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THE INTEGRATION OF HARMONIC IDIOM AND TONAL DESIGN IN SCHOENBERG'S STRING QUARTET, OP. 7

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Arnold Schoenberg completed his First String Quartet, Op. 7—also known as the D-minor Quartet—in 1905. In an article entitled "Tonality and Form" that he wrote twenty years later, he hinted that there exists in his First Quartet a relationship between keys, and between keys and the incidental harmony, that exemplifies the rigour with which he approached the task of writing tonal music.¹

The purpose of this paper is to describe and illustrate three principles of chromatic harmony used at the foreground level of Schoenberg's First Quartet and to show their integration with the tonal design at various middleground levels.² The three principles to be discussed are: (1) chromatic harmony that employs a cycle of chords derived from the leading-tone diminished-seventh chord; (2) chromatic "projections" and "double-neighbour" chords; and (3) chromaticism resulting from "mixture" of simultaneously functioning diatonic collections. Under each heading, tonal design will be considered from one or more of the following points of view: the key scheme within separate movements of the quartet, the key scheme of the collected movements, and the key scheme of the overall, one-movement sonata form that is superimposed on the four movements.³

CHROMATIC HARMONY THAT EMPLOYS A CYCLE OF CHORDS DERIVED FROM THE LEADING-TONE DIMINISHED-SEVENTH CHORD

By a cycle of chords derived from the leading-tone diminished-seventh chord, I mean a set of four chords, a minor third apart, created when each note of a second diminished-seventh chord is added, in turn, to the leading-tone diminished-seventh chord. The set of minor-third-related chords created by adding the pitch a major third *below* the bottom note of each rotation

¹Arnold Schoenberg, "Tonality and Form" in *Style and Idea: Selected Writings of Arnold Schoenberg*, ed. Leonard Stein, trans. Leo Black (London: Faber and Faber, 1975; first paperback edition with revisions, Berkeley and Los Angeles: University of California Press, 1984), 256-57 (page reference is to paperback edition).

²For another approach to this question, see Maria Niederberger, "Schoenberg's 'Intricate Structure': An Analytic Approach to his String Quartet in D Minor, Op. 7" (Ph.D. diss., Brandeis University, 1991; hereafter, "Schoenberg's 'Intricate Structure'").

³The thematic plan of the quartet, with its simultaneous delineation of a four-movement sonata cycle and a one-movement form, was described by Schoenberg himself. See Ursula von Rauchhaupt, ed., *Schoenberg, Berg, Webern: the String Quartets, a Documentary Study*, trans. Eugene Hartzell (Hamburg: Deutsche Grammophon Gesellschaft, 1971), 11-13, 35-42.

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of the basic diminished-seventh chord has been described by Schoenberg and demonstrated elsewhere in the literature.⁴ A more novel concept, dependent upon the theory of major-minor dualism, is addition of the pitch a major third *above* the top note of each rotation of a diminished-seventh chord. Both techniques are germane to the foreground harmonic idiom of the quartet and both have implications for its deeper-level tonal scheme.

(1) *A cycle of minor-third-related chords created by adding the pitch a major third below the bottom note of each rotation of a leading-tone diminished-seventh chord*

In his 1911 harmony text, Schoenberg describes how "one diminished seventh chord may be interpreted as four different ninth chords."⁵ Example 1a is derived from one of his textbook illustrations.⁶ One diminished-seventh chord (notated in white notes in four enharmonic guises), being symmetrical, may be given four equidistant roots (members of the diminished-seventh chord a semitone below the basic diminished-seventh chord—notated here as black notes) to create four minor-ninth chords that are, by implication, dominants of four keys. A frequently used derivative of this paradigm is shown in Ex. 1b: in many contexts where $\hat{5}$ is literally present, $\hat{6}$ is omitted so as to avoid the extreme dissonance of a minor ninth; this, however, does not contradict the origin of such a cycle in the basic diminished-seventh chord.

Example 1: Minor-third cycle of dominant-function chords derived from one diminished-seventh chord.

a

V^{b9}/C V^{b9}/A $V^{b9}/F\#$ V^{b9}/E_b

b

V^7/C V^7/A $V^7/F\#$ V^7/E_b

⁴For a description of the technique of adding dominant-function roots to a single diminished-seventh chord, see, for example: Schoenberg, *Theory of Harmony*, trans. Roy E. Carter (Berkeley and Los Angeles: University of California Press, 1978; California Library Reprint Series, 1983), 366-67 and 380-81 (page references are to reprint edition); Grace A. L. McNab, "Tonal Voice-leading in Schoenberg's Opus 15" (Master's thesis, University of British Columbia, 1982), 45-59 (hereafter, "Tonal Voice-leading"); and Jean-Michel Boulay, "Monotonicity and Chromatic Dualism in Richard Strauss's *Salome*" (Ph.D. diss., University of British Columbia, 1992), 96-102 (hereafter, "Richard Strauss's *Salome*").

⁵Schoenberg, *Theory of Harmony*, 366.

⁶Schoenberg, *Theory of Harmony*, 367, Ex. 304b.

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Example 2: Minor-third cycle of dominant-function chords and their respective tonics in mm. A1-11 of the first-movement fugato.

mm. A 1 (97) 2 3 4

Countersubject Subject

V of C V^{b9}/C

5 6 7

V^7 of A V^{b9}/A V of F#

8 9 10 11

$V^{b9}/F\#$ $V^6/5$ of E_b V^{b9}/E_b (inverted)

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Example 2 illustrates use of the compositional paradigm shown in Ex. 1 in a passage from the First Quartet.⁷ The excerpt is the first exposition of a fugato interpolated between the Principal Thematic Group and the Subordinate Thematic Group of the first movement.⁸ As marked by rectangles, the beginning and end of each subject entry, and its counterpoint, consistently incorporate elements of the diminished-seventh chord B–D–F–A \flat . Of the additional pitches, those enclosed in parentheses function melodically—as neighbour tones—and those circled are roots of dominant function added a major third below each note, in turn, of the basic diminished-seventh chord, thereby creating a set of minor-third-related dominant-minor-ninth chords. The V \flat ⁹ of C in m. 4 is transformed to V⁷ of A in m. 5 with the substitution of root E in place of G. The dominant-minor-ninth of A occurs in m. 6 and is immediately transformed to V of F \sharp with the substitution of root C \sharp for E. The complete V \flat ⁹ of F \sharp occurs in m. 8, and in m. 9, when D \flat /C \sharp is replaced by the last member of the minor-third cycle of roots—B \flat —elements of the basic diminished-seventh chord serve as part of V \flat ⁵ of E \flat (V \flat ⁹ of E \flat in mm. 10-11).

Because the tonics presented in the fugato's first exposition are equidistant within an octave, none of the four is distinguished as primary. Unlike a I–V–I–V succession of keys for initial fugal entries, in which asymmetrical division of the octave distinguishes tonic and dominant, symmetrical division by tonics sharing the same pitch classes for their respective leading-tone diminished-seventh chords resists establishment of a single primary tonality. In place of one tonic, the fugato exposition establishes a set of four keys of equal status.⁹

Presentation of C, A, F \sharp , and E \flat as a cycle of four equivalent tonics at the opening of the fugato foreshadows the subsequent key scheme of the quartet as a whole. As shown in Ex. 3, all of the more prominent new thematic material following the fugato is introduced in one

⁷Excerpts from Schoenberg's String Quartet, Op. 7 shown in full score or in short score in this article are used with the kind permission of Belmont Music Publishers, Pacific Palisades, California.

Measure numbers referred to in the text and indicated in the examples are from the original edition of the score or the Kalmus reprint. Measure numbers given in parentheses are from the Complete Works edition.

⁸Niederberger uses this passage to demonstrate octatonic patterns in Op. 7. She draws attention to the tonal harmonies produced by these patterns but does not analyze them in terms of tonal function. Niederberger, "Schoenberg's 'Intricate Structure,'" 64-81. Peter Schubert acknowledges functional harmony in the passage, but places emphasis on two contrapuntal ideas that he terms "combination motives." Peter Schubert, "'A New Epoch of Polyphonic Style': Schoenberg on Chords and Lines," *Music Analysis* 12 (1993): 307-10 (hereafter, "'A New Epoch'").

⁹The fugato continues with a "second exposition" that transposes the first up a minor seventh, thereby introducing a new cycle of keys and providing tonal contrast. Two fugato-like passages later in the quartet, mm. C35-48 (mm. 335-348) and mm. G67-98 (mm. 739-770), also employ sets of minor-third related tonics.

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Example 3: Prominent new themes following the first-movement fugato.

a First Subordinate Theme

mm. A 57 (153) 58 59 60

zart bewegt

Eb: $I - IV^{\#6}_5 - I$

b Second Subordinate Theme

A 71 (167)

einfach

C:

c 2d Mov't (Scherzo): Principal Theme

E (399)

Kraftig

Gb:

d 3d Mov't (Adagio): Principal Theme

K (952)

Messig; langsame Viertel

A:

e Finale (Rondo): Principal Theme

M (1122)

Massig = heiter

A:

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or the other of these keys. The first subordinate theme begins in E^b major and the second subordinate theme in C major.¹⁰ The key of the principal theme of the second movement (the Scherzo) is G^b major and the principal themes of the Adagio and Finale are in A minor and A major, respectively.

(2) A cycle of chords created by adding the pitch a major third above the top note of each rotation of a leading-tone diminished-seventh chord

There are two passages in the quartet that employ a cycle of minor-third-related chords created by adding, in turn, the note a major third *above* the top note of each rotation of a basic leading-tone diminished-seventh chord (i.e., notes of the diminished-seventh chord a semitone above the basic diminished-seventh chord). The paradigm behind these passages is explainable as an interaction of the notion of added roots with the theory of major-minor dualism.

Briefly stated, the theory of major-minor dualism holds that whereas major triads are generated upward from their roots, minor triads are a mirror reflection of major triads, generated downward from their "roots" with the same order of intervals, major third–minor third.¹¹ Dualism also exists between dominant and subdominant triads: whereas a dominant triad is characteristically major and constructed upward from $\hat{5}$, a subdominant triad is characteristically minor and constructed downward from $\hat{1}$.¹² Inherent in this notion is another way of creating chords from the leading-tone diminished-seventh chord: a cycle of subdominant-function chords is formed by adding each "root," in turn, that is a major third *above* each note of the diminished-seventh chord. In actual practice, it is to be expected that the minor ninth below the "root," $\hat{7}$, being both an extreme dissonance and inextricably associated with dominant function, is regularly omitted from the subdominant-function chord, leaving a half-diminished seventh chord.

Example 4 is a comparative summary, in the key of A, of how a dominant- and a subdominant-function chord can be formed from a prevailing diminished-seventh chord.

¹⁰The Subordinate Thematic Group can be said to have a third theme, beginning in A^b major at m. A82 (m. 178), but this theme is not motivically distinct from the First Subordinate Theme.

¹¹The theory of major-minor dualism has its origin in the work of Moritz Hauptmann; see *The Nature of Harmony and Metre*, trans. and ed. William Edward Heathcote (London: Swan Sonnenschein, 1888), particularly pp. 14-20. His follower, Arthur von Oettingen, further developed the theory and was the first to apply the term "dual" to this understanding of the relationship between major and minor; see Daniel Harrison, *Harmonic Function in Chromatic Music* (Chicago: University of Chicago Press, 1994), 242-51 (hereafter, *Harmonic Function*). The most famous proponent of the theory was Hugo Riemann; see William C. Mickelsen, *Hugo Riemann's Theory of Harmony: A Study* (Lincoln: University of Nebraska Press, 1977), 52-57 (hereafter, *Hugo Riemann's Theory of Harmony*); and Harrison, *Harmonic Function*, 254-65.

¹²Mickelsen, *Hugo Riemann's Theory of Harmony*, 61.

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Example 4a shows the leading-tone diminished-seventh chord with $\hat{5}$ added a major third below $\hat{7}$, creating a dominant-function harmony rooted on E. The dissonant, minor ninth above is frequently omitted, as shown in Ex. 4b. Example 4c shows the same diminished-seventh chord with "root" $\hat{1}$ added a major third above $\flat\hat{6}$, creating a hypothetical subdominant-function harmony, the (transposed) inversion of the chord in Ex. 4a. As shown in Ex. 4d, in practice, the dissonant minor ninth below is consistently omitted; the result is a half-diminished seventh chord, the (transposed) inversion of the dominant-seventh chord in Ex. 4b. In this way of thinking, chords of subdominant function are characteristically half-diminished seventh chords generated from $\hat{1}$ down to $\hat{2}$ or minor triads generated from $\hat{1}$ down to $\hat{4}$.

Example 4: Comparison of dominant- and subdominant-function chords formed from one diminished-seventh chord.

a b c d

A: $V^{\flat 9}$ V^7 — $ii^{\phi 7}$

The first passage exemplifying a cycle of chords of subdominant function in the quartet has a transitional function. Example 5 shows, in harmonic reduction, the manner in which the varied restatement of the Principal Theme (key of D minor) evolves into the beginning of the bridge to the fugato. As in mm. 2-8 of the original presentation of the theme (not shown), mm. 66-72 expand $ii^{\phi 7}$ of D minor, the subdominant-function chord E-G-B \flat -D. This chord contains the minor thirds E-G and G-B \flat (subsets of $vii^{\circ 7}$ of D), and the major third above B \flat , the tonic D. Departing from the original thematic presentation, m. 73 is a sequential repetition of m. 71/72 (displaying invertible counterpoint, not shown) employing the potentially subdominant-function half-diminished seventh chord created from the minor thirds G-B \flat and B \flat -D \flat (also from D \flat /C \sharp -E-G-B \flat) and exchanging D of the previous chord for F, the pitch class a major third above C \sharp /D \flat . Similarly, the new half-diminished seventh chord in m. 74 contains the minor thirds B \flat -D \flat and D \flat -F \flat from the basic diminished-seventh chord, to which the pitch class a major third above F \flat , A \flat , is added. The pattern breaks in m. 75 when G \flat , a major third *below* B \flat , is introduced to create a G \flat major-minor seventh chord, which proves to be the goal of the passage.

The second instance of a cycle of chords of subdominant function is more telling because

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it comes from an expository rather than a transitional passage. Example 6 shows phrase 2 of the Adagio, which began in A minor. The majority of the chromatic harmonies in the excerpt are explainable as minor-third-related minor triads and half-diminished seventh chords. Each chord beneath the brackets contains a subset of $\text{vii}^{\circ 7}$ of A minor, $\text{G}\sharp\text{-B-D-F}$, and one pitch from the minor-third cycle containing A: $\text{C-E}\flat\text{-F}\sharp\text{-A}$. The first chord contains the basic minor third $\text{F-A}\flat/\text{G}\sharp$ and the pitch class C a major third above; the second chord contains the minor third B-D as well as $\text{F}\sharp$, again a major third above; the third chord contains D-F as well as A, a major third above. The fourth possible minor triad of the cycle occurs in m. 7 (beat 3): $\text{A}\flat\text{-B/C}\flat$ with the addition of $\text{E}\flat$. In each of the next two measures, half-diminished seventh chords are built the same way: the chord that begins m. 8 and is repeated at the beginning of m. 9 is the diminished triad $\text{D-F-A}\flat$ with the addition of C; and m. 9 ends with the diminished triad B-D-F to which A is added.

Notice that the triad at the end of m. 5 progresses as iv of A minor.¹³ All of the triads and half-diminished seventh chords marked in this passage are conceivably subdominant-function chords. They are strung together by virtue of their common origin in a pair of diminished-seventh chords.¹⁴ Like the dominant minor-ninth chords at the endings of subject entries in Ex. 2, these subdominant chords imply their function without necessarily progressing to their tonic triads. But whereas each of the fugato subject entries in Ex. 2 began by stating a new tonic, in this passage only one of the respective tonics, A, is literally present. Therefore, A is the only tonic clearly established in mm. K5-9.

Two of the tonics merely suggested in mm. K5-9 are later made explicit in the key scheme. The key scheme of the Adagio's A section is diagrammed in Ex. 7. The first unambiguous change of key occurs at m. K26 (m. 977) where the material of mm. K5-6 is restated in C minor.¹⁵ Shortly afterward, the opening phrase of the Adagio recurs in $\text{F}\sharp$ minor;

¹³Schubert identifies a "combination motive" within m. 5. Schubert, "A New Epoch," 307, Ex. 17d.

¹⁴The bass line of mm. K6-9, which is in canon with the uppermost melody, sometimes proceeds independently of the harmony implied by the upper parts. It should also be noted that mm. 7-8 are an inexact sequential repetition of mm. 5-6. The first triad of m. 7 begins the sequential repetition a tone higher and therefore does not belong to the same minor-third cycle as the triads of m. 5. The next three chords are again from the original cycle because they depart from exact sequencing. The two minor triads that break the pattern are "secondary subdominants": the G-minor triad of m. 7 is iv of the D-minor triad at the end of m. 5 and the E-minor triad at the end of m. 8 is iv of the B-minor triad at the end of m. 7.

¹⁵A prior modulation to F minor at m. K18 (m. 969), where two measures of the opening theme of the Adagio are heard at the pitch level of F minor, might be supposed. It is not clear, however, that the primary key of A minor has been left in mm. 18-19: A-minor harmony tonicized by its $\text{vii}^{\circ 7}$ returns in m. 20 (m. 971). Detailed analysis shows that throughout the A section of the Adagio the keys A and F function interchangeably in the role of primary key, and not as primary key and secondary key. In corroboration of this notion, the restatement of the Adagio A section at m. L1 (m. 1031) opens in F minor. Of the keys clearly secondary to A minor in the Adagio

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this leads directly to a return of the original key. The key of A minor is thereby surrounded by keys a minor third above and a minor third below.

Example 7: Key scheme of the Adagio A section, mm. K1-33.

m. K1 (952)	m. K26 (977)	m. K30 (981)	m. K33 (984)
A minor	C minor	F# minor	A minor

CHROMATIC "PROJECTIONS" AND CHROMATIC "DOUBLE-NEIGHBOUR" CHORDS

In preparation for the second principle of chromatic harmony to be described, two premises should be stated. First, the functionality of a leading-tone diminished-seventh chord is due to the strong tendency-tone resolutions of its four pitches: the rising motions $\hat{7}-\hat{1}$ and $\hat{2}-(b)\hat{3}$, and the falling motions $\hat{4}-(b)\hat{3}$ and $b\hat{6}-\hat{5}$. Second, following Daniel Harrison in his book *Harmonic Function in Chromatic Music*, I take $\hat{7}-\hat{1}$ to be the characteristic tendency of dominant function and $b\hat{6}-\hat{5}$ to be the characteristic tendency of subdominant function as each relates to tonic harmony.¹⁶ This is consistent with Riemannian dualism, which regards $b\hat{6}$, the third of minor IV, as a "leading tone above," just as $\hat{7}$, the third of major V, is the "leading tone below."¹⁷

Of frequent occurrence in the quartet is a type of chromatic chord of dominant or subdominant function containing one or more chromatic pitches that "replicate" either the $\hat{7}$ or $b\hat{6}$ tendency tone elsewhere within the chord. These chords, too, are reflected in the quartet's large-scale tonal structure. Examples are discussed below in two categories: "Chords containing 'chromatic projections'" and "Double-neighbour chords."

(1) Chords containing "chromatic projections"

Harrison presents an innovative way of explaining particular chromatic tendency tones that are not literal leading tones: he analyzes them as "parallel-motion accompaniments" that are metaphoric "projections" of actual leading tones.¹⁸ In representative chromatic chords of dominant (or subdominant) function, the $\hat{7}-\hat{1}$ (or the $b\hat{6}-\hat{5}$) tendency is simultaneously projected onto another scale-degree, resulting in a chromatic raising (or lowering) of $\hat{2}$ or $\hat{4}$.

A section, C minor and F# minor are the most prominent.

¹⁶Harrison, *Harmonic Function*, 26-34.

¹⁷Harrison, *Harmonic Function*, 26.

¹⁸Harrison, *Harmonic Function*, 106-26.

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Example 8, from the first movement of the composition under discussion, shows an instance of chromatic projection of $\hat{b}6-\hat{5}$ within the leading-tone diminished-seventh chord of $C\#$. In the spelling of the leading-tone chord, $\hat{2}$, $D\#$, has been lowered to $\hat{b}2$, $D\flat$, so that semitone motion $\hat{b}2-\hat{1}$ parallels $\hat{b}6-\hat{5}$, here in perfect fourths in the lower two voices. The progression $\hat{b}2-\hat{1}$ reinforces the subdominant-function tendency-tone motion $\hat{b}6-\hat{5}$. It thereby increases the overall subdominant function of the chord, which now resolves with three descending semitone motions and only one rising semitone—albeit the strong dominant-function motion $\hat{7}-\hat{1}$.

Example 8: $\hat{b}2-\hat{1}$ as a chromatic projection of $\hat{b}6-\hat{5}$ in m. B75 of the first-movement development.

m. B 75 (274)

$C\#$: $\overset{6}{vii} \overset{5}{5} \quad \overset{4}{4} \overset{2}{2} - \overset{6}{i4}$
(altered)

There are two possible chromatic projections of $\hat{7}-\hat{1}$. Example 9, from the third movement, shows one of these in C major: across the bar, $\#\hat{2}-\hat{3}$ in the inner voice parallels the motion $\hat{7}-\hat{1}$ in the uppermost voice. Dominant function for the first chord is strengthened by the presence of root G beneath the leading tone.¹⁹

¹⁹The measures shown in Ex. 9 will also be discussed in their wider context under the heading "Chromaticism resulting from 'mixture' of diatonic collections." Schubert uses these measures to exemplify one of the "combination motives" that he identifies in the quartet. Schubert, "A New Epoch," 307, Ex. 17e.

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Example 9: $\hat{\#}2-\hat{\#}3$ as a chromatic projection of $\hat{7}-\hat{1}$ in m. L14 of the Adagio.

m. L 14 (1044)

C: $V_{\#5}^7 - I$

The other possible projection of $\hat{7}-\hat{1}$ is $\hat{\#}4-\hat{\#}5$. Example 10a shows a hypothetical $vii^{\circ 7}$ of D with $\hat{4}$ raised to $\hat{\#}4$. Example 10b, from the quartet, shows the minor triad on $\hat{7}$ —that is, the leading-tone triad with $\hat{\#}4$ but no chord seventh—progressing to tonic harmony. Notice that not only are the parallel perfect fifths between $\hat{7}-\hat{1}$ and $\hat{\#}4-\hat{\#}5$ undisguised, they are emphasized by octave doublings.²⁰

Example 10: $\hat{\#}4-\hat{\#}5$ as a chromatic projection of $\hat{7}-\hat{1}$.

a Model.

D: $vii_{\#5}^{\circ 7} - i$

b $\hat{\#}4-\hat{\#}5$ in m. I37 at the end of the development section.

(908)

D: $vii_{\#5} - i$

²⁰Harrison, in his discussion of similar instances, argues that because $\hat{\#}4-\hat{\#}5$ accompanying $\hat{7}-\hat{1}$ has the stylistically integral role of reinforcing an essential tendency-tone resolution, such parallel fifths are not to be heard with common-practice-period ears. Harrison, *Harmonic Function*, 124-26. Also on the subject of voice leading by consecutive fifths (and octaves) prohibited on stylistic rather than absolute grounds, see Schoenberg, *Theory of Harmony*, 68-69.

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The progression from a C[#]-minor to a D-minor chord shown in Ex. 10b occurs at a major structural dividing point of the overall sonata form: the move from the last measure of the development section to the first measure of the recapitulation. At a lower middleground level, these two chords encapsulate the motion from the C[#]-minor harmony prolonged in the final measures of the development section to the regained D-minor tonic of the recapitulation of the First Thematic Group. They also reflect the deep middleground level of tonal structure. Detailed study of the development section of the quartet as a whole shows that it begins by prolonging D^b/C[#]-rooted harmony (beginning at rehearsal letter B and ending at letter E), after which the remainder of the development section works toward the regaining of C[#] harmony, which it does definitively in the closing measures of the development, beginning at m. 30 after letter I (m. 901).²¹ In this way, the chromatic foreground motion shown in Ex. 10b, G[#]-A projected from C[#]-D, is imbedded in the deep middleground-level harmonic progression of C[#]-minor harmony prolonged in the development to D-minor harmony for the recapitulation.

A similar progression occurs in the passage sketched in Ex. 11, an excerpt from the Rondo-Finale. The sketch shows how the A-major tonic is regained at m. N68 (m. 1248) for the final statement of the Rondo theme. The chord of approach is the harmony with G[#] in the bass expanded in mm. 63-64. In m. 64, where E3 becomes the lowest pitch, the harmony's dominant function in the key of A is confirmed. The sequentially constructed upper voice of m. 64 reaches D[#], $\hat{4}$ of A, creating the major-major seventh chord labelled V^{#7} of A. Measures 65-67 delay resolution of this harmony to the tonic with elaborative minor-subdominant harmony, but at the last moment—the second half of m. 67—the pitch classes E^b/D[#] and A^b/G[#] return within two-part counterpoint that subtly implies G[#]/A^b⁷ harmony again.

Example 11: Harmonic reduction showing $\hat{4}$ as a projection of $\hat{7}$ in m. N64 of the Rondo-Finale.

mm. N 63 (1243) 64 65 66 67 68

A: vii^φ7 v5 #7 (iv) VII—2 — I

²¹Lynn Cavanagh, "Tonal Multiplicity in Schoenberg's First String Quartet, Op. 7" (Ph.D. diss., University of British Columbia, 1996), 150-216.

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In Ex. 3a, mm. 58-59, an augmented six-five chord of subdominant function in E_b major resolves to tonic harmony. The chromatic pitch class F^\sharp is double-neighbour counterpart to the diatonic pitch class A_b ($\hat{4}$), both theoretically tending toward G , $\hat{3}$. (In this particular instance, $\hat{4}$ occurs in the bass and therefore leaps rather than follows its step-wise tendency in the resolution to I of E_b .)

This progression, occurring near the beginning of the Subordinate Thematic Group, is reflected in the larger harmonic structure of the theme group, sketched in Ex. 13. Upper-voice $\hat{3}$ and E_b -rooted harmony are prolonged in mm. 57-81. In mm. 82-91, the First Subordinate Theme is further developed, first in the key of A_b , whose tonic supports $\hat{4}$ of the overall key. Halfway through this development, the local key shifts to the tritone-related D major, whose tonic supports F^\sharp — $\#2$ of the overall key.²³ As was explained in connection with Ex. 12, D-rooted harmony serves to return the E_b tonic at m. 92. The inclusion of the subsidiary, lower neighbour F^\sharp in the large-scale upper line of the Subordinate Thematic Group, and the deep-level key pattern I-IV-I, were encapsulated earlier in the foreground double-neighbour harmony shown in Ex. 3a, mm. 58-59.

Example 13: Harmonic reduction showing double-neighbour pattern in tonal plan of the Subordinate Thematic Group, mm. A57-92.

mm. A	57	63	70	71	76	78	81	82	85	86	92
	(153)	(167)		(172)			(178)	(182)	(188)		
	$\hat{3}$						$\hat{4}$	($\#2$)	$\hat{3}$		

E_b : I — — — — — v^7 of IV — (VII) — I

²³The shift of key centre from A_b to D is accomplished by means of their common dominant-seventh with lowered fifth in m. A85 (m. 181): $E_b-G-Bbb-Db=A-C^\sharp-E_b-G$. Cf. Ex. 14.

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Examples 14 and 15 illustrate chords resolving with double-neighbour motion around $\hat{1}$. Example 14 contains a "French-sixth" form of V3 of D. The chromatic pitch in the bass, $b\hat{2}$, is the double-neighbour counterpart of $\hat{7}$ in the uppermost voice, both tending outward toward an octave $\hat{1}$. This particular instance of C \sharp and E b as simultaneous neighbour tones to D is excerpted from the coda.

Example 14: $b\hat{2}$ and $\hat{7}$ surrounding $\hat{1}$ in mm. O18-19 of the coda.

m. O 18 (1287)

D:
V3 - I
(Fr.+6)

Example 15 shows in harmonic reduction the establishment of the key of F \sharp in preparation for an F \sharp -minor passage within the composition's overall development section. (The initial F \sharp -major form of the tonic triad in m. 12 is immediately replaced by its minor form in m. 13). In mm. H11-12, the new tonic is established by the French-sixth form of its V3. The bass pitch of this altered dominant, $b\hat{2}$ in F \sharp , is both double-neighbour counterpart to E \sharp and a reflection of the prior modulatory path. The previous thematic entrance at m. H1 was in G minor, its tonic elaborated by forms of its vii $^{\circ}7$ chord (F $\sharp^{\circ}7$) in mm. 4-7. Therefore, the bass G \flat in m. 11 and the F \sharp tonic in m. 12 present a reinterpretation of the relationship between the pitch classes G and F \sharp : from $\hat{1}$ and $\hat{7}$ in G to $b\hat{2}$ and $\hat{1}$ in F \sharp .

Examples 16 and 17 illustrate double-neighbour chords providing semitone motion around $\hat{5}$. Example 16 shows the opening of the quartet. In the subdominant-function (common-tone) French sixth, $\sharp\hat{4}$ —G \sharp —works with B \flat to create double-neighbour motion around $\hat{5}$.²⁴ Example 17 is a harmonic reduction of one of the D-major sections of the Subordinate Thematic Group.

²⁴Severine Neff discusses the large-scale significance of both inflected pitch classes in m. 1, G \sharp and C \sharp , in her article "Aspects of *Grundgestalt* in Schoenberg's First String Quartet, op. 7," *Theory and Practice* 9 (1984): 7-56. See particularly p. 17. Christopher Wintle regards the whole-tone harmonies accompanying the inflected pitches of m. 1 as idiomatic. Christopher Wintle, "Schoenberg's Harmony: Theory and Practice," *Journal of the Arnold Schoenberg Institute* 4 (1980): 52-55. Schubert discovers the first instances of the two "combination motives" within these same chords. Schubert "A New Epoch," 306-307, Exs. 16 and 17.

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Here again, the fifth of the D-major triad is approached by a chord containing pitch classes G# and Bb.

Example 15: Harmonic reduction of mm. G110-H13 of the development section, showing reinterpretation of the semitone Gb-F#.

G 110 H1 4 5 6 7 8 9 10 11 12 13
(783)

G: V - i - vii⁰⁴₂ — [+F] — F#: I - c.t.⁰⁷₄ V⁴₃ - I i
g ← f#⁰⁷ g⁰⁷ → F#
(Fr.+6 on bass G)

Example 16: #4 and 6 surrounding 5 in m. 1 of the quartet.

Example 17: Harmonic reduction showing #4 and b6 surrounding 5 in mm. A89-90 of the Subordinate Thematic Group.

mm. 1 2

D: i - c.t. - i⁶
Fr.+6

mm. A 86(182) 87 89 90

D: I - bVI bvi vii^{cf. 07 07 6}_{#3} #5 - I⁴ —
inverted

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Like the double-neighbour chord of Ex. 3a, mm. 58-59, the double-neighbour chords of Exs. 14 and 16 (excerpted from the coda and the opening respectively) have large-scale structural counterparts—this time at the deepest middleground level of the composition. Example 18 is a chart of the key scheme at this structural level as far as m. N68 (m. 1248). Prior to m. K1 (m. 952), the key of the Subordinate Thematic Group, E \flat major, and the key prolonged by the development section, C \sharp minor, form a large chromatic surrounding of D.²⁵ As may be seen by referring again to Exs. 12 and 8, it is in keeping with emphasis on the semitones D–E \flat and D–C \sharp in the key plan that an approach to the E \flat tonic within the Subordinate Group (shown in Ex. 12), and an approach to the C \sharp tonic within the development (shown in Ex. 8), are both from a D major-minor seventh chord (enharmonically expressed in Ex. 8). Example 18 also shows that the second division of the composition, prior to the coda, is largely in the key of A, surrounded by the key of B \flat for the recapitulation of the Subordinate Thematic Group and by reference to A \flat /G \sharp harmony just before the final A-major refrain of the Rondo-Finale (cf. Ex. 11). The key of A \flat , however, is not nearly as prominent in the second division as was C \sharp in the first division, making this chromatic surrounding less pronounced than the surrounding of D.

Example 18: Two chromatic surroundings at the deep middleground level of the quartet.

Exposition		Dev.	Recapitulation		Adagio		Rondo-Finale			
PTG	STG		PTG		STG		Refrain	Episode 2	Refrain	
m.	A57	B1	I38		K1	L52	M1	N1	62	68
(m.)	(153)	(200)	(909)		(952)	(1082)	(1122)	(1181)	(1242)	(1248)
	D	E \flat	C \sharp	D	A	B \flat	A		A \flat	A

CHROMATICISM RESULTING FROM "MIXTURE" OF DIATONIC COLLECTIONS

In preparation for the last principle to be described, a distinction between two types of chromaticism should be clarified. As is to be expected, in addition to chromatic projections and double-neighbour counterparts, conventional secondary leading-tone functions also occur in the foreground idiom of the quartet. In a D-minor context, when a chord containing G \sharp is followed by A-rooted harmony, the first chord is obviously a form of V of A. In this case, G \sharp occurs neither as a projection of $\hat{7}$ of D nor as mere double-neighbour counterpart to $\hat{b6}$ of D; when followed by A-rooted harmony, G \sharp is the literal leading tone of V. Similarly, in the key of D,

²⁵The term "chromatic surrounding" in reference to a key plan is borrowed from Boulay, "Richard Strauss's *Salome*," 7-10.

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E^b may function within iv of iv as the literal $\hat{6}$ of G minor (or within V^7 of bVI as the literal $\hat{4}$ of B^b), and in D major E^\sharp may function within V of III as the literal $\hat{7}$ of F^\sharp .

The distinction between literal leading tones and chromatic pitches of the type discussed in the previous section makes it possible, in yet another situation, to speak of "mixture" of diatonic collections.²⁶ A chromatic pitch that is motivated as a projection or double-neighbour counterpart in the local key may exert literal leading-tone function with respect to another diatonic collection operating in the wider context. This suggests the coexistence of the diatonic collection in which the chromatic pitch is a replicate of $\hat{7}$ or $b\hat{6}$ and the diatonic collection in which the chromatic pitch is a literal leading tone.

The first example of mixed diatonic collections to be discussed is found in the two broadly played measures that introduce the First Subordinate Theme in m. A57 (see Ex. 19). Measures 55-56 juxtapose prominent presentations of the "French sixths" $B^b-D-F^b-A^b$ and $A-C^\sharp-E^b-G$. As will be shown, it is possible to regard the pair of French sixths as altered dominants in preparation for juxtaposed E^b -major and D-major harmonizations of the First Subordinate Theme, and the second French sixth (m. 56) as a mixture of functions in E^b major and D major.

The chord in m. 56 displays double-neighbour function when it resolves deceptively as $V_{b5}^7-iv^6$ in D: the bass rises a semitone and G stays stationary while C^\sharp and its chromatic double-neighbour counterpart, E^b , surround D. On the other hand, we have already established that the First Subordinate Theme, which begins in m. 57, is predominantly in E^b major (Exs. 3a and 13). In mm. 57-58 (beat 2), the prolonged harmony having B^b in the bass proves to be a contrapuntal variant of V of E^b (Ex. 19). In retrospect, the chord in m. 56 is an altered VII^7/V in E^b . From this point of view, it is the E^b of m. 56 that is diatonic and C^\sharp , its double-neighbour counterpart, that is chromatic. The introductory French sixth chord of m. 55 can now be understood as a form of V in E^b (although not resolving as such). From the perspective of m. 58, by which time the harmony in m. 56 is understood as VII^7/V in E^b , it appears that the harmony in m. 55, being V of the main key, is at a deeper structural level than that of m. 56.

On a yet larger scale, there is another factor to be taken into consideration, suggesting that the two French sixths are equal in structural significance. The consequent phrase of the theme, which cadences in m. 63 on the tonic minor, is immediately followed by a varied repetition of the antecedent. In the varied repetition, the melody is transferred down an octave to the lowest part, and begins with the pitch class on which the consequent ended, $b\hat{3}$ (G^b/F^\sharp), rather than $\hat{3}$. In this form of the melody, F^\sharp , not G, alternates with the original lower

²⁶The notion of "mixture of diatonic collections" is borrowed from William Benjamin in his article "Interlocking Diatonic Collections as a Source of Chromaticism in Late Nineteenth-Century Music," *In Theory Only* 1 (Feb.-Mar., 1976): 32-33.

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Example 19: Introduction to, and first three phrases of, the First Subordinate Theme (mm. A55-66).

A 55 (151) 56 57 58 59 60

zurückhalt. sehr zurückhalt. *zart bewegt*

Eb: Vb_5 $VII\#/V - "V" - I$
 D: $Vb_5 - iv^6$

61 62 63 64

hart, kurz *weich, innig* *sehr ausdrucksvoll*

Eb: - i D: I^6

65 66

D: $N^6 - V2/V - V^6$

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neighbour F/E \sharp . Aside from the lowering of $\hat{3}$, the repetition of the theme employs the same pitch classes as it did originally. The significant difference is that, although essentially untransposed, the phrase is now harmonized in D major, the key that shares with E \flat minor F \sharp /G \flat as its mediant, and the key that was foreshadowed in m. 56 by a form of V of D major. The juxtaposition of harmonizations of the theme in E \flat and in D retrospectively interprets both of the juxtaposed French sixths of mm. 55-56 as literal dominant-sevenths with lowered fifths, thereby confirming that the chord of m. 56 is an altered V 7 in D resolving deceptively just as surely as it is an altered VII 7 /V in E \flat . The pitch-class content of A-C \sharp -E \flat -G is, in a very real sense, a mixture of diatonic collections: it mixes C \sharp , leading tone of D, and E \flat , a tendency tone in B \flat major and G minor, and thereby makes it necessary to think in terms of both diatonic collections at the same time—the one with two sharps and the one with two flats.

To summarize, the foreground-level mixture of two diatonic collections in m. A56—suggesting both VII 7 /V in E \flat and V 7 in D—has its counterpart at a middleground structural level in the two successive versions of the theme—one in E \flat and one in D.

I will give one more example in which mixture of diatonic collections at the harmonic surface is confirmed at the middleground level. Example 20 shows the close of the restatement of the Adagio A section, a restatement that began in the key of F at m. L1 (m. 1031). The passage is dominated by an elaborate approach to an authentic cadence in C major at m. 15—an extremely tame tonal move for this composition. In the approach to the cadence, the pitch class D \sharp occurs four times within harmonies approaching the C-major tonic or its substitutes, always tending toward E, and, in the first three instances, always a full dotted-quarter-note beat value or more. In m. 10, violin 1, D \sharp occurs as an accented passing tone within the cadential six-four; in m. 11, 'cello, D \sharp is part of a common-tone augmented-sixth chord to the following first-inversion C-major triad; in m. 13, violin 1, D \sharp is the third of a B-major-minor seventh chord resolving to C-rooted harmony in the next measure; and in mm. 14-15, as we have already noted, the pitch classes D \sharp -E occur in violin 2 as a parallel projection of B-C in violin 1. In this last occurrence, the leading-tone motion toward E is reinforced by the addition of C \sharp (major-mode $\hat{6}$ of E) to the progression.

The harmony at the end of m. 13 is particularly noteworthy because it admits of more than one interpretation. In the apparently firm C-major context, it is an altered leading-tone seventh chord of C major having $\sharp 2$ and $\sharp 4$ projecting from $\hat{7}$ and completed by major-mode $\hat{6}$. It resolves to tonic harmony heard above dissonant, descending passing tones in the bass. Nevertheless, in light of the insistent emphasis on the leading-tone motion D \sharp -E in this passage, it is worth speculating that the B-major-minor seventh chord in m. 13 is also V of E resolving deceptively to VI of E minor.

The aftermath bears out this impression. For all its long preparation—and its subsequent reinforcement in mm. 15 to 17 (beat 1)—the m. 15 cadence in C major proves to be a "dead

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Example 20: Mixed diatonic collections C and E in mm. L9-18 near the end of the Adagio (texture rhythmically simplified).

mm. L 9 (1039)

10

11

C: $v_4^{\#5} - 6 - 7$ $vii^{\circ 7}$ of $vi - ii^6 - 7$ c.t. Ger.+6 →
(V/F)

12

13

14

C: I^6 $I - VII^{\#5} - I^2 - ii^{\phi 6} - V^4 - 3^{\#5}$
 $v^7/iii - vi^4/ii$

15

16

17

18

C: $I - ii - v^7.bVI - I$
E: $I - v^7 - I$
of bVI

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end." Beats 2 through 4 of m. 17 effect a swift modulation to E major for a codetta-like section that concludes the Adagio. Therefore, E major, not C major, is the actual goal of the entire modulatory passage. I would suggest that in m. 13, pitch classes F \sharp and D \sharp , and in m. 14, C \sharp and D \sharp , are not merely projections of the leading tone of C major but, in addition, represent the diatonic collection of E major-minor mixed with that of C major and owe their primary allegiance directly to the E-rooted tonic they imply. This mixture has its counterpart in the key scheme in the swift readjustment of the conspicuous tonal centre from C to E.²⁷

The scope of this paper does not permit demonstration of the methods by which mixture of keys operates on the deepest middleground levels of the composition. Suffice it to say that Schoenberg's notion that an ostensible main tonic may admit "the rivalry of other tonics alongside it"²⁸ can be demonstrated in detailed study of large passages of the quartet.

CONCLUSION

Three ways in which chromatic harmonies are generated at the foreground level of the composition have been shown to have implications for middleground structural levels:

(1) Instead of the circle of seven chord functions associated with one tonic, certain passages employ a circle of chords representing one function, dominant or subdominant, belonging to a cycle of four tonics. The set of tonics implied on the surface level may return at a deep structural level.

(2) Saturation of the foreground with semitonal and double-neighbour voice leading reflects the quartet's tonal design, which consists of semitone-related keys and complete chromatic surroundings.

(3) Projections of $\hat{7}-\hat{1}$ and $\flat\hat{6}-\hat{5}$ onto other scale-degrees make possible the simultaneous implication of literal leading-tone motions in other keys. Mixture of diatonic collections on the surface level becomes clear when replicated at deeper structural levels.

In its unified approach to surface harmonic idiom and large-scale tonal design, the First Quartet exemplifies the same understanding of musical logic that Schoenberg expounded when discussing the music of the tonal masters. As Patricia Carpenter points out, in his theoretical writings "Schoenberg speaks of the musical idea as pertaining to both the smallest element in

²⁷Given Schoenberg's belief in the "interchangeability of major and minor," E-major and E-minor diatonic collections can be considered to be equivalent here. Schoenberg, *Structural Functions of Harmony*, rev. ed., ed. Leonard Stein (New York: Norton, 1969), chap. VII.

²⁸Schoenberg, *Theory of Harmony*, 153.

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a piece and to the unity of the whole."²⁹ By carrying out this ideal in his own composition, Schoenberg grounded his use of extreme chromatic tonality in the style of the tonal masters he admired.

²⁹Patricia Carpenter, "Musical Form and Musical Idea: Reflections on a Theme of Schoenberg, Hanslick, and Kant," in *Music and Civilization: Essays in Honor of Paul Henry Lang*, ed. E. Strainchamps and M. R. Maniates with C. Hatch (New York: Norton, 1984), 418. Also on the subject of Schoenberg's awareness of musical space organized similarly on more than one structural level, see Patricia Carpenter, "Grundgestalt as Tonal Function," *Music Theory Spectrum* 5 (1983): 15-38.