thematic associations

Coda	Genus	Scs
mm. 236-246 RH: second theme (E) LH: first theme	7-34/-35 8-28 (octatonic)	7-35 4-18
second theme (C) mm. 247-268	7-34/7-35	4-11
first theme mm. 250-268	8-28 (octatonic)	4-18, 5-16

The concluding measures of the movement also combine references from both the first and second themes (see example 2.14). This is achieved by a kind of thematic counterpoint in the RH in mm. 260-267. The RH alternates between the low B pedal—which as an expression of sc 4-11 {e134} prolongs the coda's reference to the second theme

(theme C)—and a form of the octatonic sc 4-18 {67t1}.[24] The movement concludes with a final gesture in which sc 4-18, presented in the LH in m. 268 in its familiar form {1258}, is expanded (as a result of the RH's presentation of pc {4}), to form the octatonic pentachord 5-16 {12458}.

******

Although a thematic key scheme in the traditional sense does not apply to this movement of the Sonata (or any other movement for that matter), each theme area, as we have seen, can successfully be modeled by a distinct genus. The relationship between the first-theme area and the octatonic genus 8-28, and the second-theme area and the complex genus 7-34/7-35, can therefore be seen to serve, in some sense, as a post-tonal analogue for tonal modulation. However, whether or not one chooses to embrace such a comparison, the change in genus between the first-theme area and the second-theme area serves to signal the arrival of something new, namely, the commencement of a new formal subdivision.

Having examined the movement in terms of surface musical features, pc set-theoretical relationships, and pc set-generic relationships, this chapter has set out to

[24] Set-class 4-11's reference to theme C is made clear when comparing mm. 85-86 of theme C's initial statement, which presents a form of sc 4-11 {3578}, and mm. 109-110 of theme C's second statement, which also presents a form of sc 4-11 {t023} (see example 2.10). When comparing these measures with the coda it is useful to examine the score since the coda's pitch reduction cannot demonstrate that a rhythmic connection also exists between these statements of sc 4-11. The rhythmic representation of sc 4-11 in mm. 85-86 and 247-248 is ♫ ♩ 𝅗𝅥, with each rhythmic value representing one of the pcs of sc 4-11, while the rhythmic representation of sc 4-11 {t023} in mm. 109-110 is just slightly altered, appearing as ♫ ♩ ♩.

demonstrate that formal subdivisions, thematic associations, pc sets, and pc set genera all work together in forging a coherent large-scale structure for this movement.

CHAPTER 3

THE SECOND MOVEMENT OF THE SONATA FOR PIANO (1926)

Form

The second movement of the Sonata is substantially shorter than the outer two movements. Its formal design, however, made manifest in part by its motivic and gestural organization, is nevertheless intricate. A formal plan for the second movement is presented as figure 3.1. The plan outlines the movement's large-scale composite ternary design. I have partitioned the opening section, section A (mm. 1-29), into a four-part design (labeled a-b-a'-b' in figure 3.1). In addition, I have partitioned the concluding section, section A' (mm. 43-62), into a small ternary design (labeled a-b-a' in figure 3.1).[1] I have not, however, segmented mm. 30-42, section B, into smaller subsections. Although I have defined each of the sectional divisions by Bartók's manipulation of melodic and harmonic motivic material (to be examined in this section), we shall see that pitch-structural relationships also help to delineate formal sections.

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[1] My formal plan is similar to Wilson's but does not incorporate his subdivision of "a" and "b" material within the large-scale A-B-A' design (see *The Music of Béla Bartók*, 71). Konoval, on the other hand, chooses not to present a formal scheme in his discussion of form (see *An Analytical Study*, 65-78).

Figure 3.1. Formal plan of the second movement

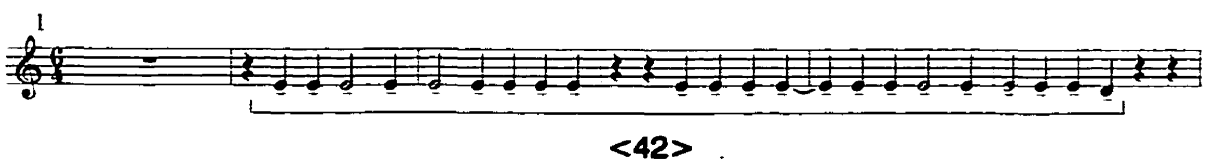
Section A (mm. 1-29)			
subsection a	subsection b	subsection a'	subsection b'
mm. 1-6	mm. 7-14	mm. 15-23	mm. 24-29

Section B	Section A' (mm. 43-62)		
	subsection a	subsection b	subsection a'
mm. 30-42	mm. 43-46	mm. 47-58	mm. 59-62

Section A

Section A's subdivisions are partially defined by Bartók's attention to register and texture. For instance, mm. 1-6, which constitute the initial subsection a, provide a homophonic setting for the presentation of the opening material, consisting of the LH's accompanying trichord set against the RH's melodic presentation of the opening motivic dyad <42> (see example 3.1).

Example 3.1. The opening motivic dyad



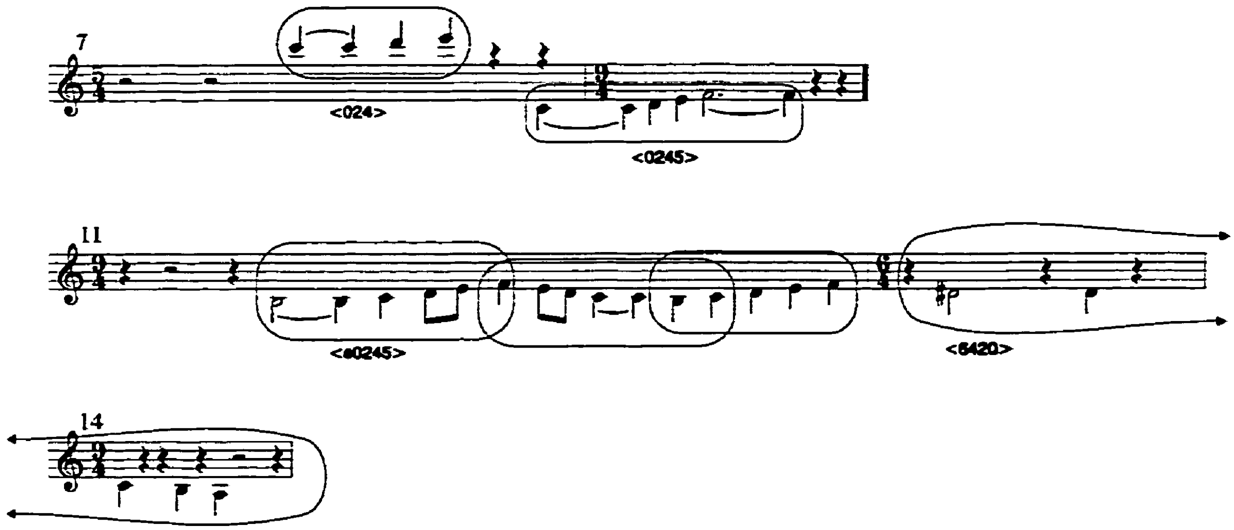
Subsection b (mm. 7-14) differs from the preceding subsection in a number of important ways. For example, subsection a (whose boundary pcs are A$\flat$ and e^1) is registrally static, while subsection b is mutable throughout (its boundary pcs extend from C to e^3).[2] Moreover, the contrapuntal writing in mm. 7-12 constitutes an important change from the homophonic texture of the opening measures. However, motivic similarities between the two subsections also present themselves. For example, while subsection a focuses on the dyad <42>, subsection b presents various contrapuntal statements of its own trichord <024>, which extends the opening dyad (see example 3.2).[3] This melodic trichord is first presented in the RH (top voice) in mm. 7-8. The motive is then developed symmetrically by melodic extension, first through the inclusion of pc {5}, in mm. 8-9 (RH, bottom voice), and then by pc {e} in mm. 11-12. In addition, a symmetrical expansion of subsection a's motivic dyad <42> is presented in the lowest voice of the LH in mm. 13-14 as <6420>.

---

[2] References to specific pitches correspond to the following system: c^1 is assigned to middle C (with lowercase letters and superscript "^{1}" used for the remaining pitches up to and including the B above); c^2 is assigned to the next higher octave, and so on. The octave below middle C is not assigned a superscript and the octave below that employs uppercase letters; the next octave below contains the subscript "$_1$" and so on.

[3] Of course, the trichord <024> incorporates the pcs of the opening dyad <42> in retrograde form.

Example 3.2. Expansions of the melodic trichord <024>

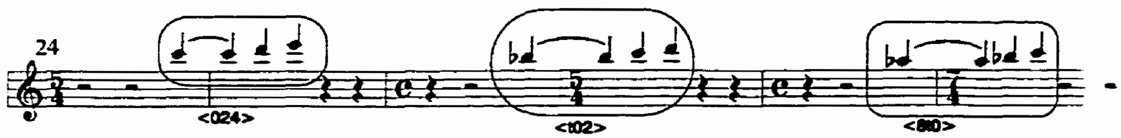


Subsection a' (mm. 15-23) begins in a manner similar to the opening measures. For example, the LH's presentation of the opening harmonic trichord, in mm. 15-17, resembles that of mm. 1-6 (except for the octave transfers in mm. 16 and 17). Subsection a' also develops the dyadic motive of mm. 2-6 <42> (see example 3.3). This development can be seen by examining the pitch content of the RH in mm. 17-21, which emphasizes (through registral placement) both the pcs of the opening motive (4 and 2) and pcs {7} and {9} (the pcs of the motive transposed by T_5).

Example 3.3. Development of the opening motive <42>

The concluding subsection b' (mm. 24-29) presents variations on material from subsection b, focusing initially (in the RH) on subsection b's trichord <024>, in the top voice of mm. 24-25 (see example 3.4). This melodic trichord is presented in sequence (together with its harmonic support in the RH), by descending wholetones, in mm. 26-27 and mm. 28-29.

Example 3.4. The sequential presentation of trichord <024>



Section B

Section B returns to a predominantly homophonic texture in mm. 30-38. However, this time, it is the RH that provides a harmonic accompaniment against the LH's accented melodic ascent (top voice) from e to e♮^{1}. This melodic ascent occurs over the LH's D-pedal beginning on the last beat of m. 29.[4] The section is also distinguished from the preceding section by its pc set contents.[5] The conclusion of section B follows a procedure similar to that used in the first movement; m. 42 presents a decelerated attack rhythm (from quarter-

[4] The significance of section B's emphasis on pcs {4} and {2} (the pcs of the opening motivic dyad) will be addressed in the following section.

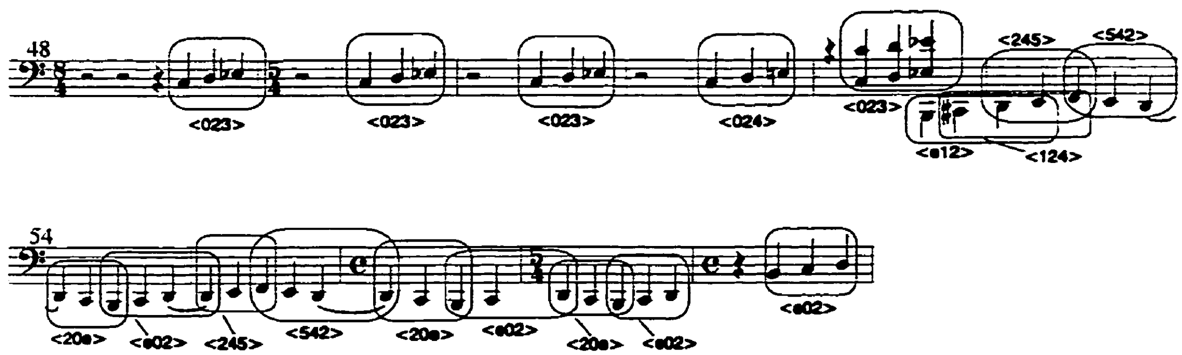
[5] Pitch materials will be examined shortly.

notes to half-notes), which serves to signal an impending formal boundary (the beginning of section A' at m. 43).[6]

Section A'

Section A' is shorter than section A (lasting 20 measures as opposed to 29). What distinguishes this section (aside from its length) is Bartók's development of motivic material previously presented. For instance, as example 3.5 demonstrates, in mm. 48-52 we may understand the trichord <023>, presented in the top voice of the LH, as a contraction of subsection b's three-note motive <024> (but note that the final statement at m. 52 is preceded by a statement of the motive <024>). Similarly, in mm. 52-58, the bottom voice of the LH presents the three-note motive, both ascending and descending (at various levels of transposition and inversion), in its contracted form.[7]

Example 3.5. The three-note motive in its contracted form



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[6] Once again my formal plan diverges from Wilson's, which places the beginning of section A' at m. 42. See *The Music of Béla Bartók*, 71.

[7] This contracted form of the motive, which also appears briefly in subsection b' (in the LH at mm. 25 and 27), is identical in intervallic contour to the first movement's opening three-note motive (i.e., both are forms of sc 3-2).

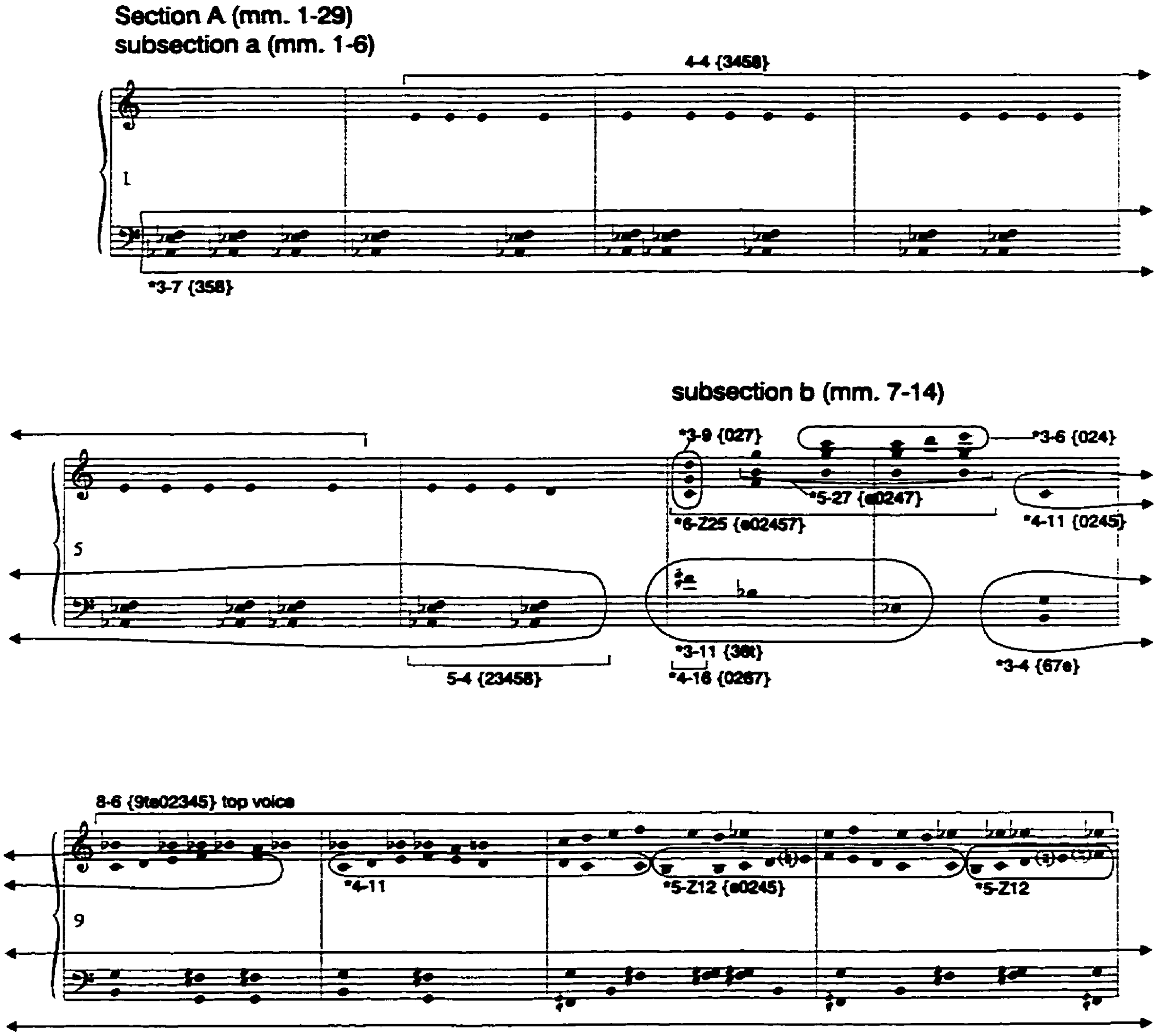
Pitch-Class Set Relations

This section will explore pc set relations within each of the movement's large-scale formal divisions, beginning with sections A and A'. Although these sections have been divided into smaller subsections in order to illustrate important motivic developments, the following discussion will examine relationships among the movement's large-scale formal divisions in order to demonstrate Bartók's economic use of pitch materials within the movement's overall composite ternary design. In a manner similar to the previous chapter, we will consider set-theoretical relationships among the scs identified within each section, focusing in particular (but not exclusively) on relationships of sc inclusion. We will also examine pitch-structural relationships engaged between contrasting formal sections.

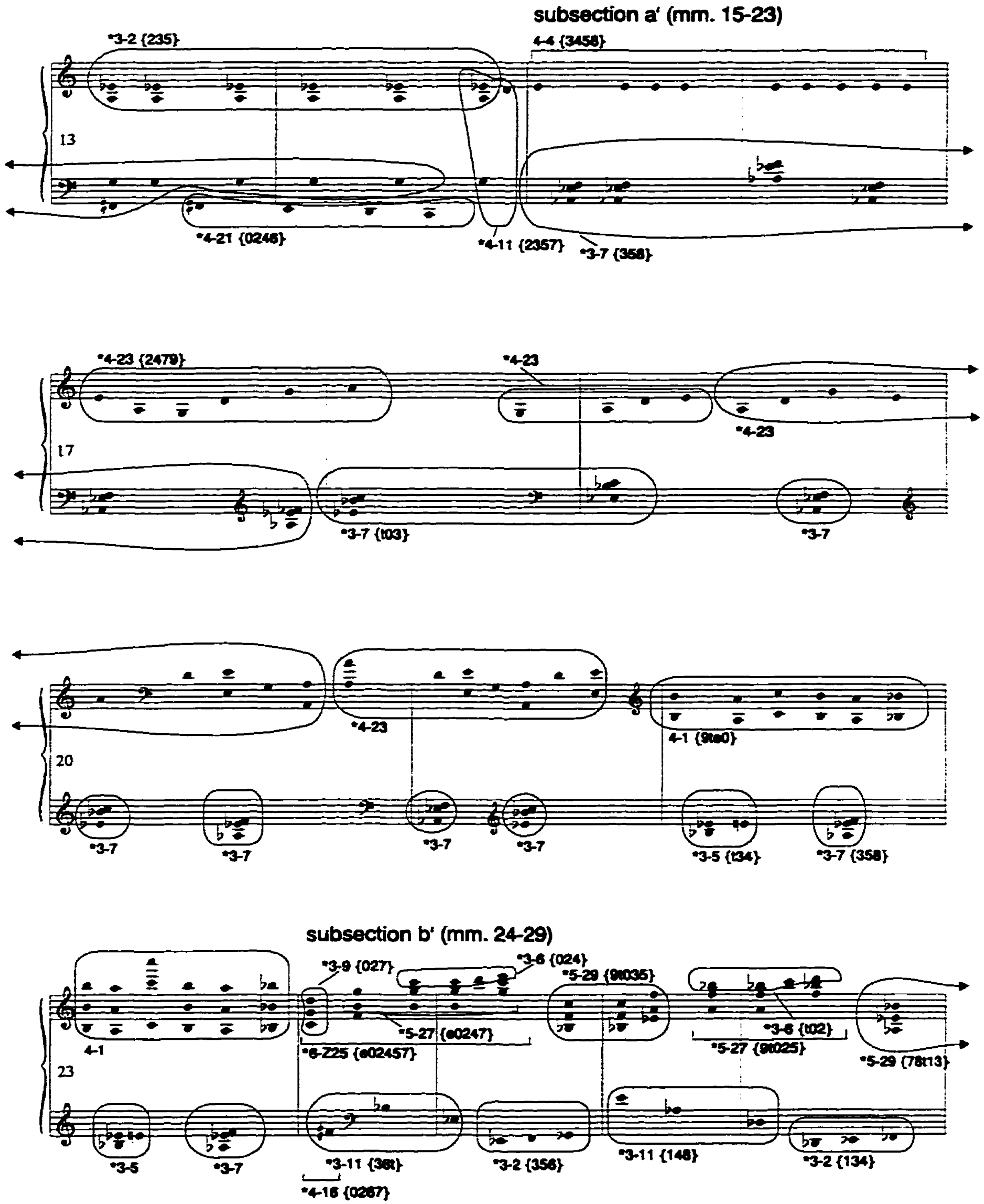
Sections A and A'

Examples 3.6 and 3.7 present pitch reductions and segmentations of sections A and A' respectively. I should note that my segmentation strategy (for the entire movement) relies on primary segments; that is, segments determined on the basis of motivic and gestural conjunctions. Like the first movement's second-theme area, many of the scs of sections A and A' are subsets of the diatonic collection 7-35. However, an important distinction between the first two movements lies in the second movement's incorporation of a larger number of scs that fall outside the spectrum of the diatonic collection 7-35 (and with the exception of sc 3-3, the octatonic collection as well). These non-diatonic scs (3-3, 4-1, 4-4, 5-4, 5-Z17, 6-Z3, and 8-6) demonstrate a strong degree of interconnection as we shall see below. Taken as a group, all of the scs identified, which constitute the sc inventory of the two sections, demonstrate relatively little interconnection in terms of inclusion; however, dividing the inventory into two distinct groups: diatonic scs and non-diatonic scs, reveals a greater degree of interconnection among the scs contained within each group. (Diatonic scs have been identified in examples 3.6 and 3.7 with an asterisk).

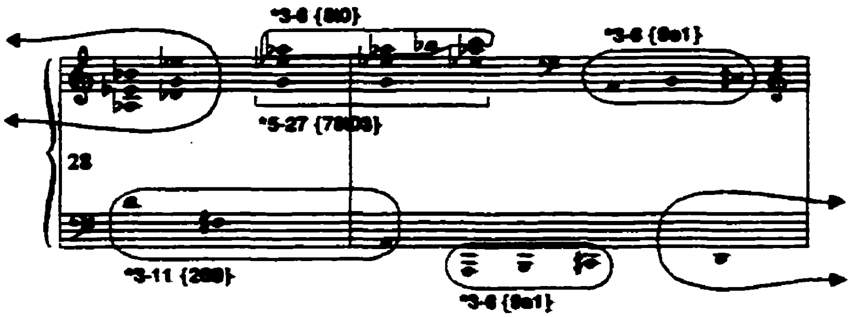
Example 3.6. Pitch reduction and segmentation of section A



Example 3.6 (continued)

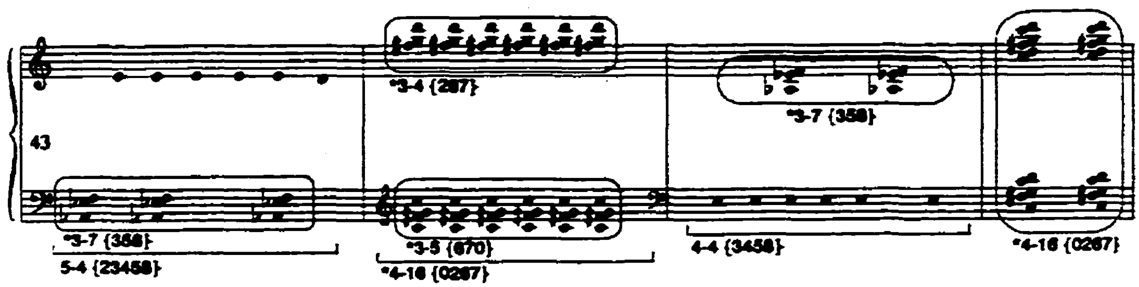


Example 3.6 (continued)

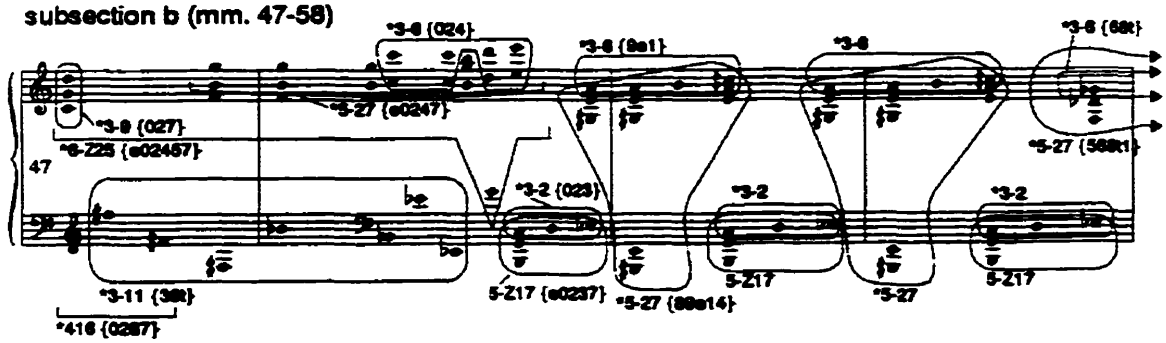


Example 3.7. Pitch reduction and segmentation of section A'

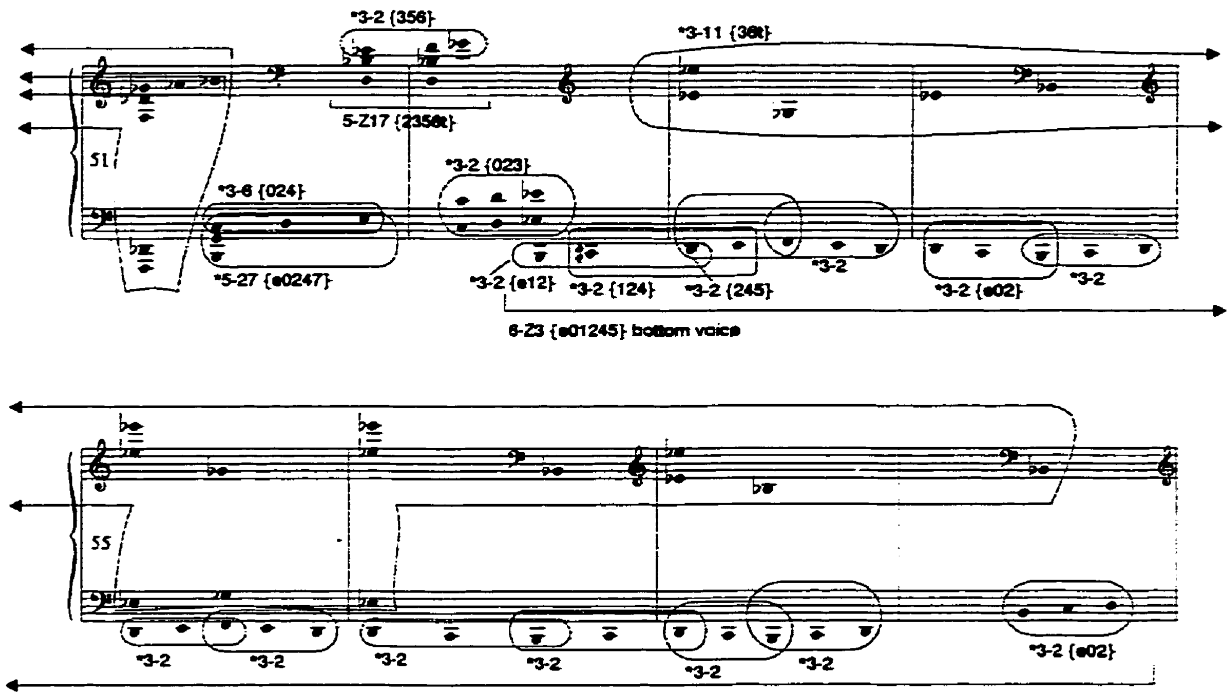
Section A' (mm. 43-62)
subsection a (mm. 43-46)



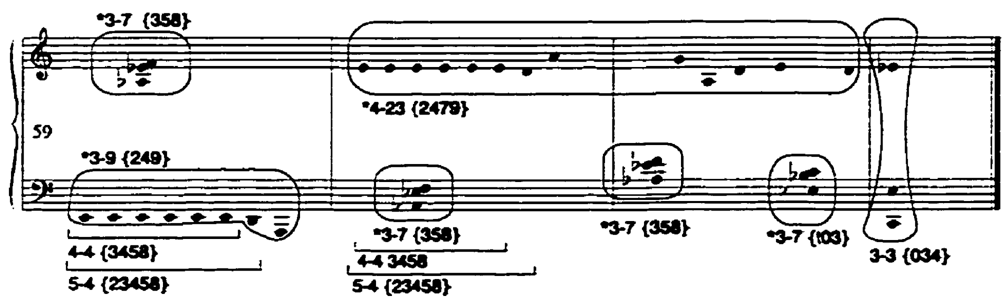
subsection b (mm. 47-58)



Example 3.7 (continued)



subsection a' (mm. 59-62)



Of the 22 scs identified in examples 3.6 and 3.7, a majority (15) are subsets of the diatonic sc 7-35. Figure 3.2 demonstrates the degree of interconnection (in the form of an inclusion matrix) among the 15 diatonic scs of sections A and A', while table 3.1 compares the maximum possible number of connections to the actual number of connections. The ratio of actual to possible connections among the diatonic scs, expressed to four decimal places, is 0.5866. (The ratio of actual to possible connections among the entire sc inventory is 0.5141 (not shown)).

Figure 3.2. Inclusion matrix of the diatonic scs contained within sections A and A'

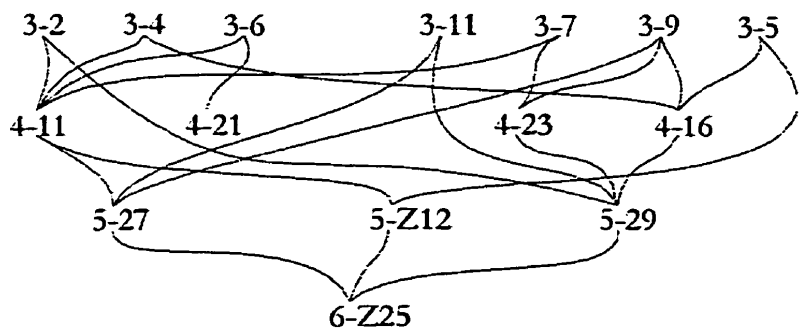


Table 3.1. Ratio of actual to possible subset/superset connections among the diatonic scs of sections A and A'

Scs	Actual	Possible
3-2	5	8
3-4	6	8
3-5	4	8
3-6	5	8
3-7	6	8
3-9	5	8
3-11	3	8
4-11	7	11
4-16	5	11
4-21	1	11
4-23	4	11
5-Z12	7	12
5-27	8	12
5-29	9	12
6-Z25	13	14
Total	88	150

Ratio = 0.5866

Unlike in the first movement, a form of sc 7-35 does not appear in sections A or A'; however, sc 7-35 effectively serves as an important (if external) referential collection. In order to support my choice of sc 7-35 as a referential sc it is useful to compare the information provided in figure 3.2 and table 3.1 with the pitch reductions presented as examples 3.6 and 3.7. For example, one of the more prominent scs presented in sections A and A', sc 3-7, stated initially in the LH in mm. 1-6, is related to the remaining diatonic scs through its 6 (out of a possible 8) connections.[8] In addition, sc 3-4, which accounts for the pc content of the LH in mm. 8-13, is also related to the remaining diatonic scs through its 6 (out of a possible 8) connections. Similarly, sc 6-Z25, presented prominently (as a composite segment) in the RH in mm. 7-8 (at the beginning of subsection b); mm. 24-25 (signifying the commencement of subsection b'); and again in mm. 47-78 (the beginning of subsection b within section A'), is also strongly connected to the remaining diatonic scs through its 13 (out of a possible 14) connections. And, finally, the presence of important diatonic scs such as 3-9 (RH mm. 7, 24, and 47) and 3-11 (LH mm. 7-8, 24-29, 47-48, and RH & LH in mm. 53-58) serves to corroborate sc 7-35's role as an important (if external) referential collection.[9]

Not only do diatonic scs account for a majority of the scs identified, but specific diatonic scs receive emphasis as a result of sequential repetition (see example 3.6). For example, in the RH in mm. 24-25, a composite segment resulting in a form of sc 5-27 {e0247}, is presented sequentially, transposed down by descending wholetones, appearing in mm. 26-27 as {9t025} and mm. 28-29 as {78t03} (these presentations include the motive <024>, <t02>, and <8t0> in the top voice, mentioned in the previous section). In addition, in mm. 25-26 and mm. 27-28 (in the RH), forms of sc 5-29, {9t035} and {78t13}

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[8] Of the nine trichordal subsets of the diatonic sc 7-35, sc 3-7 is the most strongly represented with eight distinct forms.

[9] With five distinct forms, sc 3-9 is the second-most-strongly represented trichordal subset of sc 7-35 (following sc 3-7). In addition, sc 3-9 maximizes ic 5; that is, it contains the largest number of ic 5s among the trichordal scs. This property is an important feature of the diatonic genus's characteristic scs and will be discussed in connection with the third movement.

respectively, are also presented sequentially, again related by wholetone transposition downwards.

Additional diatonic scs are presented sequentially (once again descending by wholetones) in the LH in mm. 24-27. Forms of sc 3-2, {356} and {134}, are expressed in mm. 25 and 27 respectively, while forms of sc 3-11, {36t} and {148}, precede these presentations in mm. 24 and 26 respectively. It should be noted that a presentation of sc 3-11 {269} follows in mm. 28-29; however, the final pitch (A) prevents the sequence from reaching completion (i.e., this form of sc 3-11 is related to the preceding form not by T_{10}, transposition by descending wholetones, but by inversion followed by transposition expressible as $T_{10}I$).

Seven scs identified in the pitch reductions (3-3, 4-1, 4-4, 5-4, 5-Z17, 6-Z3, and 8-6) are not subsets or supersets of the diatonic collection 7-35. They are, however, closely related to each other through inclusion. The actual connections are shown in figure 3.3 in the form of an inclusion matrix, while table 3.2 displays the ratio of actual to possible connections: 0.7368. The degree of interconnection among the non-diatonic scs is substantially greater than that of the diatonic scs; however, the non-diatonic scs account for only 7 (out of 22) scs identified.

Figure 3.3. Inclusion matrix of the non-diatonic scs contained within sections A and A'

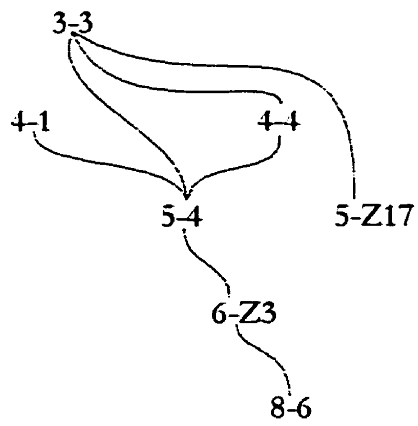


Table 3.2. Ratio of actual to possible subset/superset connections among the non-diatonic scs of sections A and A'

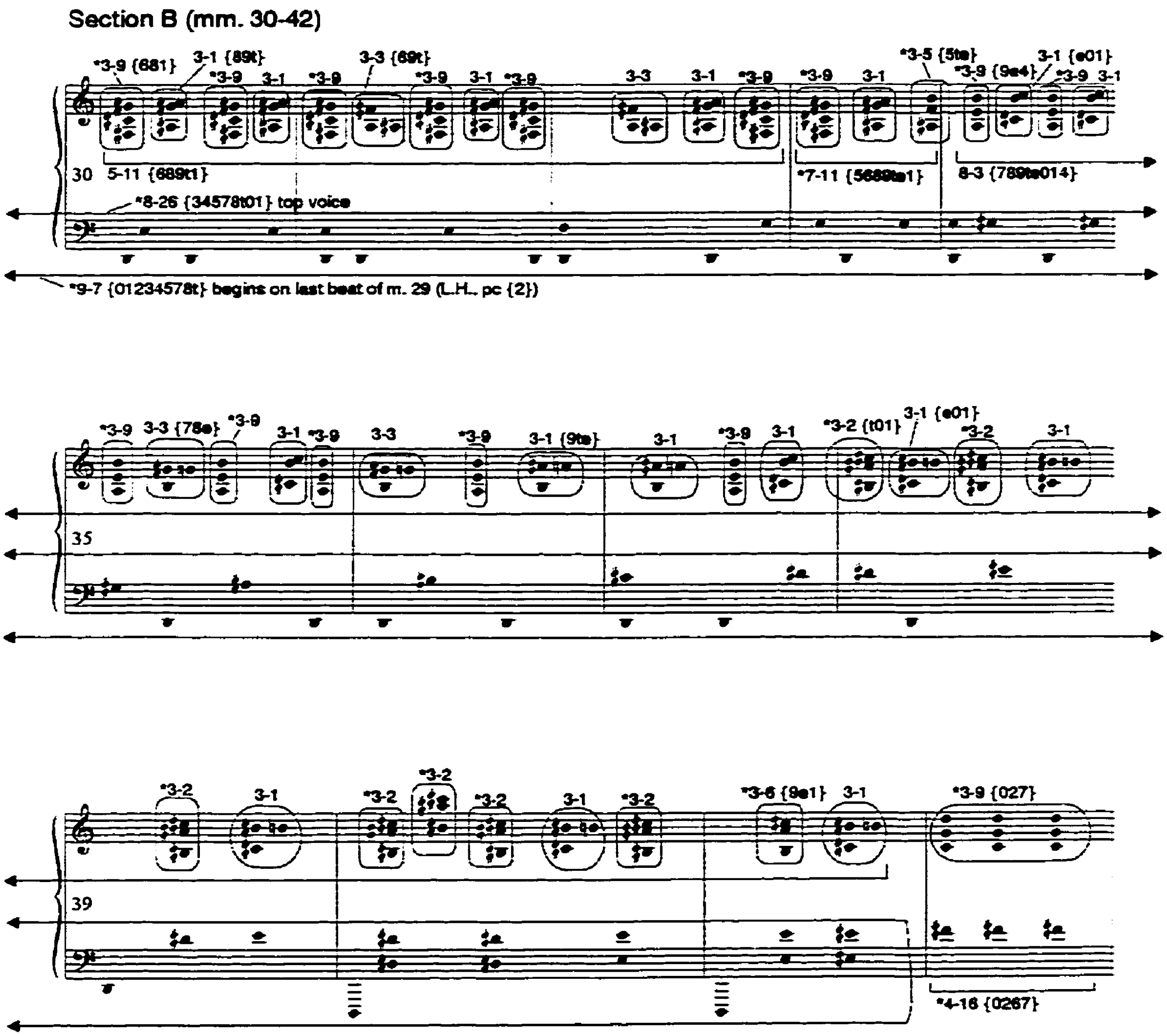
Scs	Actual	Possible
3-3	5	6
4-1	3	5
4-4	4	5
5-4	5	5
5-Z17	1	5
6-Z3	5	6
8-6	5	6
Total	28	38

Ratio = 0.7368

Section B

Example 3.8 presents a pitch reduction and segmentation of section B (mm. 30-42). Once again, in order to appreciate the degree of interconnection among the scs it is necessary to divide the sc inventory into two distinct groups: diatonic and non-diatonic scs. As in examples 3.6 and 3.7, the diatonic scs have been identified in example 3.8 with an asterisk. Like sections A and A', diatonic scs account for a majority of the scs represented within section B (8 out of 12); however, it is important to point out that for section B, diatonic scs have been identified through their subset/superset relationships to the diatonic (asymmetrical) hexachord 6-Z25, rather than the diatonic (symmetrical) heptachord 7-35 (hence the inclusion of sc 7-11). This distinction has been made for pc set-generic reasons and will be explained below.

Example 3.8. Pitch reduction and segmentation of section B



The extent to which the diatonic scs of section B are connected through inclusion is demonstrated in figure 3.4, while table 3.3 presents the ratio of actual to possible connections: 0.8636. This ratio emphasizes the very strong interconnection among the diatonic scs of section B (interconnections much stronger than those among the diatonic scs of sections A and A').

Figure 3.4. Inclusion matrix of the diatonic scs contained within section B

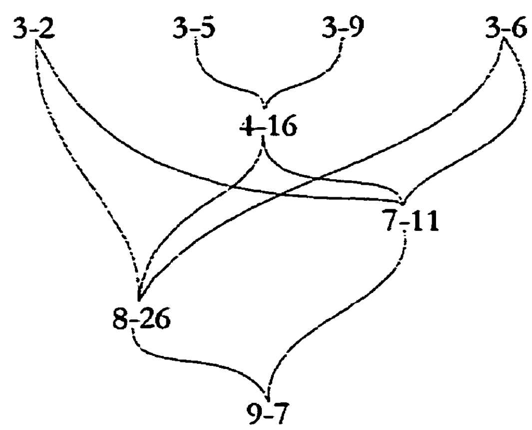


Table 3.3. Ratio of actual to possible subset/superset connections among the diatonic scs of section B

Scs	Actual	Possible
3-2	3	4
3-5	4	4
3-6	3	4
3-9	4	4
4-16	5	7
7-11	6	7
8-26	6	7
9-7	7	7
Total	38	44

Ratio = 0.8636

As figure 3.5 and table 3.4 demonstrate, the remaining scs not related by inclusion to the diatonic hexachord 6-Z25 (3-1, 3-3, 5-11, and 8-3) are *completely* related to each other through inclusion; the ratio of actual to possible connections being 1.0000.

Figure 3.5. Inclusion matrix of the non-diatonic scs contained within section B

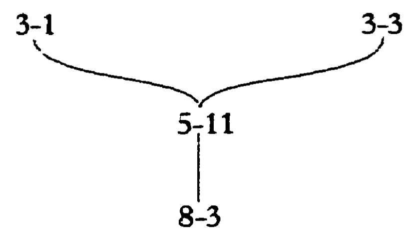


Table 3.4. Ratio of actual to possible subset/superset connections among the non-diatonic scs of section B

Scs	Actual	Possible
3-1	2	2
3-3	2	2
5-11	3	3
8-3	3	3
Total	10	10

Ratio = 1.0000

Pitch-Structural Relationships Engaged Between Contrasting Formal Sections

Before considering pc set-generic associations, three important pitch-structural relationships involving contrasting formal sections (and subsections) deserve attention. The first concerns an abstract complement relation realized at a strategic point in the movement. The relation involves the opening trichord, a form of sc 3-7{358} (section A), and its embedding complement, a form of sc 9-7 {01234578t}, presented in the LH in mm. 30-41 (section B); see examples 3.6 and 3.8. The significance of this complement relation lies in its placement; sc 9-7 is initiated by the D-pedal, which serves to signal the beginning of a new formal subdivision, section B at m. 30.[10]

Another relationship, this time involving contrasting formal subsections concerns the RH's opening motive of mm. 2-6 (subsection a), which focuses on pcs {4} and {2}, and mm. 13-14: subsection b's closing gesture (RH, mm. 13-14) presents a compressed form of the motive expressed as <32> (see example 3.6).

And finally, the pcs of section A's and A''s melodic dyad <42> are emphasized throughout section B (see example 3.8). This results from the LH's D-pedal, presented in mm. 30-41, in combination with the LH's melodic ascent (top voice) that extends from e to $e\sharp^1$ in mm. 30-38; in mm. 39-40 e^1 is emphasized through repetition and preceded by statements of $d\sharp^1$.

Pitch-Class Set-Generic Relations

The above discussion of form focused on the movement's small-scale subdivisions in order to demonstrate important motivic developments. The discussion of pc set relations focused primarily on relationships between the scs of the movement's large-scale divisions in order to demonstrate Bartók's economic use of pitch materials (both diatonic and non-diatonic). I will conclude by presenting a discussion of the movement's pc set-generic relationships taking both small- and large-scale formal divisions into account, beginning with

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[10] The D-pedal actually begins on the last beat of m. 29 and is marked *sf* in the score.

a consideration of sections A and A'. In addition, before concluding the chapter, we will consider relationships between the first and second movements.

Sections A and A'

Our previous examination of the pitch materials of sections A and A' revealed a higher degree of interconnection among the scs when the sc inventory of the two sections is divided into two groups: diatonic scs and non-diatonic scs. Focusing on these relationships of inclusion in order to demonstrate generic relationships prevalent within sections A and A' proves useful. In fact, as the following discussion will show, a complex genus about cynosural scs 7-35 and 9-1 models well all of the scs identified within the two sections. The member scs of the complex genus 7-35/9-1 are presented below in table 3.5.

Table 3.5. The complex genus 7-35/9-1

Complex Genus 7-35/9-1 (151 scs, 38 primary, 113 secondary)		
Cynosural Sc	counts	Ordinal Number/Number of Forms
7-35		
2	6	1/2 2/5 3/4 4/3 5/6 6/1
3	9	2/4 4/4 5/2 6/3 7/8 8/2 9/5 10/1 11/6
4	13	8/1 10/2 11/4 13/2 14/4 16/2 20/2 21/1 22/6 23/4 26/3 27/2 29/2
5	9	12/1 20/2 23/4 24/2 25/2 27/4 29/2 34/1 35/3
6	4	25/2 26/1 32/2 33/2
7	1	35/1
8	3	22/2 23/2 26/1
9	4	6/1 7/4 9/3 11/2
10	4	2/3 3/2 4/1 5/4
Total	53	
9-1		
2	6	1/8 2/7 3/6 4/6 5/6 6/3
3	12	1/7 2/12 3/10 4/10 5/10 6/5 7/8 8/8 9/4 10/3 11/6 12/1
4	28	1/6 2/10 3/5 4/8 5/8 6/4 7/4 8/4 9/2 10/4 11/8 12/6 13/6 14/6 15/6 16/6 17/2 18/4 19/4 20/2 21/3 22/4 23/2 24/2 25/1 26/1 27/2 29/6
5	34	1/5 2/8 3/8 4/6 5/6 6/6 7/6 8/3 9/6 10/6 11/4 12/3 13/4 14/4 15/2 16/4 17/2 18/4 19/4 20/4 21/2 22/1 23/4 24/4 25/2 26/2 27/2 28/2 29/2 30/2 33/1 36/4 37/1 38/2
6	32	1/4 2/6 3/6 4/3 5/4 6/2 7/1 8/2 9/4 10/4 11/4 12/4 13/2 14/2 15/2 16/2 17/2 18/2 19/2 21/2 22/2 23/1 24/2 25/2 26/1 36/4 37/2 38/2 39/2 40/2 41/2 43/2
7	16	1/3 2/4 3/2 4/4 5/4 6/2 7/2 8/1 9/2 11/2 13/2 14/2 15/1 36/2 37/1 38/2
8	5	1/2 2/2 4/2 5/2 6/1
9	1	1/1
10	2	1/2 2/1
Total	136	
UNION		
2	6	1/10 2/12 3/10 4/9 5/12 6/4
3	12	1/7 2/16 3/10 4/14 5/12 6/8 7/16 8/10 9/9 10/4 11/12 12/1
4	28	1/6 2/10 3/5 4/8 5/8 6/4 7/4 8/5 9/2 10/6 11/12 12/6 13/8 14/10 15/6 16/8 17/2 18/4 19/4 20/4 21/4 22/10 23/6 24/2 25/1 26/4 27/4 29/8
5	36	1/5 2/8 3/8 4/6 5/8 6/6 7/6 8/3 9/6 10/6 11/4 12/4 13/4 14/4 15/2 16/4 17/2 18/4 19/4 20/6 21/2 22/1 23/8 24/6 25/4 26/2 27/6 28/2 29/4 30/2 33/1 34/1 35/3 36/4 37/1 38/2
6	34	1/4 2/6 3/6 4/3 5/4 6/2 7/1 8/2 9/4 10/4 11/4 12/4 13/2 14/2 15/2 16/2 17/2 18/2 19/2 21/2 22/2 23/1 24/2 25/4 26/2 32/2 33/2 36/4 37/2 38/2 39/2 40/2 41/2 43/2
7	17	1/3 2/4 3/2 4/4 5/4 6/2 7/2 8/1 9/2 11/2 13/2 14/2 15/1 35/1 36/2 37/1 38/2
8	8	1/2 2/2 4/2 5/2 6/1 22/2 23/2 26/1
9	5	1/1 6/1 7/4 9/3 11/2
10	5	1/2 2/4 3/2 4/1 5/4
Total	151	
Primary scs		
2	6	1/10 2/12 3/10 4/9 5/12 6/4
3	9	[redacted] 8/10 [redacted] 10/4 [redacted]
4	13	8/5 10/6 [redacted] 13/8 14/10 [redacted] 20/4 [redacted] 22/10 [redacted] 26/4 27/4 29/8
5	7	[redacted] 20/6 23/8 24/6 25/4 [redacted]
6	2	[redacted] 26/2
7	0	
8	0	
9	0	
10	1	2/4
Total	38	
Secondary scs		
2	0	
3	3	1/7 [redacted] 12/1
4	15	[redacted] 2/10 3/5 [redacted] 5/8 6/4 7/4 9/2 12/6 15/6 17/2 18/4 19/4 24/2 25/1
5	29	1/5 2/8 3/8 [redacted] 5/6 6/8 7/6 8/3 9/6 10/6 11/4 13/4 14/4 15/2 16/4 [redacted] 18/4 19/4 21/2 22/1 26/2 28/2 30/2 33/1 34/1 35/3 36/4 37/1 38/2
6	32	1/4 2/6 [redacted] 4/3 5/4 6/2 7/1 8/2 9/4 10/4 11/4 12/4 13/2 14/2 15/2 16/2 17/2 18/2 19/2 21/2 22/2 23/1 24/2 32/2 33/2 36/4 37/2 38/2 39/2 40/2 41/2 43/2
7	17	1/3 2/4 3/2 4/4 5/4 6/2 7/2 8/1 9/2 11/2 13/2 14/2 15/1 35/1 36/2 37/1 38/2
8	8	1/2 2/2 4/2 5/2 [redacted] 22/2 23/2 26/1
9	5	1/1 6/1 7/4 9/3 11/2
10	4	1/2 3/2 4/1 5/4
Total	113	

The effectiveness of modeling the pitch materials of sections A and A' around the complex genus 7-35/9-1 is enhanced by the fact that the majority of the scs identified, 15 (out of 22) are primary members of that genus; that is, they represent member scs of the intersection of simple genera about 7-35 and 9-1.[11]

Before presenting a pc set-generic account of sections A and A' it is necessary to examine the characteristic scs of the complex genus 7-35/9-1. To facilitate this discussion the characteristic scs of the complex genus appear below as table 3.6.

Table 3.6. The characteristic scs of the complex genus 7-35/9-1

Scs	Sias	Icvs
9-1	<1-1-1-1-1-1-1-1-4>	[876663]
7-35	<1-2-2-1-2-2-2>	[254361]
6-Z26	<1-2-2-2-1-4>	[232341]
5-24	<1-2-2-2-5>	[131221]
4-21	<2-2-2-6>	[030201]
3-6	<2-2-8>	[020100]

A number of preliminary observations concerning the characteristic scs deserve mention. First, unlike the characteristic scs of the complex genus 7-34/7-35 and the simple genus 8-28, the characteristic scs of complex genus 7-35/9-1 do not contain complement pairs. This is because the complement pairs of the cynosural scs 9-1 and 7-35 (3-1 and 5-35) are not primary members of the complex genus, and I have therefore excluded them from consideration. In addition, while the characteristic scs of simple genus 8-28 and complex genus 7-34/7-35 each contain one representative from trichords through nonachords (with

[11] In addition, the seven secondary-member scs (3-3, 4-1, 4-4, 5-4, 5-Z17, 6-Z3, and 8-6) are all subsets of the cynosural sc 9-1.

the exception of the two cynosural heptachords of the latter genus, and the two hexachords of the former genus, 6-27 and 6-30), in the case of complex genus 7-35/9-1 a characteristic octachord is not possible since octachords for this genus are all secondary scs.

Close relationships between the characteristic scs, however, are still prevalent. For example, as table 3.6 demonstrates, all of the scs, with the exception of the cynosural scs themselves, are inclusion related as their respective sias indicate. In addition, within the icvs of scs 3-6 though 7-35 ascendant patterns of ic 4 are followed by ic 1: ic 4 occurs ascendant from 1 through 3, while ic 1 appears ascendant from 0 through 2. In addition, the total ic content among the six characteristic scs reveals that ic 2 is the highest (with 23 counts) while ic 5 is the second highest (with 18 counts). Of course, sc 9-1 contains the largest number of ic 1. It is also interesting to note that scs 4-21 and 3-6 display alternating descendant patterns within their icvs with respect to ics 2, 4, and 6 (e.g. 4-21 [030201] and 3-6 [020100].

Like the cynosural sc 9-1, ic 1 is the predominant ic contained within the following non-diatonic scs of sections A and A': 4-1[321000]; 4-4 [211110]; 5-4 [322111]; 6-Z3 [433221]; and 8-6 [654463]. In the case of sc 8-6, ic 5 is also strongly represented receiving as many counts as ic 1. In addition, scs from sections A and A' high in ic 2 (the most strongly represented ic among all six characteristic scs) include: 3-6 [020100]; 4-11 [121110]; and 4-21 [030201], while those high in ic 5 are: 3-9 [010020]; 4-16 [110121]; 4-23 [021030]; 5-27 [122230]; 5-29 [122131]; and 6-Z25 [233241]. The large number of scs high in ic 5 reflects the fact that there are more diatonic scs contained within the sc inventory of sections A and A' (15 out of 22), all of which are primary members of the complex genus 7-35/9-1.

Figure 3.6 outlines the pc set-generic associations of each section and their respective formal subsections.

Figure 3.6. Section A's and A''s pc set-generic relations and formal subdivisions

Section A (mm. 1-29)	Genus	Scs
subsection a (mm. 1-6)	7-35/9-1	3-7, 4-4, 5-4
subsection b (mm. 7-14}	7-35/9-1	3-2, 3-4, 3-6, 3-9, 3-11, 4-11, 4-16, 4-21, 5-Z12, 5-27, 6-Z25
subsection a' (mm. 15-23)	7-35/9-1	3-5, 3-7, 4-1, 4-4 4-23
subsection b' (mm. 24-29)	7-35/9-1	3-2, 3-6, 3-9, 3-11 4-11, 4-16, 5-27, 5-29, 6-Z25
Section A' (mm. 42-62)	Genus	Scs
subsection a (mm. 43-46)	7-35/9-1	3-4, 3-5, 3-7, 4-4 4-16, 5-4
subsection b (mm. 47-58)	7-35/9-1	3-2, 3-6, 3-9, 3-11 4-16, 5-Z17, 5-27 6-Z3, 6-Z25
subsection a' (mm. 59-62)	7-35/9-1	3-3, 3-7, 4-4, 4-23 5-4

Section B

The pitch materials of section B are closely related through inclusion, a relationship made apparent by dividing the sc inventory into two distinct groups: diatonic and non-diatonic scs. As mentioned above, the diatonic scs of section B have been determined on the basis of their subset/superset relationships to the asymmetrical diatonic hexachord 6-Z25, rather than the symmetrical diatonic heptachord 7-35. Up to this point, all of the genera have employed symmetrical cynosural scs (7-34, 7-35, 8-28, and 9-1). However, in the case of section B, the non-diatonic pitch materials cannot all be accounted for by the symmetrical nonachord 9-1. They can, however, be accounted for by the asymmetrical pentachord 5-11. A form of sc 5-11 {689t1} is expressed as a composite segment in the RH in mm. 30-32, while its abstract complement is expressed (also as a composite segment in the RH) in m. 33 (see example 3.8). To accompany the asymmetrical sc 5-11, the asymmetrical sc 6-Z25 has been invoked as a diatonic counterpart resulting in the complex genus 6-Z25/5-11, used to model the pitch materials of section B. Incorporating the diatonic hexachord 6-Z25 into our complex genus not only assures a degree of consistency among the cynosural scs themselves, but it also has significance in terms of the diatonic scs presented in section B. Of the eight diatonic scs identified, five (3-2, 3-5, 4-16, 7-11, and 9-7) are asymmetrical subsets or supersets of sc 6-Z25. The member scs of the complex genus 6-Z25/5-11 are presented below as table 3.7.

Table 3.7. The complex genus 6-Z25/5-11

Complex Genus 6-Z25/5-11 (112 scs, 43 primary, 69 secondary)		
Cynosural Sc	counts	Ordinal Number/Number of Forms
6-Z25		
2	6	1/2 2/3 3/3 4/2 5/4 6/1
3	9	2/3 4/3 5/2 6/1 7/4 8/1 9/2 10/1 11/3
4	12	8/1 10/1 11/2 13/2 14/2 16/1 20/1 22/1 23/1 26/1 27/1 29/1
5	6	12/1 20/1 23/1 25/1 27/1 29/1
6	1	25/1
7	6	11/1 14/1 29/1 32/1 35/1 36/1
8	13	2/1 4/1 6/1 13/1 14/1 15/1 16/1 17/1 18/1 22/2 23/2 26/1 27/1
9	11	1/1 2/1 3/2 4/1 5/2 6/1 7/4 8/1 9/3 10/1 11/3
10	6	1/2 2/3 3/3 4/2 5/4 6/1
Total	70	
5-11		
2	5	1/2 2/2 3/2 4/2 5/2
3	8	1/1 2/1 3/2 4/1 6/1 7/1 9/1 11/2
4	5	2/1 4/1 14/1 17/1 22/1
5	1	11/1
6	7	8/1 10/1 14/1 16/1 36/1 46/1 47/1
7	18	2/2 3/1 4/1 6/1 10/1 11/2 12/1 13/1 17/1 20/1 21/1 23/2 25/1 26/1 27/1 29/1 30/1 37/1
8	23	1/1 2/2 3/1 4/3 5/1 7/1 8/1 10/2 11/3 12/1 13/2 14/3 15/1 16/1 17/1 19/3 20/1 22/2 23/1 24/1 26/1 27/1 29/1
9	12	1/2 2/5 3/4 4/5 5/2 6/2 7/5 8/2 9/2 10/1 11/4 12/1
10	6	1/4 2/4 3/4 4/4 5/4 6/1
Total	85	
UNION		
2	6	1/4 2/5 3/5 4/4 5/6 6/1
3	11	1/1 2/4 3/2 4/4 5/2 6/2 7/5 8/1 9/3 10/1 11/5
4	15	2/1 4/1 8/1 10/1 11/2 13/2 14/3 16/1 17/1 20/1 22/2 23/1 26/1 27/1 29/1
5	7	11/1 12/1 20/1 23/1 25/1 27/1 29/1
6	8	8/1 10/1 14/1 16/1 25/1 36/1 46/1 47/1
7	22	2/2 3/1 4/1 6/1 10/1 11/3 12/1 13/1 14/1 17/1 20/1 21/1 23/2 25/1 26/1 27/1 29/2 30/1 32/1 35/1 36/1 37/1
8	25	1/1 2/3 3/1 4/4 5/1 6/1 7/1 8/1 10/2 11/3 12/1 13/3 14/4 15/2 16/2 17/2 18/1 19/3 20/1 22/4 23/3 24/1 26/2 27/2 29/1
9	12	1/3 2/6 3/6 4/6 5/4 6/3 7/9 8/3 9/5 10/2 11/7 12/1
10	6	1/6 2/7 3/7 4/6 5/8 6/2
Total	112	

Table 3.7 (continued)

Primary scs		
2	5	1/4 2/5 3/5 4/4 5/6
3	6	[redacted] 4/4 [redacted] 7/5 [redacted] 11/5
4	2	14/3 22/2
5	0	
6	0	
7	2	[redacted] 29/2
8	11	2/3 4/4 13/3 14/4 15/2 16/2 17/2 22/4 23/3 [redacted] 27/2
9	11	1/3 2/6 3/5 4/6 5/4 6/3 [redacted] 8/3 9/5 10/2 11/7
10	6	1/6 2/7 3/7 4/6 5/8 6/2
Total	*43*	
Secondary scs		
2	1	6/1
3	5	[redacted] 8/1 10/1
4	13	2/1 4/1 8/1 10/1 11/2 13/2 [redacted] 17/1 20/1 23/1 26/1 27/1 29/1
5	7	[redacted] 12/1 20/1 23/1 25/1 27/1 29/1
6	8	8/1 10/1 14/1 16/1 25/1 36/1 46/1 47/1
7	20	2/2 3/1 4/1 6/1 10/1 12/1 13/1 14/1 17/1 20/1 21/1 23/2 25/1 26/1 27/1 30/1 32/1 35/1 36/1 37/1
8	14	1/1 [redacted] 5/1 6/1 7/1 8/1 10/2 11/3 12/1 18/1 19/3 20/1 24/1 29/1
9	1	12/1
10	0	
Total	*69*	

Table 3.8 presents a list of the complex genus's characteristic scs. Unlike the characteristic scs of the complex genus 7-35/9-1, those of the complex genus 6-Z25/5-11 do cluster in symmetrical pairs on either side of the cynosural scs. In addition, all of the characteristic scs are asymmetrical.

Table 3.8. The characteristic scs of the complex genus 6-Z25/5-11

Scs	Sias	Icvs
9-2	<1-1-1-1-1-1-1-2-3>	[777663]
8-14	<1-1-2-1-1-1-2-3>	[555562]
7-11	<1-2-1-1-1-2-4>	[444441]
6-Z25	<1-2-2-1-2-4>	[233241]
5-11	<2-1-1-3-5>	[222220]
4-14	<2-1-4-5>	[111120]
3-2	<1-2-9>	[111000]

With the exception of the cynosural scs themselves, the characteristic scs are related by inclusion as their sias indicate. In addition, ascendant patterns of ics 2 and 3 among scs 3-2 through 8-14 result: ics 2 and 3 occur ascendant (in identical formations) from 1 through 5. The total ic content of the seven characteristic scs reveals that ic 5 is the highest (with 24 counts) followed by ics 2 and 3 (each with 23 counts). And, finally, as the icvs of scs 3-2, 5-11, and 7-11 indicate, all of the ics represented are evenly distributed (with the exception of ic 6 in sc 7-11).

Examination of the sc inventory of section B reveals a number of interesting parallels in comparison with the characteristic scs of the complex genus 6-Z25/5-11. For example, among the twelve scs identified, five display an even distribution among their representative ics: 3-2 [111000]; 3-5 [100011]; 3-11 [001110]; 5-11 [222220]; and (with the exception of ic 6), 7-11 [444441].[12] In addition, sc 9-7 [677673] contains a predominance of ics 2, 3, and 5; sc 8-26 [456562] a predominance of ics 3 and 5; sc 4-16 [110121] a predominance of ic 5; sc 3-9 [010020] a predominance of ic 5; and, sc 3-6 [020100] a predominance of ic 2.

Although the sc inventory of section B is evenly divided in terms of primary versus secondary scs (scs 3-2, 3-6, 3-9, 7-11, 8-26, and 9-7 are primary scs and scs 3-1, 3-5, 3-11, 4-16, 5-11 and 8-3 are secondary scs; see table 3.7), three of the six primary scs identified: 3-2, 5-11, and 7-11 are also characteristic scs of the complex genus 6-Z25/5-11. Figure 3.7 presents a summary of section B's pc set-generic relations.

Figure 3.7. Section B's pc set-generic relations

Section B	Genus	Scs
mm. 30-42	6-Z25/5-11	3-1, 3-2, 3-3, 3-5 3-6, 3-9, 4-16, 5-11 7-11, 8-3, 9-7

Relationships Between The Movements

Before concluding this chapter let us observe two interesting relationships between the first two movements, the first of which involves the projection of pc {4}. The second movement's opening motivic dyad <42> stated prominently in mm. 2-6 (and elsewhere) emphasizes pc {4} through repetition. Pitch-class {4} also appears prominently, in the LH, in mm. 1-13 of the first movement, embedded in a form of sc 3-11 {48e} (i.e., as the root of

[12] Although even distributions among the icvs of trichords are rather common (a feature of 7 out of the 12 possible trichords), among each of the 38 pentachords and heptachords even distributions are much rarer.

a major triad) where it is presented in alternation with a form of sc 3-3 {te2}. In addition, during our examination of the first movement's recapitulation, we observed that the opening motive was re-introduced beginning on pc {4} rather than pc {8}, corresponding to the exposition's presentation of the motive at m. 13, rather than m. 1. And finally, pc {4} also concluded the first movement (in the RH), culminating in the presentation of a form of the octatonic sc 5-16 {12458}.

The second relationship concerns Bartók's incorporation of the first theme's three-note motive into the motivic material of the second movement. Although this relationships has already been mentioned (see footnote 7 above), there are further parallels between the way in which various forms of the motive are presented within each movement. For instance, the overlapping entries of the ascending three-note motive (forms of sc 3-2), in mm. 51-52 of the second movement, resemble Bartók's treatment of the motive leading up to the first movement's recapitulation in mm. 186-87 (cf. examples 3.7 and 2.12). And, in a more general sense, the second movement's presentation of the motive in the LH, in mm. 53-58, in which various overlapping statements of the three-note motive are presented in both ascending and descending formations—expressed as either {e12}, [124], {245}, or {e02}—reflects Bartók's development of the motive as it was presented throughout the first-theme area of movement 1.

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The second movement presents a unique challenge for the analyst. For example, although relationships between the first and second movements have been noted, on the whole the second movement's pc set contents and pc set-generic associations (specifically, its incorporation of a larger number of scs that fall outside the spectrum of the diatonic and octatonic collections) set it apart from the preceding movement. In addition, because the non-diatonic scs permeate the entire movement (i.e., they transcend formal boundaries), a correlation between the movement's pitch materials (generic characteristics) and its formal subdivisions is not as apparent as it was in the previous movement. However, this chapter has attempted to demonstrate that through a detailed examination of the movement's formal subdivisions, thematic associations, pc sets, and pc set-generic relationships it is possible to uncover large-scale structural interconnections that contribute to this movement's coherence.

CHAPTER 4

THE THIRD MOVEMENT OF THE SONATA FOR PIANO (1926)

Form

Paul Wilson observes that the third movement "...is a variant of rondo form in which changes in harmonic setting, rather than a true change of theme, mark out the separate sections."[1] Konoval, on the other hand, views the third movement as a variation of rondo form characterized both by varied repetitions of the opening theme, or reprise, and contrasting thematic material.[2] My own formal plan, presented as figure 4.1, favours Konoval's interpretation over Wilson's with respect to thematic design. The plan incorporates Konoval's notion of a reprise—of material presented initially in mm. 1-19—defined by its varied repetitions at mm. 92, 157, and 248. In addition, unlike Wilson's, my plan acknowledges the movement's incorporation of a contrasting theme.[3] As figure 4.1 illustrates, I have divided the movement into twelve sections. I have also indicated prominent thematic connections between particular sections. For example, sections 1, 4, 7,

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[1] Wilson, *The Music of Béla Bartók*, 78.

[2] Konoval, *An Analytical Study*, 135.

[3] Wilson views the material in mm. 20-37 as a variation on the opening theme. While I acknowledge that similarities between the two themes exist (such as texture, rhythm, and to a degree, phrase structure), I feel that Wilson's plan fails to recognize the genuine contrast provided by theme B (to be examined below). This contrast not only serves to inform the movement's thematic design but is also reflected at the level of pitch organization as this chapter's following sections will demonstrate.

and 11 correspond to theme A and its three varied reprises (indicated on the formal plan as "A" and "A-reprise" respectively); sections 2, 5, and 8 correspond to theme B and its two varied reprises (indicated as "B" and "B-reprise" respectively); and sections 3, 6, 9, and 10 each correspond to a unique variant of theme A (labeled "A-variant" and numbered 1-4 respectively). The final section, section 12, functions as a coda.

Figure 4.1. Formal plan of the third movement

Section 1, mm. 1-19 (A)				
period		period		
first phrase (4)	second phrase (4)	third phrase (4)	fourth phrase (4)	transition (3)

Section 2, mm. 20-48 (B)		
period		
first phrase (4)	second phrase (4)	transition (21)

Section 3, mm. 49-91 (A-variant no.1)	
first statement (25)	second statement (18)

Section 4, mm. 92-110 (A-reprise)				
period		period		
first phrase (4)	second phrase (4)	third phrase (4)	fourth phrase (4)	transition (3)

Section 5, mm. 111-138 (B-reprise "inverted")				
period		period		
first phrase (4)	second phrase (4)	third phrase (4)	fourth phrase (4)	transition (12)

Figure 4.1 (continued)

Section 6, mm. 139-156 (A-variant no. 2)	
first statement (10)	second statement (8)

Section 7, mm. 157-175 (A-reprise)			
period			
first phrase (4)	second phrase (4)	third phrase (4)	transition (7)

Section 8, mm. 175-200 (B-reprise)	
first phrase (4)	transition (22)

Section 9, mm. 201-226 (A-variant no. 3)	
first statement (11)	second statement (15)

Section 10, mm. 227-247 (A-variant no.4)	
first statement (5)	second statement (16)

Section 11, mm. 248-264 (A-reprise)						
period		phrase group				
first phrase (4)	second phrase (4)	phrase 1 (2)	phrase 2 (2)	phrase 3 (2)	phrase 4 (2)	transition (1)

Section 12, mm. 265-281 (Coda)		
first phrase (4)	second phrase (5)	third phrase (8)

Our discussion of form will begin with an examination of theme A and the coda, and will be followed by an examination of the contrasting theme B. The section concludes with an examination of the four variants of theme A.

Theme A and the Coda

Theme A is defined in part by its phrase structure. In fact, Bartók's attention to phrase structure aids in establishing contrast between formal divisions while also serving as an important source of variation among related sections. The theme is presented in mm. 1-8 and is restated (slightly varied through registral shifts and voice doublings) in mm. 9-16. Each statement is grouped into two four-measure phrases, defined by melodic repetition. Consequently, theme A is presented symmetrically as two statements each lasting eight measures and referred to metaphorically as a period. The series of repeated chords in mm. 17-19 acts as a transition leading into the contrasting section (theme B) at m. 20.

The restatement of the theme in mm. 92-110 also makes use of regular phrase lengths. In fact, an exact repetition of the first period occurs in mm. 92-99. Of particular interest, however, is the second restatement of the theme in mm. 100-107. Although this time the theme has been varied, its symmetrical phrase structure resembles the second period of the initial restatement of the theme in mm. 9-16: once again the theme is presented as two four-measure phrases. As was the case in mm. 17-19, the series of repeated chords in mm. 108-110 acts as a transition leading into the contrasting section (theme B's reprise) at m. 111.

Unlike the previous reprise, the initial restatement of the theme in mm. 157-164 is altered. However, its role as a reprise is bolstered by both its similarity to theme A (with respect to pc content) and its symmetrical presentation as two four-measure phrases.

However, in mm. 169-175 the paradigm of the four-measure phrase begins to break down. The varied repetition of the second thematic statement in mm. 165-168 is followed by a seven-measure phrase that elides with the opening phrase of theme B (reprise), beginning at m. 175.

The movement's conclusion is initiated by a final presentation of theme A beginning at m. 248. The theme is stated over the course of eight measures, where it is once again presented as two four-measure phrases. Like the previous reprise, the second thematic statement in mm. 256-264 does not follow the established pattern of the four-measure phrase length. Rather, its phrase structure is fragmented, resulting in four two-measure phrases followed by the block chords at m. 264. The final section, mm. 265-281, serves as a coda. The section is distinguished from the previous sections by the rhythmic ostinato of eighth notes in the LH and by the performance instructions *accelerando al vivacissimo,* beginning at m. 264. The coda's motoric rhythmic drive brings the movement to an exciting close.

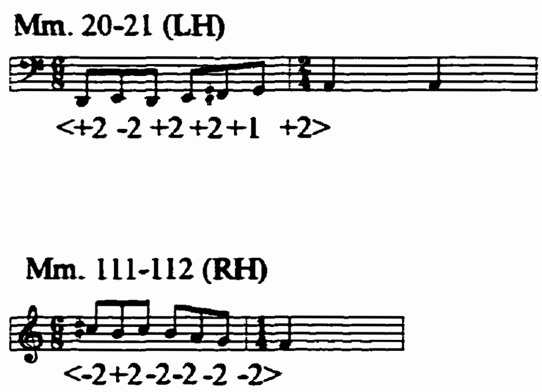
Bartók's use of regular four-measure phrases during the initial presentation of the theme and its reprises helps to ensure thematic identity. In addition, his manipulation of phrase structure following the initial presentation of the theme within the third and fourth reprises provides an important source of variety among otherwise closely related sections.

Theme B

Theme B is first presented in mm. 20-48. The opening measures are both similar to and contrast with the initial statement of theme A in mm. 1-8. For example, the phrase structure of theme B's opening statement consists of two four-measure phrases (mm. 20-27). In addition, the homophonic texture is similar except that in mm. 20-27 the LH carries the melody while the RH provides the chordal accompaniment. However, the similarities end at m. 27. Rather than repeating the first two phrases, theme B is substantially developed in mm. 28-48. Moreover, for the remainder of the theme, regular four-measure phrases no longer predominate.

When the B material returns at m. 111, it is altered. The first two measures of the RH present the theme (this time transposed to $c\sharp^2$) in what appears to be an inverted form. Indeed, the two statements (LH mm. 20-21 and RH mm. 111-112) are inverted with respect to melodic contour; however, the inversion is not a true intervallic inversion as a consequence of the RH's final two pitches (see example 4.1). Nevertheless, the close relationship between the two statements is apparent. It is interesting to note, however, that Bartók—perhaps as a result of having altered the theme—briefly returns to the symmetrical phrase structure of theme A. Theme B, now in its "inverted form," is presented twice: first in the RH (mm. 111-118) as two four-measure phrases, and then in the LH (mm. 119-126) as two four-measure phrases. This symmetrical presentation of the theme, however, does not continue past m. 126.

Example 4.1. The melodic contour and intervallic structure of mm. 20-21 and 111-112



Theme B's final reprise occurs in mm. 175-200. Once again the theme is varied (mm. 175-178). In addition, although the initial portion of the theme is presented as a four-measure phrase in mm. 175-178, the remaining phrases are irregular in length.

Differences in both pitch content[4] and phrase structure between the two themes play an important role in providing thematic contrast within the movement. As a result, I argue that Wilson's interpretation of theme B, which he considers to be a variant of theme A, fails to recognize the genuine degree of contrast provided by the two themes.

The Four Variants of Theme A

The four remaining sections each present distinct variants of theme A (see example 4.2). Following László Somfai, Konoval describes the first three variants as "Folk variant no. 1: vocal style," "Folk variant no. 2: peasant flute style," and "Folk variant no. 3: peasant fiddle style."[5] These descriptive phrases seem reasonable in their attempt to capture the unique quality of each thematic variant and I have therefore borrowed them for example 4.2. By extension, I have applied the description "Folk variant no. 4: vocal style" to the final variant presented in mm. 227-247.[6]

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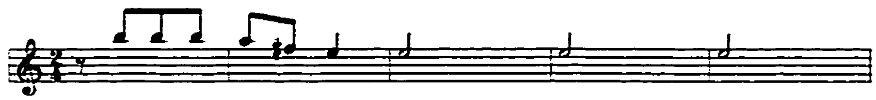
[4] Pitch materials will be examined shortly.

[5] Konoval, *An Analytical Study*, 135. For a discussion on the relationships between various folk genres and the third movement see Somfai, "The Influence of Peasant Music on the Finale of Bartók's Piano Sonata," in *Studies in Musical Sources and Style: Essays in Honor of Jan LaRue*, ed. Eugene K. Wolf and Edward H. Roesner (Madison: A-R Editions, 1990), 535-555.

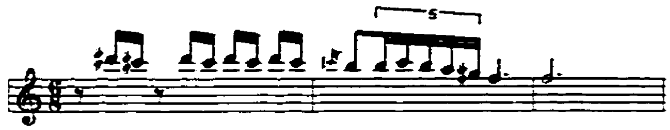
[6] Konoval refers to mm. 227-247 as a variant over a "dominant pedal." See *An Analytical Study*, 135.

Example 4.2. Four variants of the opening theme

Folk variant no. 1 ("vocal style")

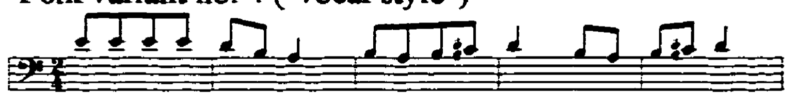


Folk variant no. 2 ("peasant flute style")



Folk variant no. 3 ("peasant fiddle style")

Folk variant no. 4 ("vocal style")



Pitch-Class Set Relations

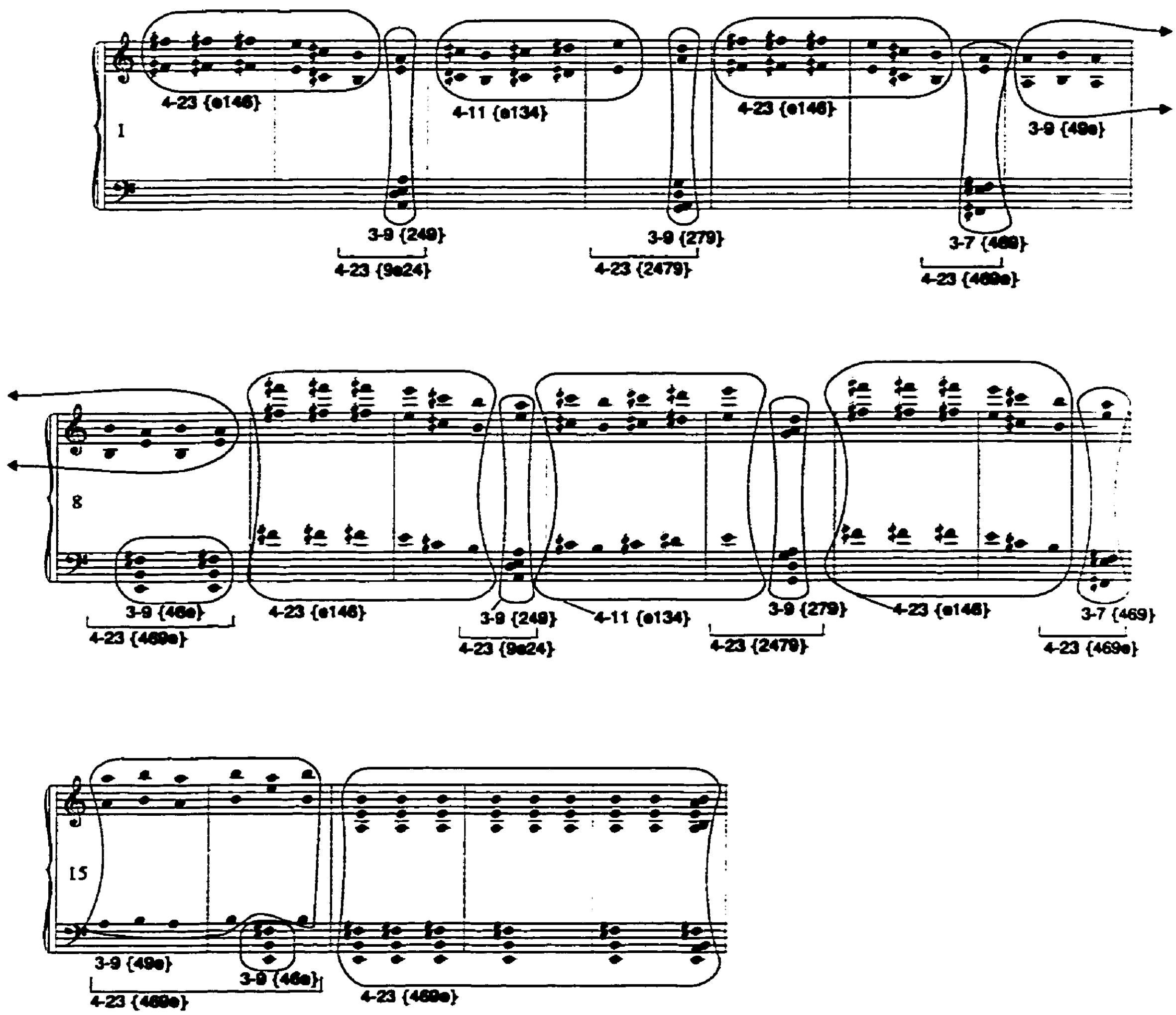
Our examination of pc set relations begins with a consideration of theme A and the coda followed by theme B and the four variants of theme A. I will demonstrate that sections corresponding with respect to thematic material evince a significant amount of interrelation in terms of inclusion. I will also examine similarities as well as differences between and among sectional divisions.

Theme A and the Coda

As noted above, theme A is defined in part by its symmetrical phrase structure. Internal structure with respect to theme A is also apparent within its pitch resources. Example 4.3 presents a pitch reduction and segmentation for each of the four statements of the theme as outlined above in figure 4.1 (section 1, mm. 1-19; section 4, mm. 92-110; section 7, mm. 157-175; and section 11, mm. 248-264). The example also includes a pitch reduction and segmentation of the coda (section 12, mm. 265-281). Although the coda does not reintroduce thematic material from either theme A or theme B, its pitch materials, as we shall see, are closely related to those of theme A. Once again, my segmentation strategy (for the entire movement) relies on primary segments.

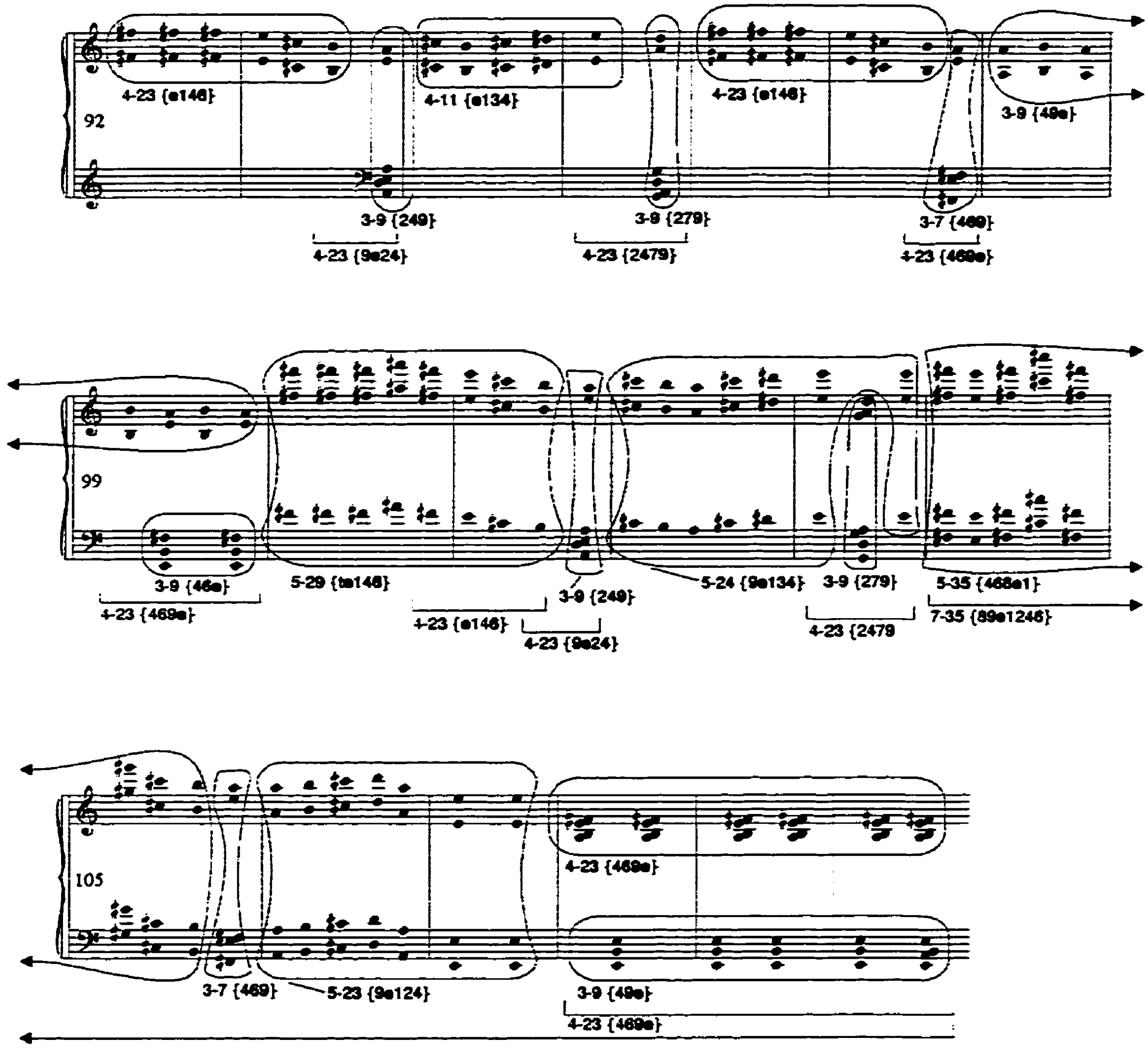
Example 4.3. Pitch reduction and segmentation of theme A and the coda

Section 1, mm. 1-19 (A)



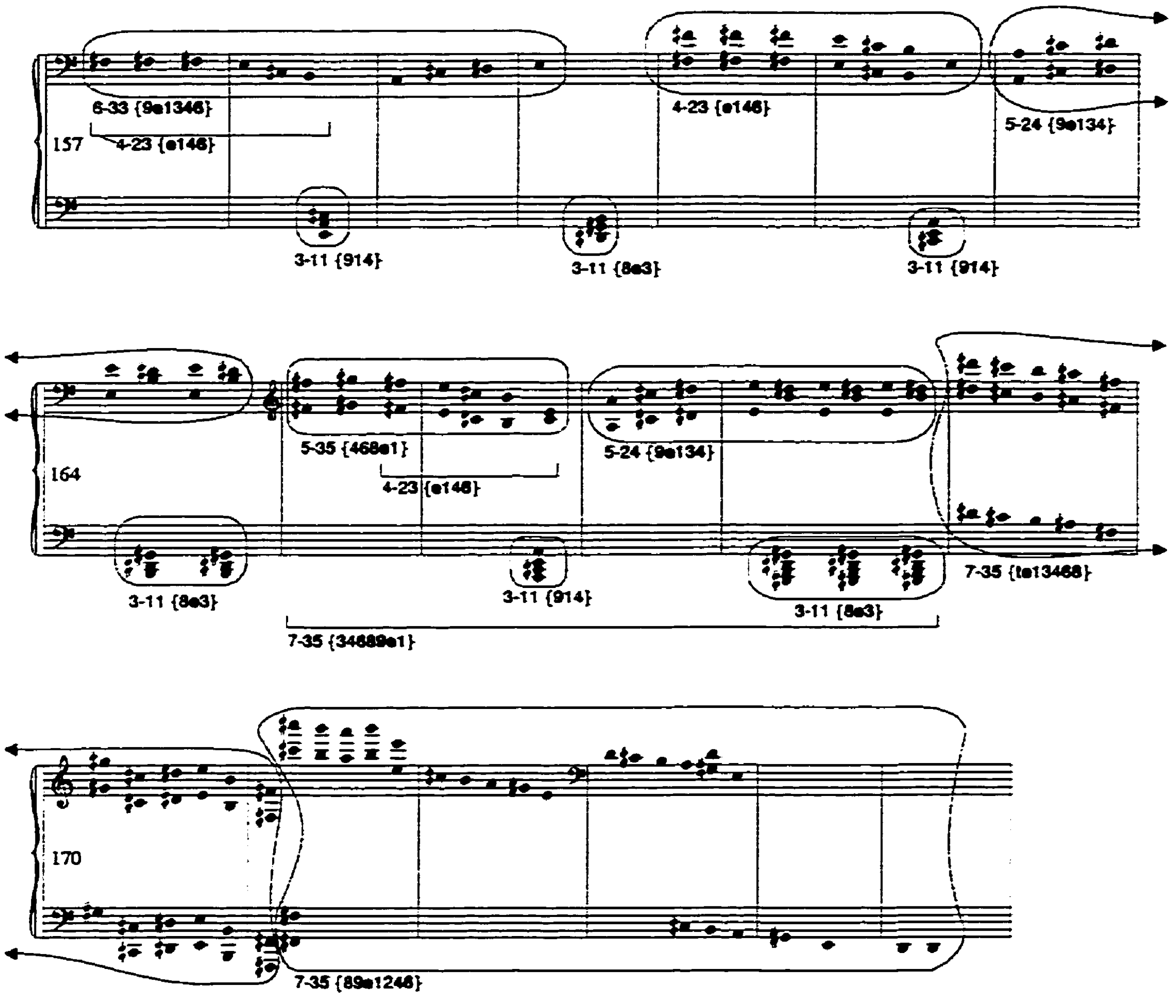
Example 4.3 (continued)

Section 4, mm. 92-110 (A-reprise)



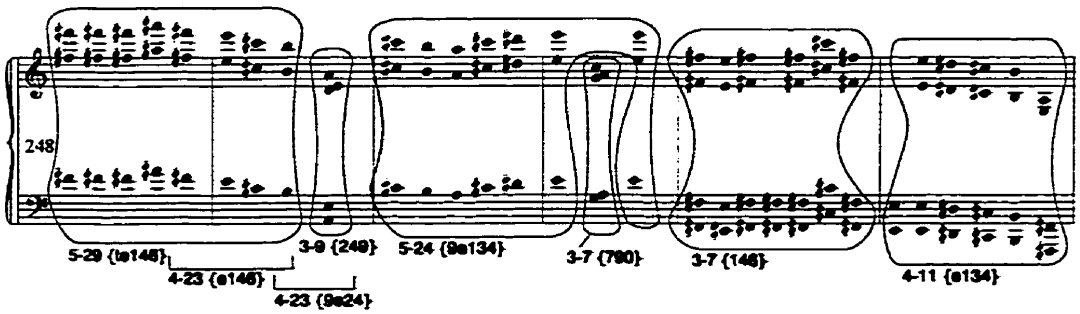
Example 4.3 (continued)

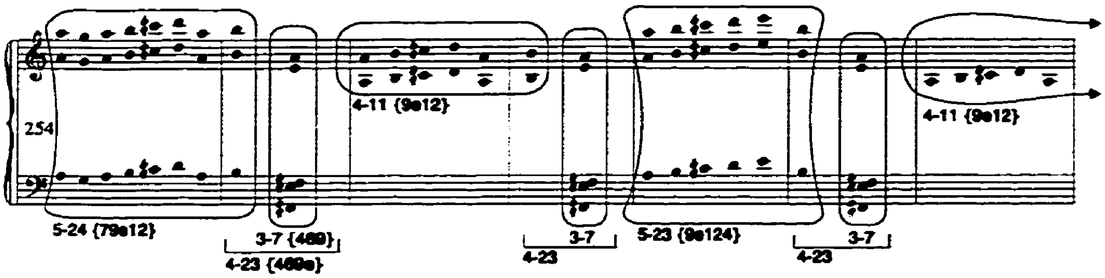
Section 7, mm. 157-175 (A-reprise)

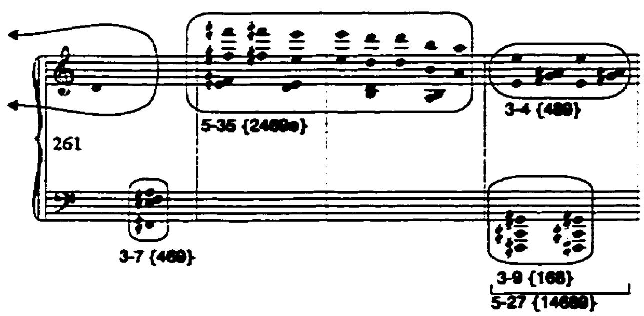


Example 4.3 (continued)

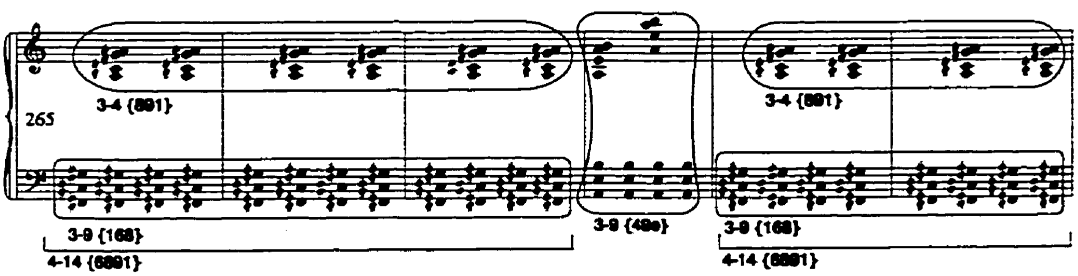
Section 11, mm. 248-264 (A-reprise)



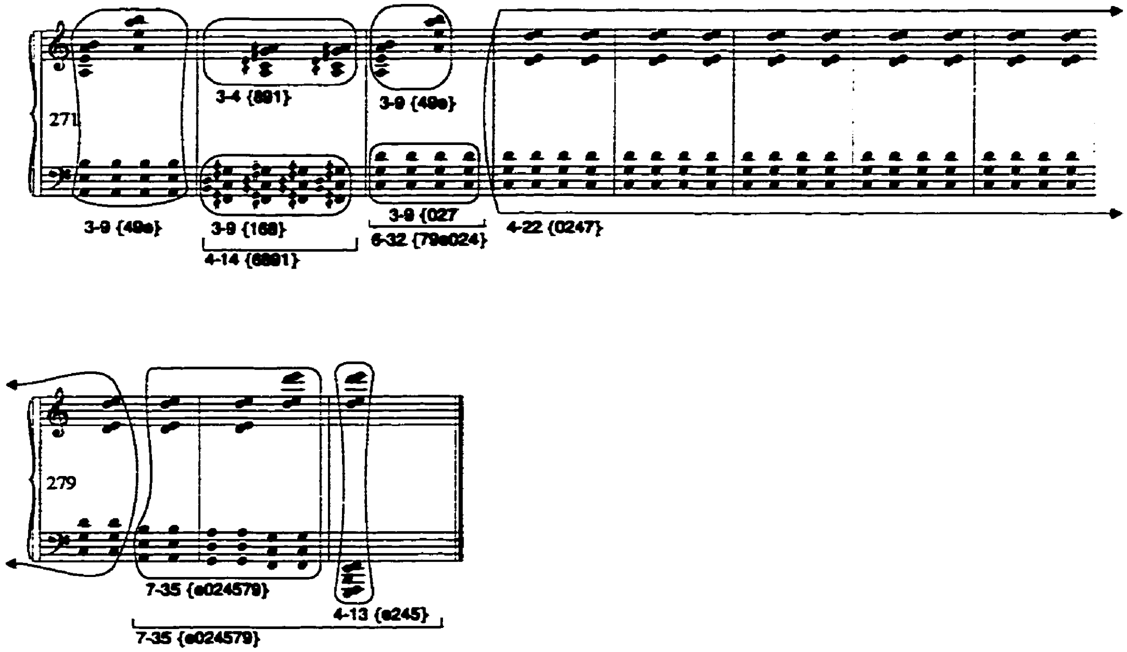




Section 12, mm. 265-281 (Coda)



Example 4.3 (continued)



In his analysis of the opening measures (mm. 1-8) Wilson comments on the "...remarkable homogeneity of harmonic vocabulary."[7] For example, as Wilson points out, not only is a form of sc 4-23 {e146} presented (melodically) in the RH in mm. 1-2 and mm. 5-6, but forms of sc 4-23 provide harmonic support in mm. 1-8 (see example 4.3). Consequently, both phrase structure and pitch structure serve to provide a source of internal consistency within the theme. Moreover, all of the pitch materials contained within theme A's various presentations (and the coda) are diatonic to the extent that the scs they embody represent subsets or supersets of the diatonic collection 7-35. The significance of this will be addressed in the following section.

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[7] Wilson, *The Music of Béla Bartók*, 79.

Not only do the scs identified within theme A (and the coda) represent subsets or supersets of the diatonic collection 7-35, but they are themselves closely related by means of inclusion. This can be seen in figure 4.2, which presents an inclusion matrix for the scs identified. The degree of interconnection among the scs is also shown in table 4.1, which identifies the ratio of actual to possible connections: 0.7660.

Figure 4.2. Inclusion matrix for the scs of theme A and the coda

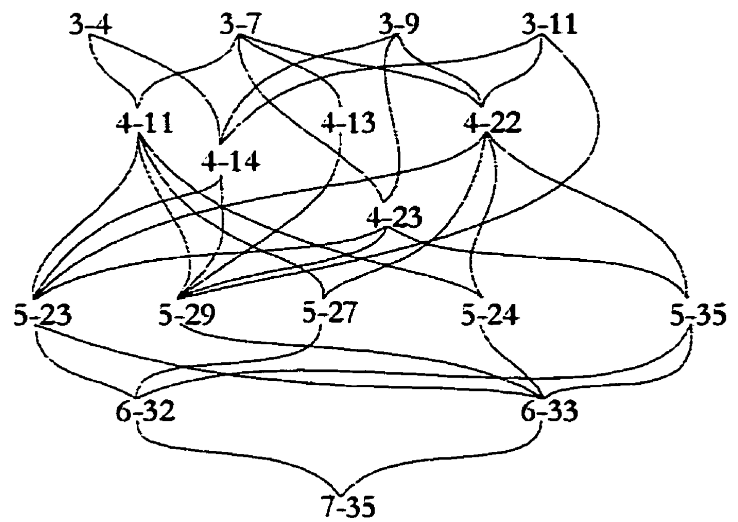


Table 4.1. Ratio of actual to possible subset/superset connections among the scs of theme A and the coda

Scs	Actual	Possible
3-4	9	13
3-7	12	13
3-9	11	13
3-11	10	13
4-11	8	12
4-13	4	12
4-14	8	12
4-22	10	12
4-23	8	12
5-23	11	12
5-24	8	12
5-27	9	12
5-29	9	12
5-35	8	12
6-32	12	15
6-33	14	15
7-35	16	16
Total	167	218

Ratio = 0.7660

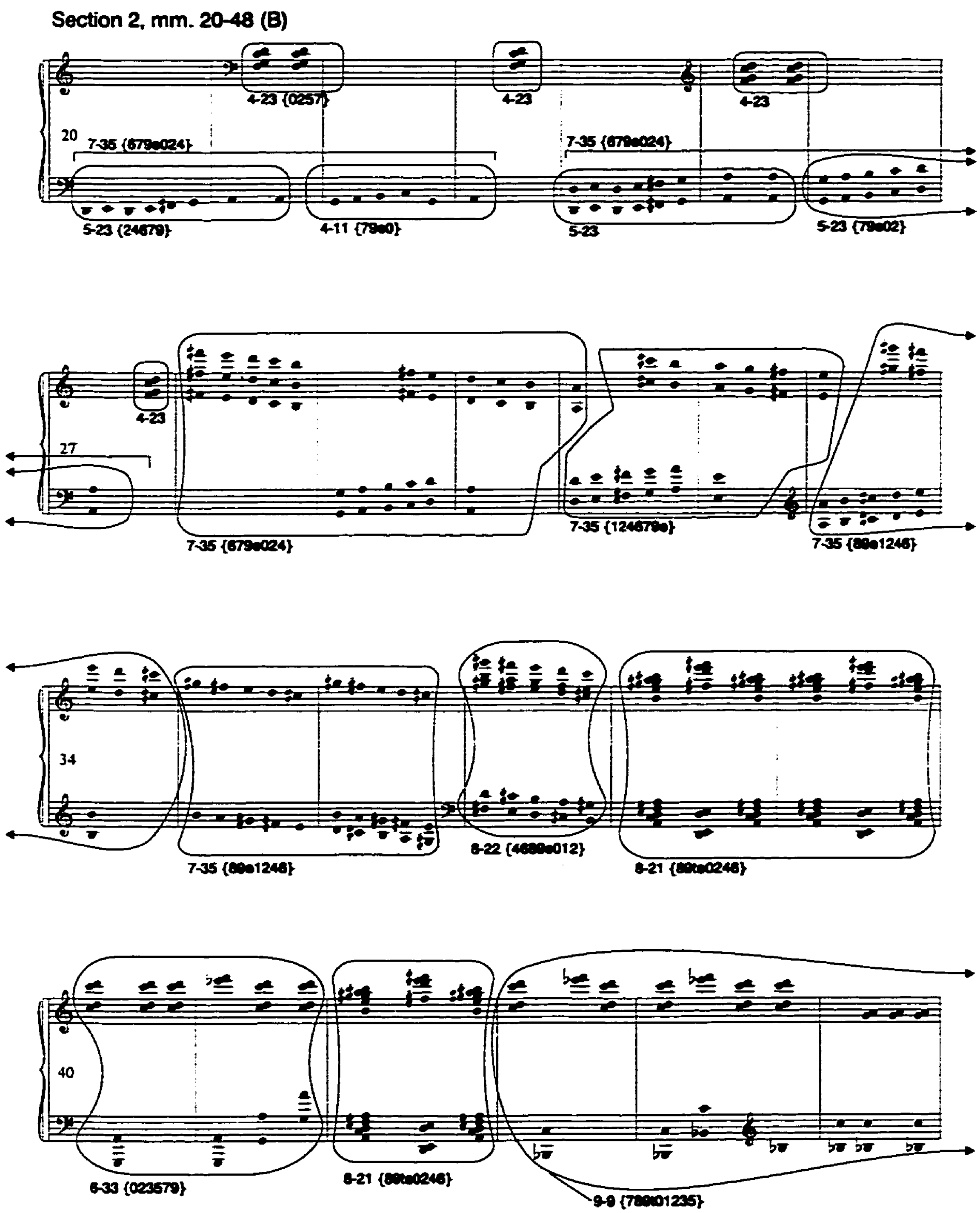
Although the diatonic collection 7-35 is not contained within the first statement of the theme in mm. 1-19, sc 7-35 does receive explicit expression when the theme is reintroduced (see example 4.3). Following the initial presentation of the reprised theme, in mm. 92-99, a varied repetition is presented in mm. 100-110. The last four measures of this thematic restatement (mm. 104-107) express a form of sc 7-35 {124689e}. Set-class 7-35 is expressed when the pitch materials of mm. 104-105, which present a form of sc 5-35 {e1468} (sc 7-35's abstract complement), are combined with the pitch materials of mm. 106-107, which express a form of sc 5-23 {9e124}. As my segmentation of these measures demonstrates, the transitional material of mm. 108-110 extends the domain of sc 7-35 {124689e} to the end of the section.

The second presentation occurs when the theme is restated in mm. 157-175 (see example 4.3). In this instance, both the initial statement of the theme and its repetition present variants of the opening theme. Moreover, the second thematic statement represents a variant of the first. It is during the second thematic statement, in mm. 165-168, that a form of sc 7-35 {134689e} is expressed. The sc is formed as a result of a composite segment involving a form of sc 5-35 {e1468}, presented in the RH in mm. 165-166, and a form of sc 5-24 {9e134}, stated in the RH in mm. 167-168. This time, however, (as my segmentation illustrates) harmonic support is provided by the two forms of trichord 3-11: {914} (m. 166) and {8e3} (m. 168). Also worth mentioning are the additional presentations of sc 7-35, which serve to bring the reprise to a close. The first, in the form {134689e}, is presented in mm. 169-171, while the second, in the form {124689e}, occurs in mm. 171-174.

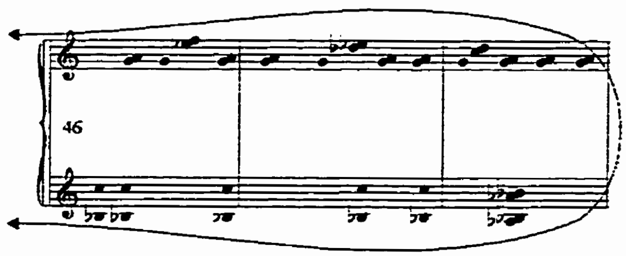
Theme B

Although the phrase structure of theme B and its varied reprises (with the exception of mm. 20-27 and mm. 111-126) lacks the symmetry of theme A, its pitch resources, like those of theme A, evince a high degree of interconnection. A pitch reduction and segmentation of the three presentations of theme B (section 2, mm. 20-48; section 5, mm. 111-138; and section 8, mm. 175-200), as outlined in figure 4.1, appears below as example 4.4. The degree to which the pitch materials of theme B are interconnected is illustrated in figure 4.3, which presents an inclusion matrix for the scs identified. Table 4.2 presents the ratio of actual to possible subset/superset connections: 0.7768.

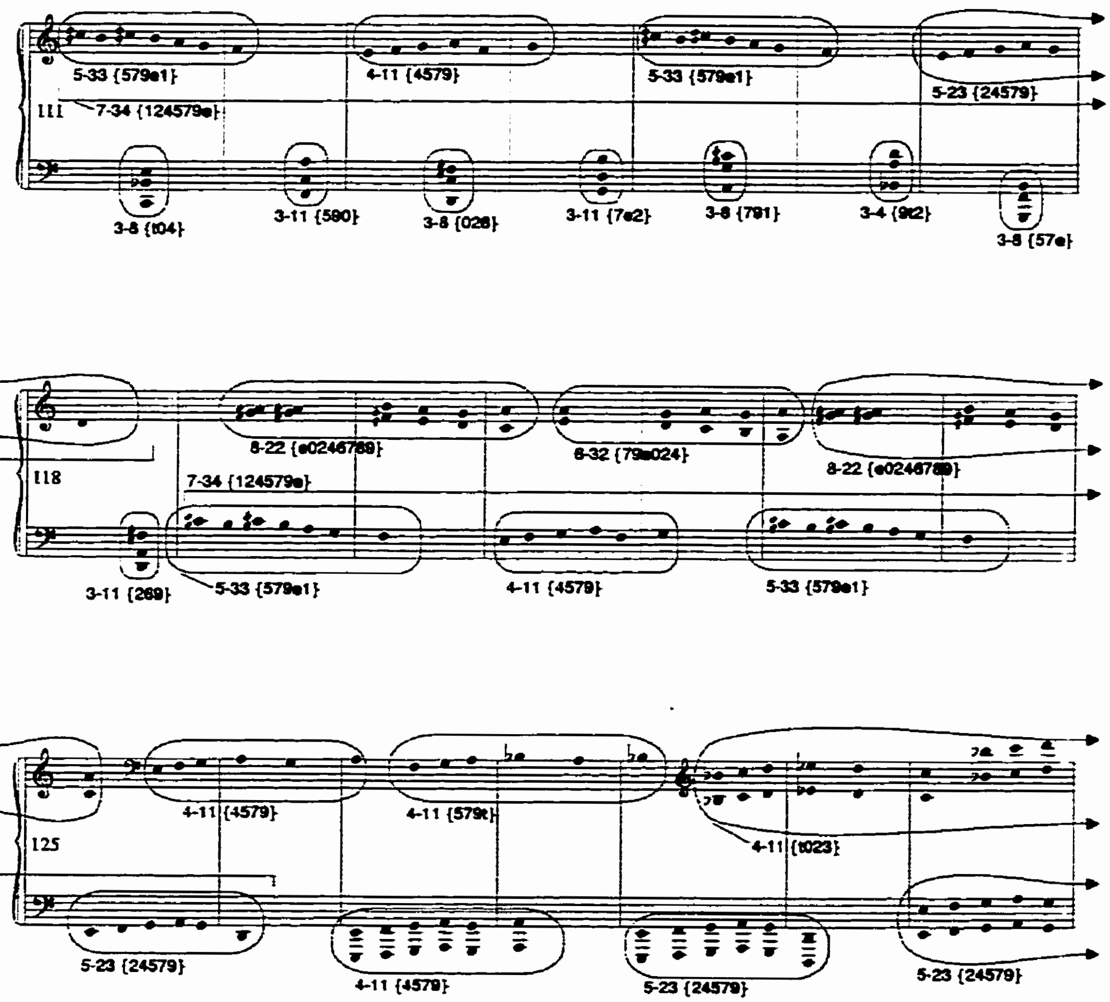
Example 4.4. Pitch reduction and segmentation of theme B



Example4.4 (continued)

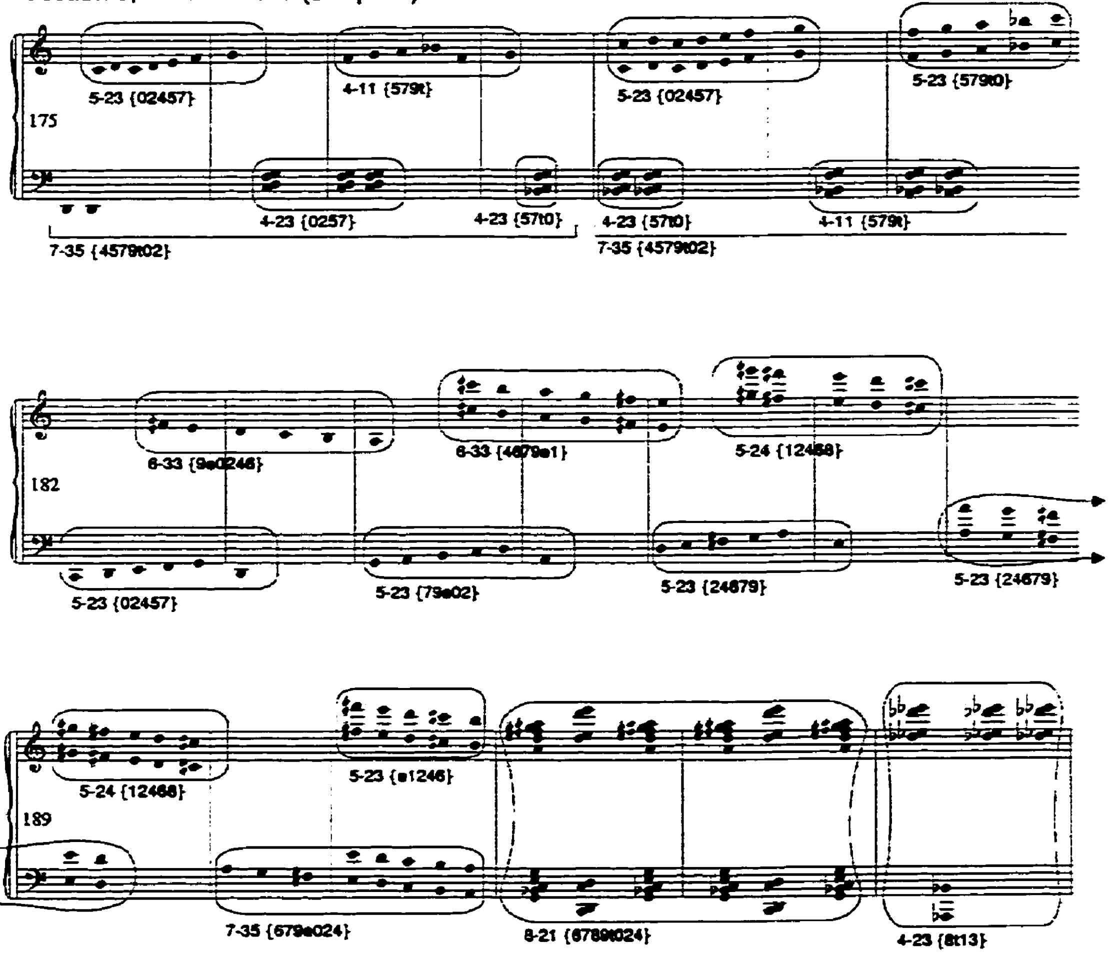


Section 5, mm. 111-138 (B-reprise "inverted")



Example 4.4 (continued)

Section 8, mm. 175-200 (B-reprise)



Example 4.4 (continued)

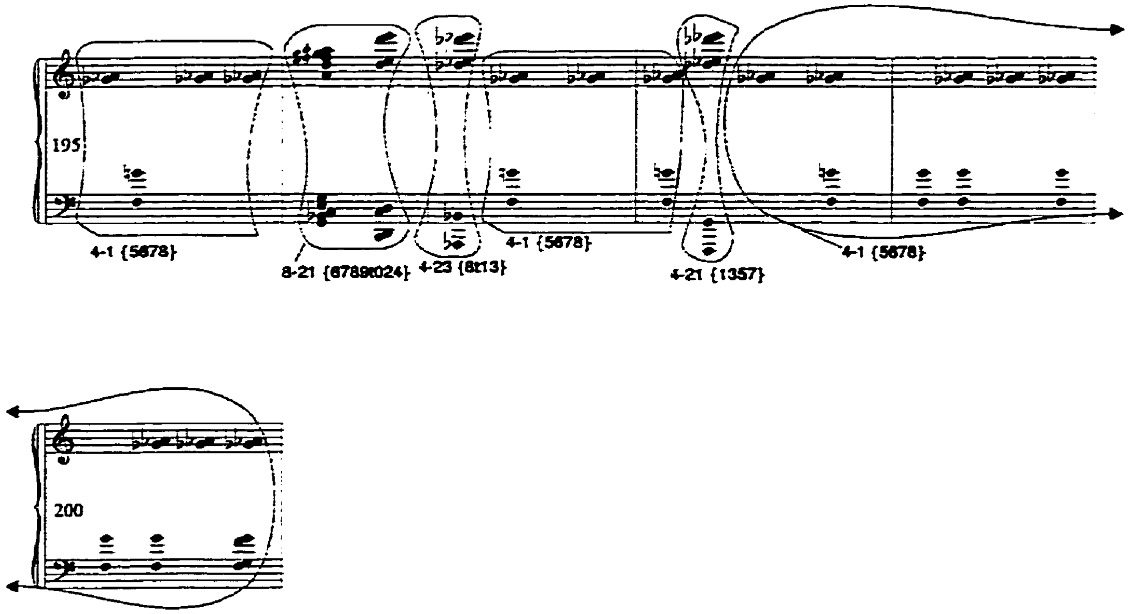


Figure 4.3. Inclusion matrix for the scs of theme B

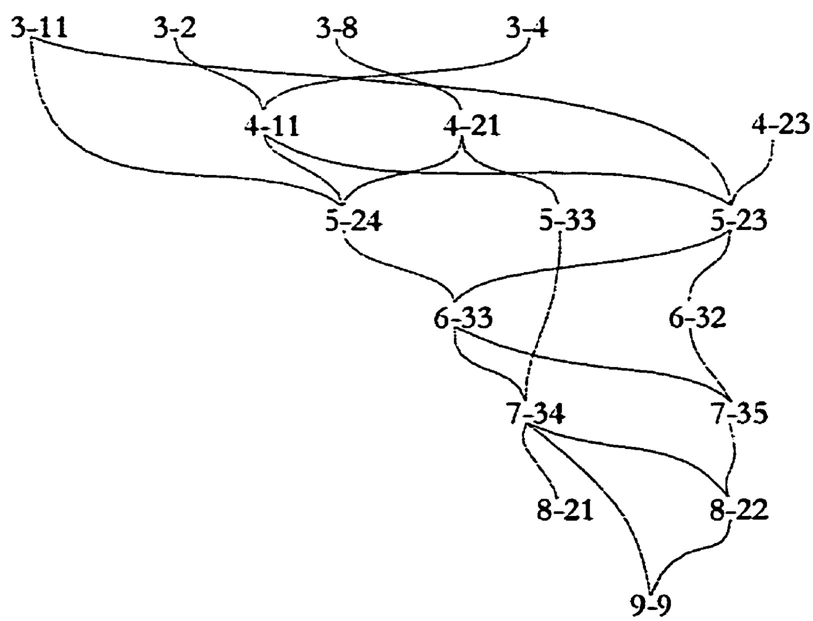


Table 4.2. Ratio of actual to possible subset/superset connections among the scs of theme B

Scs	Actual	Possible
3-2	10	13
3-4	10	13
3-8	9	13
3-11	9	13
4-11	11	14
4-21	9	14
4-23	8	14
5-23	12	14
5-24	12	14
5-33	6	14
6-32	9	15
6-33	14	15
7-34	14	15
7-35	13	15
8-21	12	15
8-22	15	15
9-9	15	16
Total	188	242

Ratio = 0.7768

I should point out that the inclusion matrix and accompanying table have not taken into account the two expressions of a form of sc 4-1 {5678} that occur in the final presentation of theme B (mm. 175-200) at m. 195 and in mm. 197-200 (see example 4.4). The reason is that these presentations of sc 4-1 are identical to, and as a result foreshadow, the LH's accompanying ostinato that permeates the second-to-last variant of theme A that follows in mm. 201-226 (whose pc content will be examined shortly).

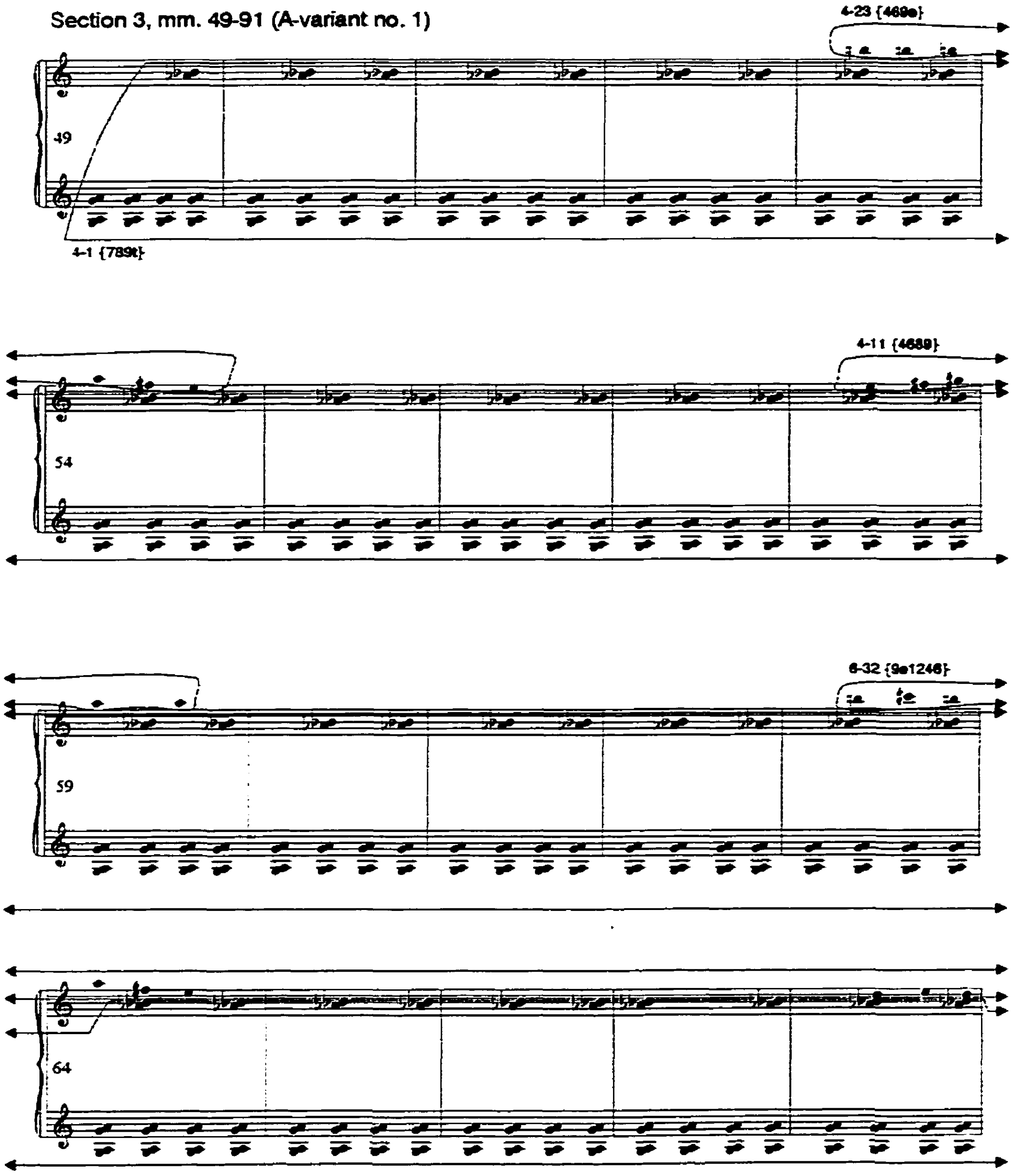
With the exception of the chromatic interjections of sc 4-1 mentioned above, the scs of theme B and its two reprises are diatonic. However, the sc inventory of theme B is not entirely related by inclusion to sc 7-35, as is confirmed in mm. 38-39 and again at m. 42 (see example 4.4). In both instances the combined pitch materials of the RH and LH constitute a form of sc 8-21 {89te0246}, a superset of sc 7-34. Indeed, sc 7-34 plays an important role in the subsequent presentation of theme B. When the theme returns in m. 111-118 (in its quasi-inverted form) the RH's melodic presentation results in a form of sc 7-34 {124579e}. Since the pc content of the theme's restatement, in the LH in mm. 119-126, is identical to that of the RH's presentation in mm. 111-118, an additional statement of sc 7-34 results {124579e}.

Set-class 7-35 makes one final appearance during the opening presentation of the theme in mm. 175-178 and 179-181. In both instances the sc receives expression as {024579t}. The combined significance of scs 7-35 and 7-34 will be examined below under the heading "Pitch-Class Set-Generic Relations." It is interesting to note, however, that theme B's incorporation of scs 7-35 and 7-34 (and their respective subsets and supersets) resembles the first movement's second-theme area.

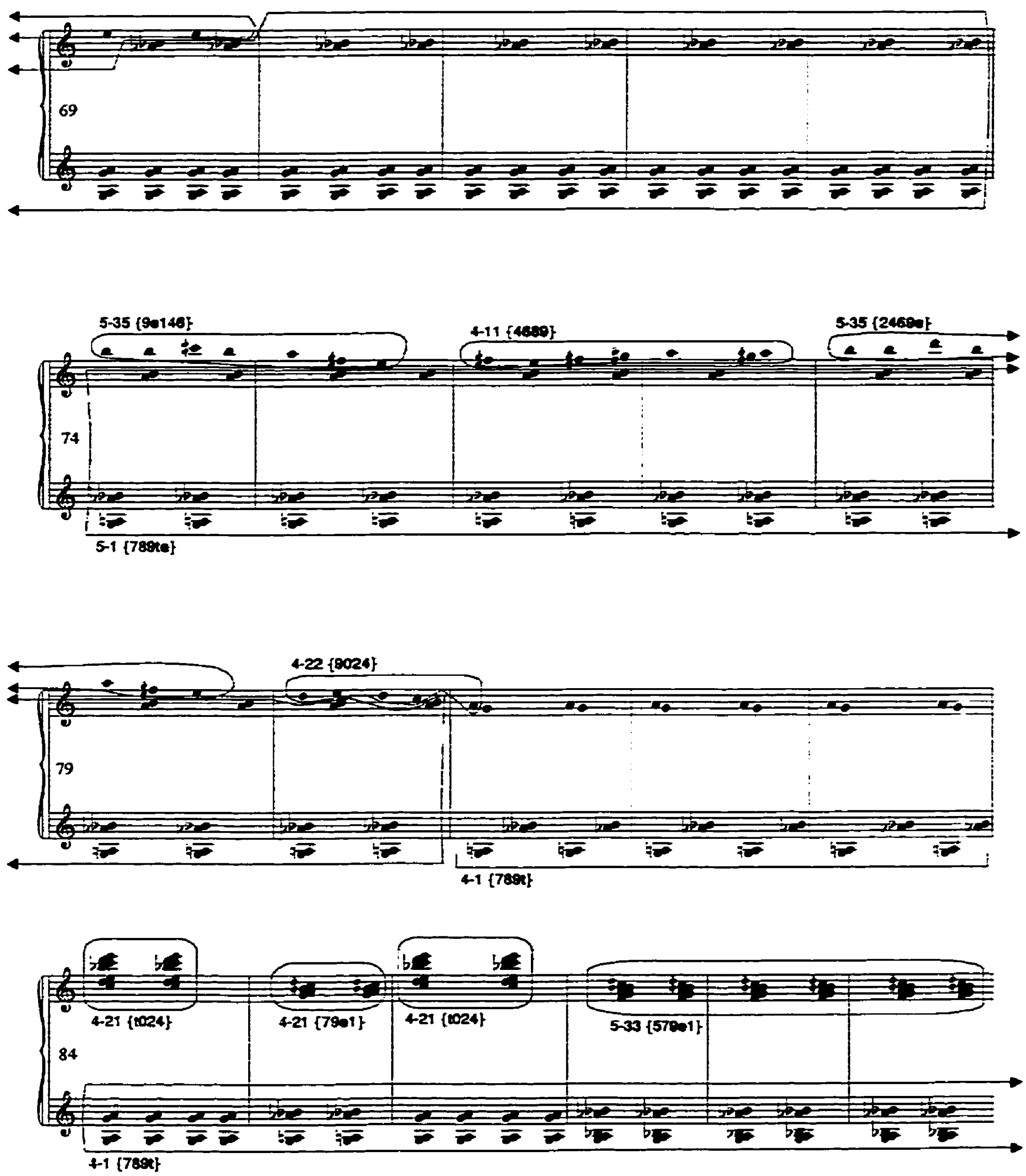
The Four Variants of Theme A

Example 4.5 presents a pitch reduction and segmentation of the four variants of theme A as outlined in figure 4.1. Each variant is presented in the RH. The scs of the four variants, like those of theme A, are all subsets or supersets of sc 7-35. As figure 4.4 and table 4.3 demonstrate, a high degree of inclusion among the diatonic scs of the four variants results, the ratio of actual to possible connections being 0.8723.

Example 4.5. Pitch reduction and segmentation of the four variants of theme A

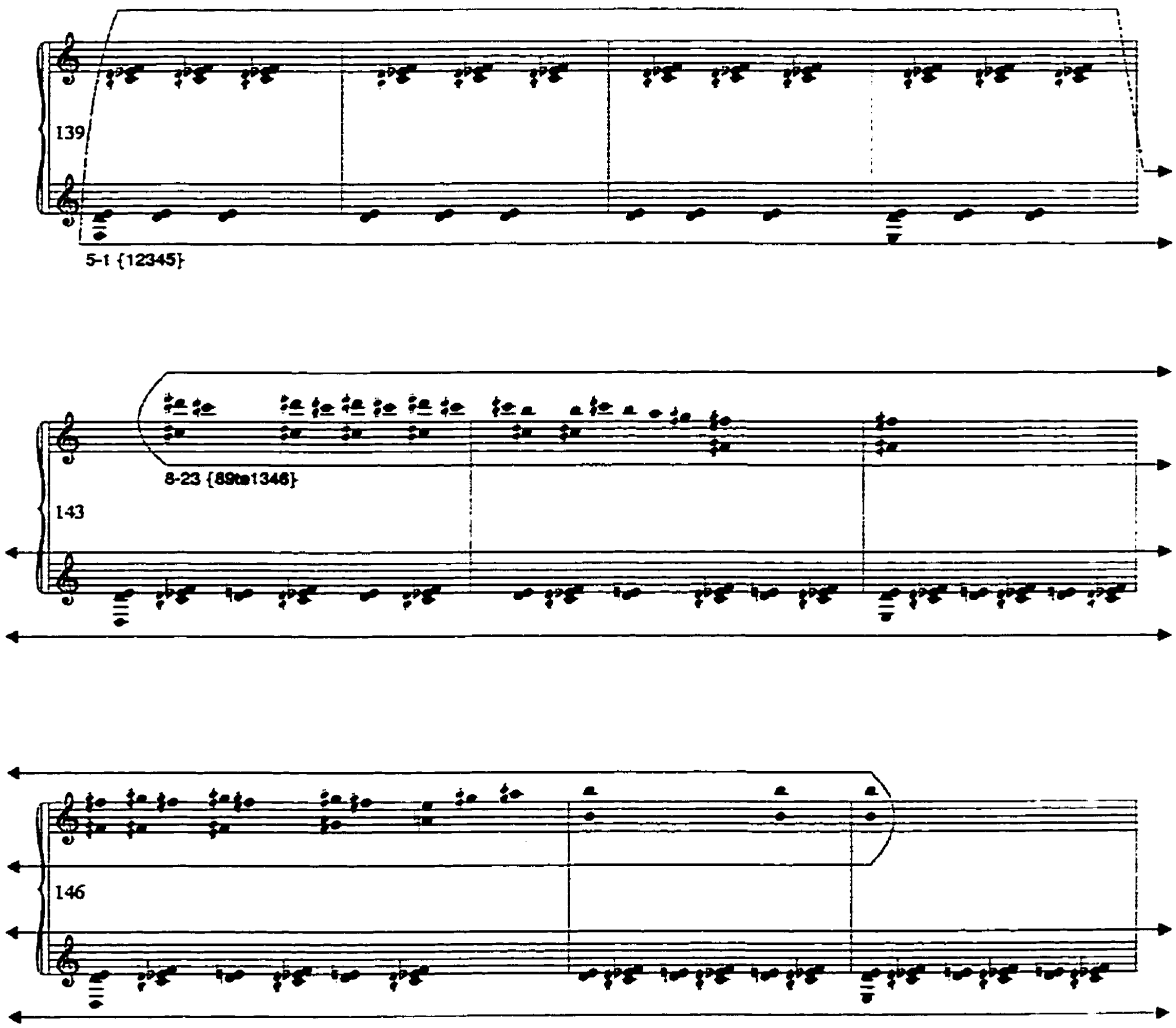


Example 4.5 (continued)

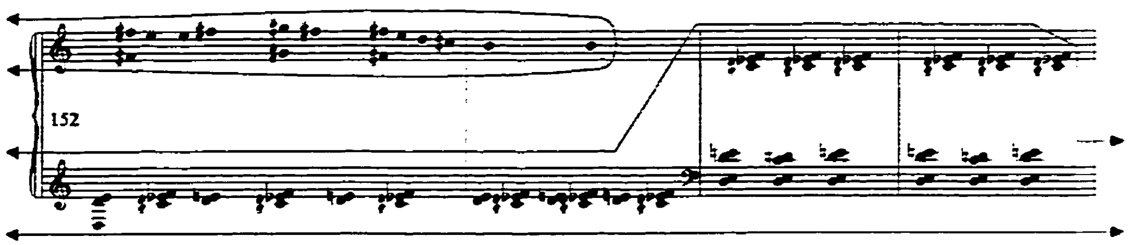


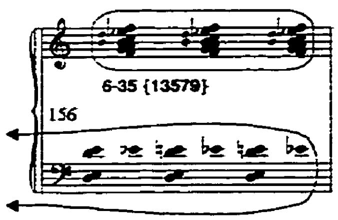
Example 4.5 (continued)

Section 6, mm. 139-156 (A-variant no. 2)



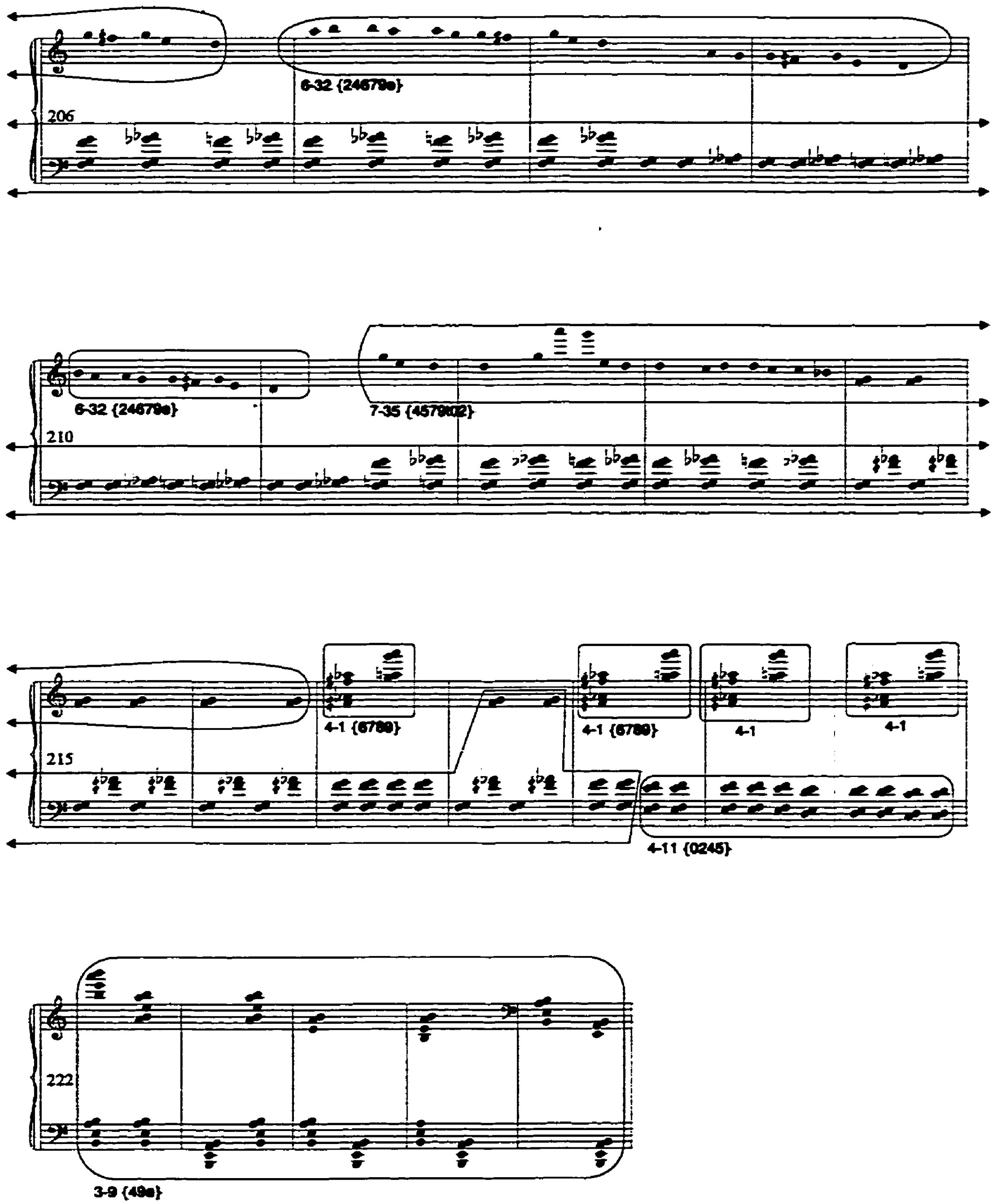
Example 4.5 (continued)





Section 9, mm. 201-226 (A-variant no. 3)

Example 4.5 (continued)



Example 4.5 (continued)

Section 10, mm. 227-247 (A-variant no. 4)

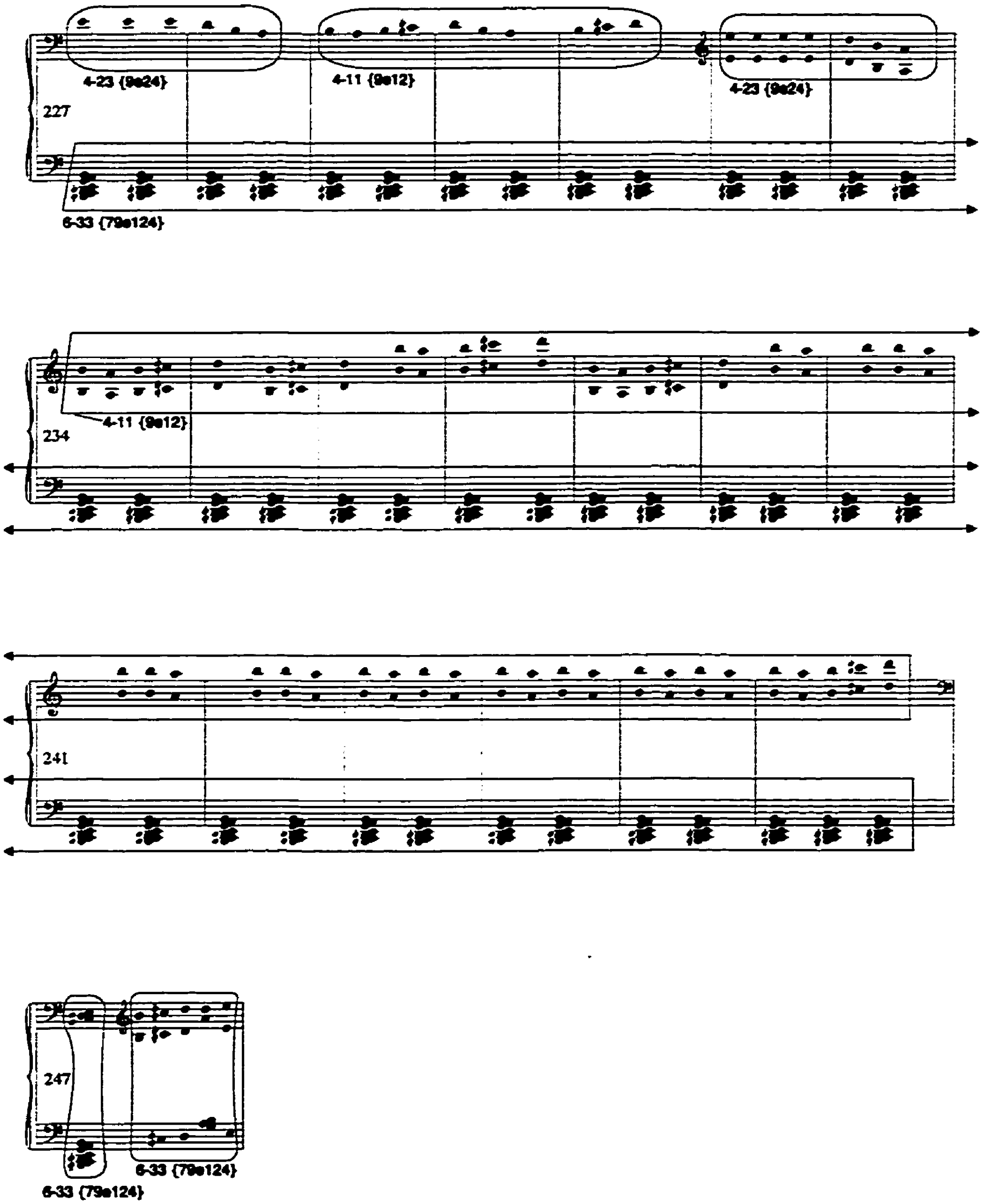


Figure 4.4. Inclusion matrix for the sc inventory of the four variants of theme A

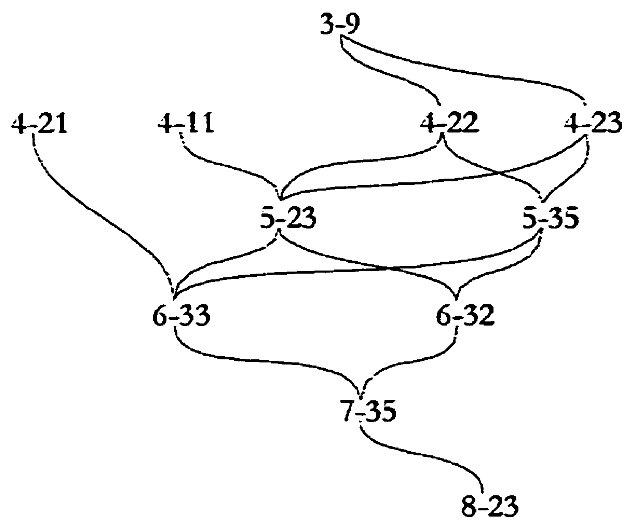


Table 4.3. Ratio of actual to possible subset/superset connections among the scs of the four variants of theme A

Scs	Actual	Possible
3-9	8	10
4-11	5	7
4-21	3	7
4-22	7	7
4-23	7	7
5-23	8	9
5-35	7	9
6-32	8	9
6-33	9	9
7-35	10	10
8-23	10	10
Total	82	94

Ratio = 0.8723

Example 4.5 illustrates that in addition to the diatonic scs of the four variants, chromatic ostinati accompany the first three variants.[8] For example, in mm. 49-73 (variant

[8] The final variant (mm. 227-247) is accompanied by a non-chromatic (diatonic) hexachord, a form of sc 6-33 {79e124}.

no. 1), the LH presents a form of sc 4-1 {789t}. During the same variant, in mm. 74-80, the chromatic ostinato is expanded through the inclusion of pc {e}, resulting in a form of sc 5-1 {789te}. The variant concludes with a return to the initial chromatic tetrachord 4-1 {789t} in mm. 81-91. The second variant (mm. 139-156) presents a different chromatic ostinato. This time the chromatic figure is represented by a single form of sc 5-1 {12345}. The third variant (mm. 201-226) is also accompanied by a chromatic ostinato, a form of sc 4-1 {5678}, in mm. 201-219. This tetrachord receives its initial presentation (as mentioned above) during the concluding measures of theme B's final return where it is presented at m. 195 and again in mm. 197-198. One final chromatic tetrachord, in the form {6789}, appears in m. 217 and mm. 219-221.

Since these non-diatonic (accompanimental) ostinati do not affect the variants directly, the scs they embody have not been included in figure 4.4 and table 4.3. However, their significance as an important source of contrast will be acknowledged in the final section of the chapter under the heading "Pitch-Class Set-Generic Relations."

Two additional scs have been excluded from the inclusion matrix (and accompanying table): forms of scs 5-33 {579e1} and 6-35 {13579e}. These non-diatonic (wholetone) scs, which briefly conclude the first and second variants (represented by 5-33 {579e1} in the RH in mm. 87-89, and 6-35 {13579e} in the RH in mm. 90-91 and m. 156), will also be addressed in the following section.

Pitch-Class Set-Generic Relations

The preceding sections have demonstrated that formal (thematic) divisions within the movement, identified above in figure 4.1, are also supported by pitch-structural relationships within the realm of sc inclusion. As we have seen, the pitch materials of each of the corresponding formal divisions exhibit a strong degree of interconnection. In our final examination of the movement's pitch materials, thematic sections will be considered in terms of their pc set-generic makeup. Once again, our discussion will begin with an examination of theme A (and the coda), followed by theme B and the four variants of theme A.

Theme A and the Coda

A significant degree of interconnection among theme A's scs (and those of the coda) has already been demonstrated through inclusion, where the ratio of actual to possible subset/superset connections among the scs is 0.7660 (see table 4.1). In addition, all of the scs identified share an important property: they are subsets or supersets of the diatonic collection 7-35. Consequently, we can account for the pitch materials of theme A and the coda in terms of the diatonic simple genus 7-35. Table 4.4 presents the member scs of the simple genus 7-35.

Table 4.4. The simple genus 7-35

Simple Genus 7-35 (53 scs)		
Cynosural Sc	Counts	Ordinal Number/Number of Forms
7-35		
2	6	1|2 2|5 3|4 4|3 5|6 6|1
3	9	2|4 [redacted] 5|2 6|3 [redacted] 8|2 [redacted] 10|1 [redacted]
4	13	8|1 10|2 [redacted] 16|2 20|2 21|1 [redacted] 26|3 27|2 29|2
5	9	12|1 20|2 [redacted] 25|2 [redacted] 34|1 [redacted]
6	4	25|2 26|1 [redacted]
7	1	[redacted]
8	3	22|2 23|2 26|1
9	4	6|1 7|4 9|3 11|2
10	4	2|3 3|2 4|1 5|4
Total	53	

Since the simple genus 7-35 introduces a new genus into the discussion, the characteristic scs of the simple genus are presented below as table 4.5.

Table 4.5. The characteristic scs of the simple genus 7-35

Scs	Sias	Icvs
9-9	<1-1-1-2-1-1-1-2-2>	[676683]
8-23	<1-1-1-2-2-1-2-2>	[465472]
7-35	<1-2-2-1-2-2-2>	[254361]
6-32	<2-2-1-2-2-3>	[143250]
5-35	<2-2-3-2-3>	[032140]
4-23	<2-3-2-5>	[021030]
3-9	<2-5-5>	[010020]

As the sias of the characteristic scs demonstrate, all of the scs are symmetrical (as is the cynosural sc itself). The scs are also related by inclusion. In addition, the characteristic scs cluster in complement pairs on either side of the hexachordal sc 6-32. Symmetrical relations are also reflected within the genus as a whole in which a significant number of symmetrical scs result: 29 out of 53. Regarding the characteristic scs's intervallic properties, the icvs of scs 6-32, 7-35, 8-23, and 9-9 each demonstrate an important feature of diatonic scs; namely, they contain a variety of ic types. In addition, the ics represented are predominantly uneven in distribution. These properties are best represented by the cynosural sc itself, whose icv contains a different number of occurrences for each of the six ics (this is also true of sc 6-32, although sc 6-32 does not contain the tritone).[9]

[9] Only two additional scs share this property, the hexachord 6-1 [543210] and the heptachord 7-1 [654321]. For a discussion of unique icv entries and their distributions see Forte, *The Structure of Atonal Music*, 16-18.

Other features of the diatonic genus's characteristic scs include the maximization of ic 5.[10] Interval-class 5 appears in ascending order from 2 through 8, beginning with sc 3-9. Interval-class 2, which appears next-to-most often, is also prominently represented among the scs, receiving expression in ascending order from 1 through 7. The final prominently represented ic is ic 3, which is presented in ascending order from 0 through 6.

While all of these features of the diatonic genus contribute to the wide variety of harmonic possibilities that diatonic scs afford, in the context of the third movement Bartók tends to focus on symmetrical scs that maximize ic 5 (e.g., 3-9, 4-23, 5-35, 6-32, and 7-35). In addition, emphasis is given to those scs strongly represented by ic 2 (4-11 [121110], 5-24 [131221]), ic 5 (4-14 [111120], 5-27 [122230], 5-29 [122131]), and ics 2 and 5 (4-22 [021120], 5-23 [132130], and 6-33 [143241]).

Figure 4.5 provides a summary of theme A's (and the coda's) pc set-generic relations in accordance with figure 4.1's sectional divisions.

[10] This observation was made previously in chapter 3 concerning sc 3-9. The maximization of an ic within a particular scs's icv can be expressed as: *c*-1, where *c* is the cardinal number of the sc. For example, in the case sc 3-9, ic 5 receives 2 counts (3 minus 1). For a discussion of ic maximization within icvs see Forte, *The Structure of Atonal Music*, 16-18.

Figure 4.5. Theme A's and the coda's pc set-generic relations and formal divisions

Theme A	Genus	Scs
mm. 1-19	7-35 (diatonic)	3-7, 3-9, 4-11, 4-23
mm. 92-110	7-35 (diatonic)	3-7, 3-9, 4-11, 4-23 5-23, 5-24, 5-29 5-35, 7-35
mm. 157-175	7-35 (diatonic)	3-11, 4-23, 5-24, 5-35, 6-33, 7-35
mm. 248-264	7-35 (diatonic)	3-4, 3-7, 3-9, 4-11 5-23, 5-24, 5-27, 5-29, 5-35
Coda	Genus	Scs
mm. 265-281	7-35 (diatonic)	3-4, 3-9, 4-13, 4-14, 4-22, 6-32, 7-35

Theme B

A strong degree of interconnection among the scs of theme B (and its varied reprises) has already been demonstrated in figure 4.3 and table 4.2. In addition, it was noted that while many of the scs identified are subsets and supersets of the diatonic collection 7-35, the presence of sc 7-34 (such as when the theme is restated in its quasi-inverted form in mm. 111-126) must also be addressed. Modeling the pitch materials of theme B by way of the complex genus 7-34/7-35 successfully addresses this issue. The complete list of member scs for the complex genus is presented as table 4.6. Although the member scs of this complex genus were presented earlier in chapter 2, table 4.6 highlights the sc inventory of theme B and its two varied reprises.

Table 4.6. The complex genus 7-34/7-35

Complex Genus 7-34/7-35 (76 scs, 42 primary, 34 secondary)		
Cynosural Sc	Counts	Ordinal Number/Number of Forms
7-34		
2	6	1|2 2|5 3|4 4|4 5|4 6|2
3	11	2|4 3|2 4|2 5|2 6|3 7|6 8|6 9|3 10|2 11|4 12|1
4	17	3|1 10|2 11|2 12|2 13|2 14|2 15|2 16|2 19|2 21|2 22|4 23|2 24|2 25|1 26|1 27|4 29|2
5	12	10|2 17|1 23|2 24|2 25|2 26|2 28|2 29|2 30|2 33|1 34|2 35|1
6	4	23|1 24|2 33|2 34|2
7	1	34|1
8	3	21|1 22|2 27|2
9	6	6|2 7|2 8|2 9|1 10|1 11|2
10	5	2|3 3|2 4|2 5|2 6|1
Total	65	
7-35		
2	6	1|2 2|5 3|4 4|3 5|6 6|1
3	9	2|4 4|4 5|2 6|3 7|8 8|2 9|5 10|1 11|6
4	13	8|1 10|2 11|4 13|2 14|4 16|2 20|2 21|1 22|6 23|4 26|3 27|2 29|2
5	9	12|1 20|2 23|4 24|2 25|2 27|4 29|2 34|1 35|3
6	4	25|2 26|1 32|2 33|2
7	1	35|1
8	3	22|2 23|2 26|1
9	4	6|1 7|4 9|3 11|2
10	4	2|3 3|2 4|1 5|4
Total	53	
UNION		
2	6	1|4 2|10 3|8 4|7 5|10 6|3
3	11	2|8 3|2 4|6 5|4 6|6 7|14 8|8 9|8 10|3 11|10 12|1
4	19	3|1 8|1 10|4 11|6 12|2 13|4 14|6 15|2 16|4 19|2 20|2 21|3 22|10 23|6 24|2 25|1 26|4 27|6 29|4
5	15	10|2 12|1 17|1 20|2 23|6 24|4 25|4 26|2 27|4 28|2 29|4 30|2 33|1 34|3 35|4
6	7	23|1 24|2 25|2 26|1 32|2 33|4 34|2
7	2	34|1 35|1
8	5	21|1 22|4 23|2 26|1 27|2
9	6	6|3 7|6 8|2 9|4 10|1 11|4
10	5	2|6 3|4 4|3 5|6 6|1
Total	76	
Primary Scs		
2	6	1|4 2|10 3|8 4|7 5|10 6|3
3	9	[redacted] 5|4 6|6 7|14 [redacted] 9|8 10|3 [redacted]
4	11	10|4 [redacted] 13|4 14|6 16|4 [redacted] 22|10 [redacted] 26|4 27|6 29|4
5	6	[redacted] 25|4 29|4 34|3 35|4
6	1	[redacted]
7	0	
8	1	[redacted]
9	4	6|3 7|6 [redacted] 11|4
10	4	2|6 3|4 4|3 5|6
Total	42	

Table 4.6 (continued)

<table>
<tr><td colspan="3">Secondary Scs</td></tr>
<tr><td>2</td><td>0</td><td></td></tr>
<tr><td>3</td><td>2</td><td>3|2 12|1</td></tr>
<tr><td>4</td><td>8</td><td>3|1 8|1 12|2 15|2 19|2 20|2 24|2 25|1</td></tr>
<tr><td>5</td><td>9</td><td>10|2 12|1 17|1 20|2 26|2 27|4 28|2 30|2 [redacted]</td></tr>
<tr><td>6</td><td>6</td><td>23|1 24|2 25|2 26|1 [redacted] 34|2</td></tr>
<tr><td>7</td><td>2</td><td>[redacted]</td></tr>
<tr><td>8</td><td>4</td><td>[redacted] 23|2 26|1 27|2</td></tr>
<tr><td>9</td><td>2</td><td>8|2 10|1</td></tr>
<tr><td>10</td><td>1</td><td>6|1</td></tr>
<tr><td>Total</td><td>34</td><td></td></tr>
</table>

The effectiveness of modeling the pitch materials of theme B by the complex genus 7-34/7-35 is supported by the observation that 12 out of the 15 scs identified (excluding the cynosural scs themselves) represent primary members of the complex genus; that is to say, twelve of theme B's scs (3-2, 3-4, 3-8, 3-11, 4-11, 4-21, 4-23, 5-23, 5-24, 6-33, 8-22, and 9-9) constitute member scs of the intersection of simple genera about 7-34 and 7-35 (see table 4.6).

Table 4.7 presents a list of the complex genus's characteristic scs. Although the scs are the same as those presented in chapter 2, I have identified symmetrical scs with an asterisk in order to highlight an important relationship between the characteristic scs of the simple genus 7-35 and those of the complex genus 7-34/7-35. As we noted above, all of the characteristic scs of the simple genus 7-35 are symmetrical. Symmetrical scs are also represented among the complex genus's characteristic scs. Note, for example, the alternation (by adjacent cardinality) between symmetrical scs (3-6, 5-34, 7-34, 7-35, and 9-6) and asymmetrical scs (4-22, 6-33, and 8-22). In addition, as in the simple genus 7-35, symmetry plays an important role within the complex genus since 39 (out of 76) scs are symmetrical.[11]

Table 4.7. The characteristic scs for the complex genus 7-34/7-35

Scs	Sias	Icvs
*9-6	<1-1-1-1-1-1-2-2-2>	[686763]
8-22	<1-1-1-2-1-2-2-2>	[465562]
*7-35	<1-2-2-1-2-2-2>	[254361]
*7-34	<1-2-1-2-2-2-2>	[254442]
6-33	<2-1-2-2-2-3>	[143241]
*5-34	<2-2-2-3-3>	[032221]
4-22	<2-2-3-5>	[021120]
*3-6	<2-2-8>	[020100]

Relationships between the simple genus 7-35 and the complex genus 7-34/7-35 are not limited to symmetrical properties. For example, similarities in ic content also result. While the maximization of ic 5, followed by a predominance of ics 3 and 2, was evident among the icvs of the characteristic scs of simple genus 7-35, a similar hierarchy of ics results among the characteristic scs of the complex genus 7-34/7-35. This time, however, the ranking of ics changes. Among the complex genus's characteristic scs, ic 2 (rather than ic 5) is the most strongly represented, while ic 5 is the second-most-strongly represented ic receiving a total of 30 counts (ic 2 receives a total of 35 counts).

The slightly higher concentration of major seconds (ic 2) is reflected in the musical surface when theme B is reintroduced (mm. 111-112) in its quasi-inverted form (see example

[11] In comparison, the "asymmetrical" complex genus 6-Z25/5-11 contains only 44 (out of 112) symmetrical scs. The majority of the genus's scs (68 out of 112) are asymmetrical. This relationship was also reflected in the complex genus's characteristic scs in which all 7 were shown to be asymmetrical.

4.4). Its opening statement <C♯-B-C♯-B-A-G-F> clearly emphases ic2. These ordered pcs are presented three more times: in mm. 15-16, 119-120 (LH), and 122-123 (LH). In addition, as accompanimental support in the RH, in mm. 119-121 and 123-125, the bottom voice presents a series of descending wholetones <G♯-F♯-E-D-C> against the LH's final two presentations of the theme's opening statement.

Figure 4.6 presents a summary of theme B's pc set-generic relations in accordance with figure 4.1's sectional divisions. The two presentations of the chromatic sc 4-1 (presented in m. 195 and mm. 197-200), have been labeled "chromatic" under the heading "Genus." These presentations of sc 4-1 were not factored into the sc inventory of theme B given that their pitch content is identical to (and thus foreshadows) the LH's accompanying ostinato figure of the following sectional division (to be examined below).

Figure 4.6. Theme B's pc set-generic relations and formal divisions

Theme B	Genus	Scs
mm. 20-48	7-34/7-35	4-11, 4-23, 5-23, 6-33, 7-35, 8-21, 8-22, 9-9
mm. 111-138	7-34/7-35	3-2, 3-4, 3-8, 3-11 4-11, 5-23, 5-33 6-32, 7-34, 7-35 8-22
mm. 175-200	7-34/7-35	4-11, 4-21, 4-23 5-23, 5-24, 6-33 7-35, 8-21
	(chromatic)	4-1

The Four Variants of Theme A

Our discussion of pc set-generic relations will conclude with the four variants of theme A. As noted above, the sc inventory of the four variants (with the exception of the chromatic ostinati presented as accompaniment to variants 1, 2, and 3, and the presentation of the two wholetone scs, 5-33 {579e1} and 6-35 {13579e}), consists of subsets or supersets of sc 7-35. Indeed, we might have expected this since theme A's pitch materials are diatonic. Figure 4.4 and table 4.3 illustrated the high degree of inclusion among the diatonic scs of the four variants.

Figure 4.7 lists the pc set-generic relations of the four variants following the formal divisions of figure 4.1. As the figure indicates, the four variants have been accounted for by way of the simple genus 7-35, which establishes a pc set-generic connection to theme A (table 4.8 presents the member scs of genus 7-35, highlighting the scs identified within the four variants).[12] The sections' non-diatonic pitch materials (the chromatic accompaniments of variants 1 through 3, and the brief presentations of forms of scs 5-33 and 6-35 mentioned above) have been identified in figure 4.7 as "chromatic" and "wholetone" respectively. Both the chromatic ostinati (as accompanimental gestures), and the brief presentations of the two wholetone scs 5-33 and 6-35, add to the character of the first three variants. I have not, however, introduced a formal discussion of chromatic and wholetone genera because the scs represented (forms of sc 4-1, {5678}, {6789}, and {789t}; 5-1 {789te}; and, 5-33 {579e1}, and 6-35 {13579e}) so obviously invoke chromatic and wholetone characteristics respectively. The importance of these scs, however, is reflected in the distinct contrast they provide in relation to the diatonic genus that so strongly characterizes the four variants.

---

[12] The genus's characteristic scs are presented in table 4.5.

Figure 4.7. The four variants' pc set-generic relations and formal divisions

Variant no. 1	Genus	Scs
mm. 49-91	7-35 (diatonic)	4-11, 4-21, 4-22 4-23, 5-35, 6-32
	"chromatic" "wholetone"	4-1, 5-1 5-33, 6-35
Variant no. 2	Genus	Scs
mm. 139-156	7-35 (diatonic)	8-23
	"chromatic" "wholetone"	5-1 6-35
Variant no. 3	Genus	Scs
mm. 201-226	7-35 (diatonic)	3-9, 4-11, 5-23 6-32, 7-35
	"chromatic"	4-1
Variant no. 4	Genus	Scs
mm. 227-247	7-35 (diatonic)	4-11, 4-23, 6-33

Table 4.8. The simple genus 7-35

<table>
<tr><td colspan="3">Simple Genus 7-35 (53 scs)</td></tr>
<tr><td>Cynosural Sc</td><td>Counts</td><td>Ordinal Number/Number of Forms</td></tr>
<tr><td>7-35</td><td></td><td></td></tr>
<tr><td>2</td><td>6</td><td>1|2 2|5 3|4 4|3 5|6 6|1</td></tr>
<tr><td>3</td><td>9</td><td>2|4 4|4 5|2 6|3 7|8 8|2 [redacted] 10|1 11|6</td></tr>
<tr><td>4</td><td>13</td><td>8|1 10|2 [redacted] 13|2 14|4 16|2 20|2 [redacted] 26|3 27|2 29|2</td></tr>
<tr><td>5</td><td>9</td><td>12|1 20|2 [redacted] 24|2 25|2 27|4 29|2 34|1 [redacted]</td></tr>
<tr><td>6</td><td>4</td><td>25|2 26|1 [redacted]</td></tr>
<tr><td>7</td><td>1</td><td>[redacted]</td></tr>
<tr><td>8</td><td>3</td><td>22|2 [redacted] 26|1</td></tr>
<tr><td>9</td><td>4</td><td>6|1 7|4 9|3 11|2</td></tr>
<tr><td>10</td><td>4</td><td>2|3 3|2 4|1 5|4</td></tr>
<tr><td>Total</td><td>53</td><td></td></tr>
</table>

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This chapter has demonstrated that the third movement, like the first and second, is also a highly structured movement whose formal boundaries, established by thematic and textural means, are likewise supported by pitch structural relationships within the domains of sc inclusion and pc set-generic relations. In addition, as we have seen, relationships of similarity and contrast pervade the movement. For example, the contrasting themes (themes A and B) also evince a high degree of similarity since the complex genus 7-34/7-35, which accounts for the pitch materials of theme B and its two varied reprises, bears a significant resemblance to the simple genus 7-35, which accounts for the pitch materials of theme A and its three varied reprises; both genera exhibit important diatonic characteristics.[13]

On the other hand, the integration of distinct pitch resources within and among sectional divisions provides for an exciting contrast. For example, although the pitch materials of theme A (and the three varied reprises) are diatonic, through their strong association with sc 7-35, the first three variants of theme A feature chromatic and wholetone elements against the diatonic background.

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[13] Interrelationships between scs 7-34 and 7-35 were also mentioned in chapter 2 in connection with the second-theme area of the first movement.

CHAPTER 5

CONCLUSIONS

This thesis has shown that pc set theory in combination with pc set genera theory provides an appropriate and effective means by which to examine important aspects of the Sonata's pitch materials. Through the examination of large-scale structural relationships within each of the three movements, the thesis has demonstrated that the Sonata exhibits a high degree of pitch-structural integration. This is confirmed by the observation that within each movement, formal divisions, identified primarily through an examination of thematic-motivic associations, are also supported by pitch-structural relationships; that is, interconnections between form, motivic-thematic materials, pc sets, and pc set genera work together in forging large-scale structures for each of the three movements.

In our consideration of the first movement we noted that although the first and second themes display a degree of similarity from a motivic point of view, the first-theme area is distinguished from the second-theme area by its particular saturation with the three-note motive. Strong relationships of sc inclusion among the sc inventories of each theme were also noted. Complementing this, we observed that the first- and second-theme areas are further distinguished on the basis of their pc set-generic associations, the first theme demonstrating octatonic characteristics through its association with the octatonic genus 8-28, and the second theme demonstrating diatonic characteristics through its association with the complex genus 7-34/7-35.

Similar observations were noted in the second movement. However, here the analytical strategy was slightly altered. In order to appreciate the degree of inclusion among the scs of the two large-scale formal divisions A and A', it was necessary to divide the sc inventory of these sections into two distinct groups, diatonic and non-diatonic scs. From a pc set-generic perspective, this resulted in a new complex genus. The complex genus 7-35/9-1 effectively served as our pc set-generic model.

In a similar manner to sections A and A', section B also contained a mixture of diatonic and non-diatonic scs. Once again it was necessary to divide the sc inventory into two distinct groups, diatonic and non-diatonic scs. We noted that both the diatonic and non-diatonic scs exhibited a very high degree of interconnection in terms of inclusion (higher than the sc inventory of sections A and A'). Section B's complex genus brought into the discussion two new scs 5-11 and 6-Z25. The asymmetrical sc 5-11 supplied us with an appropriate non-diatonic cynosural sc (whose appearance in the score, along with its abstract complement, was noted in chapter 3), while the asymmetrical cynosural sc 6-Z25 (also present in the score) provided us with an appropriate diatonic counterpart.

In addition to the distinct pc set-generic associations of sections A and B we identified an important set-theoretical relationship connecting these two contrasting formal sections. This involved the abstract complement relation between the opening trichord of section A, a form of sc 3-7 {358}, and a form of sc 9-7 {01234578t} presented by the LH in mm. 30-41 (section B). And finally, we noted section B's emphasis on the pcs of section A's opening motive <42> (in the LH in mm. 30-41).

In the final movement we saw a return to diatonic materials in connection with sections 1, 4, 7, 11, and 12 (theme A and the coda). This time, however, it was not necessary to introduce the complex genus 7-34/7-35; rather, the diatonic simple genus 7-35 proved sufficient. Theme B (sections 2, 5, and 8), on the other hand, while still expressing diatonic characteristics, demonstrated a strong connection to the complex genus 7-34/7-35. And finally, the four variants of theme A (sections 3, 6, 9, and 10), while incorporating contrasting chromatic and wholetone elements, were found to be strongly associated (like theme A itself) with the diatonic simple genus 7-35. Once again we observed that formal divisions were also complemented by set-theoretical relationships of sc inclusion.

Finally, similarities between the movements were noted. For example, we observed the presence of the first movement's three-note motive in our examination of the second movement. An additional feature common to both of the outer movements is the harmonic contrast provided by the diatonic complex genus 7-34/7-35. Here I would argue that the harmonic contrast provided in each movement is not the same; that is, the contrast provided in the first movement by the octatonic genus (first theme) versus the diatonic complex genus 7-34/7-35 (second theme) is greater than that of the third movement involving the simple genus 7-35 (theme A) versus the complex genus 7-34/7-35 (theme B). This diverges from Wilson's view that the third movement "...is a variant of rondo form in which changes in *harmonic setting*, rather than a true change of theme mark out the separate sections (emphasis mine)."[14] As we have seen, differences between the two themes in both pitch content and phrase structure provide for a significant amount of contrast, whereas the harmonic pitch

[14] Wilson, *The Music of Béla Bartók*, 78.

materials of the two themes (although distinct) bear a significant amount of similarity in terms of their diatonic pc set-generic associations.

While all three movements demonstrate a common pc set-generic characteristic in their incorporation of diatonic pitch materials, the second movement's incorporation of scs that fall outside the spectrum of diatonic collections (a feature of the entire movement rather than a particular section, as in the third movement's four variants of theme A) effectively sets the movement apart from a pc set-generic perspective.

And finally, the analyses have attempted to reflect my opinion that segmentation and formal analysis should have some bearing on how the piece sounds. For this reason, my segmentation strategy emphasized primary segments defined by musical gestures and motivic connections, which in turn helped delineate my formal subdivisions. Of course, the analyses represent my own experience with the piece. The interrelationship between analysis and musical experience (albeit my own) is also reflected, I believe, from a pc set-generic perspective. For example, I observed that the pitch materials of the third movement's themes A and B are quite similar from a diatonic point of view, in contrast with the first- and second-theme areas of the first movement, whose pitch materials evince octatonic and diatonic characteristics respectively. These differences, I suggest, are perceptible. All of the scs identified in the first-theme area are subsets of the octatonic scale and we can therefore hear these passages' pitch materials as evincing octatonicism in the same way that we can hear passages with strong associations to the complex genus 7-34/7-35 (or the simple genus 7-35) as evincing diatonicism. Distinctions between diatonic genera and the octatonic genus are perceptible as a result of their respective scs's ic contents. For example, while ic 3 predominates among the member scs of the octatonic genus 8-28, diatonic genera exhibit a much broader representation of ics among their scs. This results in a tangible aural distinctiveness between the two types of pc set genera. In addition, the characteristic scs of the simple genus 7-35 (9-9, 8-23, 7-35, 6-32, 5-35, 4-23, and 3-9) exhibit a unique quality since they each share the intervallic property whereby ic 5 is maximally represented among their respective icvs. As a result, in contrast to the first movement, the third movement's harmonic materials (with the exception of the chromatic and wholetone embellishments accompanying variants 1, 2, and 3) sound more homogeneous (less differentiated) than those of the first movement.

As we have seen, pc set theory in combination with pc set genera theory provides the analyst with appropriate tools by which to explore the pitch resources of the Sonata for Piano. It is reasonable, therefore, to speculate that further examination may provide additional insights into Bartók's harmonic language. For example, are certain pc set genera unique to Bartók's piano music specifically, or perhaps to his music in general? Are particular genera influential in the composer's earlier works as opposed to his more mature works? Are there pc set-generic characteristics unique to particular genres (e.g., works for solo instruments in contrast to works for orchestra, string quartets, etc.)? Do Bartók's compositions for the stage invoke similar genera to those identified in this study? How does text influence the pc set-generic makeup of these works and others? While all of these important issues lie beyond the scope of this thesis, perhaps others will take up the analytical challenge. In conclusion, I submit that future endeavors of a similar nature may prove to be extremely beneficial in our attempts to broaden our understanding of Bartók's harmonic language.

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