

FORMS OF STABILITY AND INSTABILITY

in

SCHOENBERG'S STRING TRIO, op. 45

by

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B.Mus., Wilfrid Laurier University, 1999

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF

THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in

THE FACULTY OF GRADUATE STUDIES

(School of Music)

We accept this thesis as conforming  
to the required ~~standard~~

THE UNIVERSITY OF BRITISH COLUMBIA

August 2002

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## ABSTRACT

It has long been acknowledged that Schoenberg's compositions, while exploring the new resources of twelve-tone music, are strongly influenced by, and indeed reflect, traditional approaches to composition. However, many have found it difficult to ascribe to the String Trio elements of a traditional compositional style. The piece is instead heard as a series of contrasting musical ideas that are juxtaposed with one another.

This paper will show that while the "surface" of the Trio has elements of discontinuity there persist several unifying factors. The String Trio is shown to be structured around a contrast between stability and instability, these two poles being associated with different characteristic features. Stable passages are typified by a balanced construction or determinate formal process, a stable metre (or predictable metric change), continuity in serial derivation, and processes of retrograde and inversion. By contrast, unstable passages generally feature many different musical ideas, metric complexity and ambivalent phrase structure. These unstable passages often lead away from, or towards, the stable passages through the gradual processes of *liquidation* and *transition* and lessen the sense of juxtaposition between contrasting musical ideas. In addition, the process I will call *developing liquidation* allows the characteristics of a musical idea to be developed at the same time that the previously established stable musical idea is being liquidated.

The formal types of stability and instability will be explored through analyses of individual passages in the String Trio. It will be shown that passages characterized by stability are structured in a similar manner throughout the Trio, and that unstable passages also share their own common structural shapes. This makes it possible to distinguish between the stable and unstable forms and also creates elements of cohesion in the Trio.

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## INTRODUCTION

Schoenberg's String Trio has proved to be one of his most enigmatic works. The texture of the piece is complex, alternating between aggressive bursts of sound and moments of repose that are striking in their traditionalism. Added to the musical complexity is the tantalizing suggestion of a non-musical program as indicated by Schoenberg's own comments that the Trio serves as a " 'humorous' representation of my sickness".<sup>1</sup> Recently there has been some attention focussed on the work and, in particular, Michael Cherlin's article "Memory and Rhetorical Trope in Schoenberg's String Trio" has brought much insight to the Trio by exploring both musical and philosophical issues.<sup>2</sup> Despite recent gains, however, there is still a need for a greater understanding of the musical structures of the String Trio.

When listening to the Trio one soon realizes that finding a consistent traditional form for the piece would prove to be a difficult challenge. Individual passages seem to have little in common with each other and this quality has led some analysts to assert that the Trio is nothing more than a series of disjointed and contrasting ideas.<sup>3</sup> This paper, however, will show that there is continuity in the Trio and that it is achieved by developing the attributes of stability and instability to the point that they are recognized as formal types. For the purposes of this paper, a passage will be considered stable if the following attributes are present: formal balance (usually

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<sup>1</sup>Arnold Schoenberg, "Mein Todesfall (My Fatality)" in Walter B. Bailey, *Programmatic Elements in the Works of Schoenberg*, Studies in Musicology 74 (Ann Arbor: UMI Research Press, 1984), 152. See pages 151-157 in Bailey's book for further discussion of possible programmatic elements in the Trio.

<sup>2</sup>Michael Cherlin, "Memory and Rhetorical Trope in Schoenberg's String Trio," *Journal of the American Musicological Society* 51/3 (Fall, 1998): 559-602.

<sup>3</sup>Cherlin "Memory and Rhetorical Trope"; Boykan "The Schoenberg Trio: Tradition at an Apocalyptic Moment" in *Music of My Future* ed. Reinhold Brinkman and Christoph Wolff (Cambridge Mass.: Harvard University Music Department, 2000); and Bailey *Programmatic Elements* discuss discontinuity in the Trio.

in the form of an antecedent-consequent structure), consistent serial derivation, motivic unity, and metric cohesion (though not necessarily as notated). I will call a passage unstable if it displays metric complexity, a lack of regular formal structure, and is characterized by series of short, contrasting, motivic ideas. The development of these typically amorphous concepts into formal types means that a passage can be characterized according to whether it projects stability or instability. A musical idea can therefore be recognized as being associated with other passages in the Trio, even if the two passages present different thematic or motivic material, as long as they both project one of the formal types. The analyses in this paper will focus on individual passages and, in doing so, will indicate how the consistent approach to projecting stability and instability serves to unify the String Trio. Though restricted to only a few passages the analyses offered here are reinforced by other passages throughout the Trio, as will be indicated in the concluding chapter of this study.

Chapter 1 introduces the central concepts of this paper with the brief analysis of a passage that occurs early in the String Trio. The example contains both stable and unstable elements that are, in turn, used to formulate guidelines for assessing the stability and/or instability of a specific passage. By introducing these concepts in the context of a musical example, Chapter 1 provides the groundwork for the rest of the paper.

Chapter 2 focusses on three passages, all written in the genre of a waltz, which exhibit the characteristics of stability outlined in Chapter 1. Stability within these passages is shown to result, in part, from the following compositional techniques: serial derivation, the development of rhythmic motives, and the clear projection of metre and hypermetre. All of these features contribute to the formation of traditional phrase structures.

Chapter 3 provides examples of instability that are sometimes assumed to be juxtaposed (the placement of contrasting musical ideas in close proximity without intervening material) with the more stable passages. In fact, blunt juxtaposition is a rare occurrence in the Trio and one function of the unstable passages is to provide a gradual process of change between contrasting stable passages. This change is achieved by the gradual elimination of the features of a musical idea (*liquidation*) which is sometimes, though rarely, followed by a gradual introduction of characteristics in preparation for a new musical idea (*transition*). The unstable passages function as connectives, but the process of *developing liquidation* (the development of musical features in the midst of a liquidation) makes them very significant musical events. In order to best explore this connection between the stable and unstable passages, the analyses in Chapter 3 will be restricted to passages which surround the waltzes studied in Chapter 2.

In a manner similar to several of Schoenberg's late works, the String Trio features a source hexachord as a fundamental unit of composition. In the case of the String Trio a (012367) hexachord is used almost exclusively, and is grouped to form both 12 and 18-note rows.<sup>4</sup> Throughout the Trio, the (012367) hexachord is ordered in four different orderings (shown below) which will be labelled individually. The notation used here combines the pitch classes with their associated order numbers (written above and below the hexachords pitch classes) so

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<sup>4</sup>Opinions vary regarding the significance of the hexachord. Ethan Haimo, "The Late Twelve-tone Compositions," in *The Arnold Schoenberg Companion* ed. Walter B. Bailey (Westport Connecticut: Greenwood Press, 1998) argues that the hexachord is grouped with different orderings of the same set class to form 18-note and 12-note sets and Cherlin *Memory and Rhetorical Trope*, also points to the hexachord as a generator of the two basic sets. In contrast Martha Hyde *Schoenberg's Twelve-Tone Harmony* (Ann Arbor, Michigan: UMI Research Press, 1982) focuses solely on the 12-note and 18-note sets. Silvina Milstein *Arnold Schoenberg: notes, sets, forms*. (Cambridge: Cambridge University Press, 1992) focuses more on dyads and tetrachords as harmonic source-sets and searches for tonal implications in the rows. The hexachord labels used in this paper were adopted from Kurth "Mosaci Isomorphism and Mosaic Polyphony." PhD. diss., Harvard University, 1993 who derived his labels from an unpublished typescript by David Lewin, 1960.

that in subsequent analyses order numbers can be added to the musical score to indicate clearly how the hexachords in question are distributed in the texture.

$$\begin{array}{c} 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \\ W_0 = \{D, B_b, E_b, A, E, C\# \} \end{array} \qquad W_n = T_n W_0$$

$$\begin{array}{c} w_0 = \{G, B, F\#, C, F, A_b \} \\ 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \end{array} \qquad w_n = T_n w_0$$

$$\begin{array}{c} 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \\ X_0 = \{B_b, D_b, E_b, D, E, A \} \end{array} \qquad X_n = T_n X_0$$

$$\begin{array}{c} x_0 = \{B, G\#, F\#, G, F, C \} \\ 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \end{array} \qquad x_n = T_n x_0$$

$$\begin{array}{c} 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \\ Y_0 = \{E, D, B_b, A, C\#, D\# \} \end{array} \qquad Y_n = T_n Y_0$$

$$\begin{array}{c} y_0 = \{F, G, B, C, A_b, G_b \} \\ 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \end{array} \qquad y_n = T_n y_0$$

$$\begin{array}{c} 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \\ Z_0 = \{D\#, E, C\#, B_b, D, A \} \end{array} \qquad Z_n = T_n Z_0$$

$$\begin{array}{c} z_0 = \{F\#, F, G\#, B, G, C \} \\ 0 \quad 1 \quad 2 \quad 3 \quad 4 \quad 5 \end{array} \qquad z_n = T_n z_0$$

Upper and lower case labels with the same letter and index number are combinatorial inversions and aggregates of this type will be referred to as combining hexachords of “like” orderings because they maintain the same interval structure. Any two hexachords with the same index number and same letter case (upper or lower) have the same pitch class content and differ by ordering only (*i.e.*  $W_n \cong X_n \cong Y_n \cong Z_n$  and  $w_m \cong x_m \cong y_m \cong z_m$ ). Thus, an aggregate may also be formed by combining two hexachords with different letters and cases (one upper and one lower) in order to create an aggregate of “different” orderings.

## CHAPTER 1.

### PRELIMINARY EXAMPLE

Most of this thesis will focus on what I will call “stable” waltz sections and on the passages that surround them in the String Trio. The central concepts of the thesis are introduced here in Chapter 1 with the study of a passage that has elements of both stability and instability (mm. 12-17). By establishing grounds for calling a passage stable or unstable, the analysis of mm. 12-17 will provide the necessary tools for commenting on other passages in the Trio. No final decision will be made with respect to the stability or instability of this particular passage or its components; instead, a study of its properties will delineate concepts of stability and instability that will be considered throughout this thesis.

#### Analysing Stability

For the purposes of this study, a passage is considered stable when the following characteristics are present: a systematic presentation of hexachords which, due to the combinatoriality of the (012367) hexachord, often leads to an RI palindrome; consistent serial derivation that results in motives of several types; and metric cohesion. These factors combine to project a formal balance that frequently takes the form of an antecedent – consequent phrase group. These elements of stability will be clarified and expanded upon in the following pages of this thesis.

Measures 12-17 mark the first occurrence of a passage that exhibits motivic unity and reaches a clear conclusion. The preceding eleven measures feature a series of short figures that are developed motivically, to a certain extent, but never cohere as a group. Given the volatility

of mm. 1-11, mm. 12-17 exhibit comparative stability. However, stability is not solely determined by context and the following analysis briefly outlines several of the constructions and processes used to create stability in the passage.

With the exception of this passage's recapitulation in mm. 214-221, mm. 12-17 are the only statement of an 18-note set built from three forms of the (012367) hexachord. Two different orderings of the hexachord in the same transposition frame one statement of its inverted complement, which uses a third ordering. Expressed with the hexachord labels given in the introduction, the set  $\langle W_0, x_0, Y_0 \rangle$  is used as the basis for the music in mm. 12-14. The next three measures (mm. 15-17) are derived from  $RI_9$  of this 18-note set; since  $I_9$  maps the 0-level hexachords to their complements, mm. 15-17 are derived from  $\langle Ry_0, RX_0, R_w0 \rangle$ .<sup>5</sup> The hexachords are indicated on the score in Example 1.1 below.

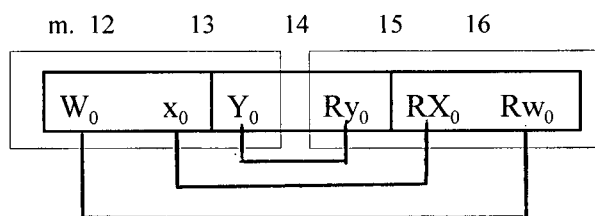
The use of the retrograde inversion at this transposition level results in an inversive palindrome of the hexachord orderings, as indicated by the two large boxes on Figure 1.1. Measures 15-17 are not a pitch retrograde of mm. 12-14 because each hexachord is the complement of the corresponding 'mirrored' hexachord in mm. 12-14. However, the  $RI_9$  relationship between a hexachord and its complement means that the onset of  $Ry_0$  (in m. 15) creates a retrograde-inversion of  $Y_0$  and thus the intervals of the violin line in mm. 15-17 are a retrograde-inversion of mm. 12-14.

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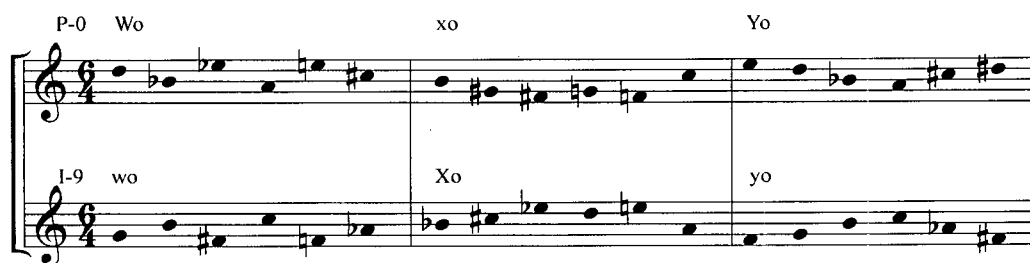
<sup>5</sup> The use of an 18-note set may seem unusual within the context of Schoenberg's twelve-tone works but the serial analysis of this passage as it is presented above is supported by Schoenberg's sketches which provide proof that he did conceptualize such a set. See *Arnold Schönberg Sämtliche Werke Abteilung 6: Kammermusik, Reihe B, Band 21*, ed. Christian Martin Schmidt (Mainz: B. Schott's Söhne, 1984), 114 in which three hexachords are grouped to form the 18-note set used in mm. 12-17. See also Hyde, "The Roots of Form," 22-33.

### Example 1.1 – Measures 10-17

Handwritten musical score for guitar, showing measures 10 through 17. The score includes various musical notations such as treble and bass staves, dynamic markings (pizz., arco, ff, sf), and tempo markings (J. = 90). The score is divided into measures by vertical bar lines, with some measures containing multiple staves. The handwriting is in black ink on a white background.

**Figure 1.1 – Hexachords (mm. 12-17)**

The  $I_9$  relationship between the two sets results in three orderings of each of the two complementary hexachords: the set  $\{A, B\flat, C\sharp, D, E\flat, E,\}$  appears as  $W_0$ ,  $Y_0$ , and  $RX_0$ ; its complement,  $\{F, F\sharp, G, A\flat, B, C\}$ , appears as  $x_0$ ,  $Ry_0$ , and  $Rw_0$ . This relationship is indicated in Figure 1.2 which reproduces the 18-note set and its  $I_9$  transform (the retrograde of which is played in mm. 15-17). By reading Figure 1.2 in a clockwise manner the presentation of the hexachords as they appear in mm. 12-17 becomes apparent.

**Figure 1.2 – 18-note Set and  $I_9$  Transform (mm. 12-17)**

The smaller boxes on Figure 1.1 (above) indicate that the presentation of the two 18-note sets completes the aggregate three times. The initial  $W_0$  and  $x_0$  hexachords, in mm. 12-13, complete one statement of the aggregate as do the unions of hexachords  $Y_0 + Ry_0$  and  $RX_0 + Rw_0$ . The figure shows that the aggregates in m. 12 and mm. 15-16 are completed by pairing different orderings of the (012367) hexachords. The  $Y_0/y_0$  aggregate at the centre of the passage in mm. 14-15 is significant as the only consecutive statement of like orderings of the (012367)

hexachord and it connects the two statements of the 18-note set, making a subtle signal of the emerging palindrome construction. Additional indicators of the palindrome in the music will be discussed shortly. It is significant to note at this time, however, that the link between mm. 14 and 15 is obscured by two events. First, m. 15 is a retrograde of the complement of the hexachord in m. 14, and therefore is derived from different pitches (but the aforementioned retrograde-inversion helps to off-set this change). In addition, the rhythmic figures in m. 15 are altered significantly.

As indicated by the nested square brackets below Figure 1.1, and alluded to above, the overall stability of this passage is produced by the application of a consistent procedure –  $RI_9$  – to the hexachord succession of mm. 12-14. The result is that the hexachord orderings in mm. 15-17 are a retrograde of those in mm. 12-14. The palindrome that emerges is hard to hear, because texture and rhythm complicate the perception of hexachord orderings, but the symmetrical pairing of hexachords and their complements increases the serial stability of the passage by adding yet another unifying element. The symmetry that results from the hexachords of mm. 15-17 being so closely linked to those in mm. 12-14 provides further support for viewing mm. 12-17 as a single unified musical structure.

In addition to providing unity to the passage, the use of the 18-note row also creates an internal division because the start of its retrograde inversion coincides with several textural changes. First, the use of harmonics by the viola and cello is discontinued in m. 15 with a shift to *pizzicato* in those instruments; the violin line simultaneously changes from *pizzicato* to *arco*. There is also a noticeable change in the rhythm of the accompaniment in m. 15 when the use of dotted quarter notes is discontinued. These elements provide a subtle, but distinctive, change

between mm. 14 and 15 so that the transition between the two statements of the 18-note set is projected. The result is the subdivision of mm. 12-17 into two (approximately) three-measure segments.

Another stabilizing factor in this passage is the systematic approach to dividing the hexachords between the violin and accompaniment. In mm. 12-17 the violin plays a series of twelve pitches that are grouped into semitone dyads. Figure 1.3 shows that the dyad in each measure comprises the first and last pitches (order numbers <0,5>) of the current (012367) hexachord. The order numbers are retrograded to <5,0> in m. 15, a change which coincides with the segmentation suggested above. The semitone dyads from each hexachord result in an ordered

**Figure 1.3 – Serial Derivation of the Violin Line (mm. 12-17)**

order numbers <0 5> <0 5> <0 5> <5 0> <5 0> <0 5> <5 0>

aggregate in the violin line: <D,C#> <B,C> <E,D#> | <F#,F> <A,Bb> <Ab,G>. The angle brackets indicate the semitone dyads derived from each (012367) hexachord. The vertical line (|) indicates the start of the retrograde-inversion of the 18-note row in m. 15, subdividing this “derived” 12-note row into two (012345) hexachords that coincide with the subdivision of mm. 12-17 into two three-measure segments. The “derived row” is another example of the serial stability in this passage since each note of the violin contributes to the presentation of two

aggregates and two hexachords. In addition, the second (012345) hexachord is related to the first by a function of  $RI_9$ .

Motivic unity also provides an element of stability to this passage. The violin line can be grouped into two different types of motive. The first type involves the violin's semitone dyads in each measure. Each measure of the violin line (through m. 14) rhythmicizes these dyads as a quarter rest, a half note, and a dotted half note. These three elements are differently ordered in each of mm. 12-15, making it difficult to predict the shape of each subsequent dyad – plus a rest motive. Table 1.1 indicates, however, that the three rhythmic elements are in fact “rotated” in each measure. (The rhythmic elements are numbered according to their placement in m. 12, and that numbering also coincides with their relative duration.)

**Table 1.1 – Rhythmic Elements of Violin Line (mm. 12-17)**

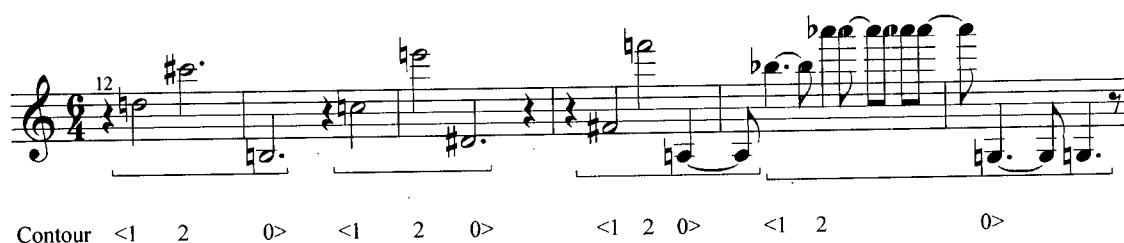
Measure	Rhythmic Elements	Numeric Representation
12	$\dot{\epsilon}$ $d$ $d.$	“123”
13	$d.$ $\dot{\epsilon}$ $d$	“312”
14	$d$ $d.$ $\dot{\epsilon}$	“231”

The numeric representation clearly shows the systematic approach to the presentation of the rhythmic elements within each measure. The last duration (or rest) of each measure is shifted to be the first duration of the following measure and the remaining durations are always presented in the same order. Despite this systematic process, which suggests an element of stability, a direct result of this reordering of durations is an apparently irregular placement of attacks in the

violin line. The *pizzicato* articulation further disrupts the systematic process observed in Table 1.1 because no pitch is heard for its full duration. This motivic process is followed by a breakdown into shorter rhythmic values which starts at the end of m. 15 and continues into m. 17, a factor which will be significant in the discussion of instability in this passage.

A second type of motive results from similarities in contour that are, at least initially, clearly demarcated. Figure 1.4 shows that the violin line can be heard as a set of four trichords, each with the same contour of <120>. The first three statements of the motive (henceforth referred to as the ‘contour motive’) occur in similar durations and are separated by (one or two) quarter rests.

**Figure 1.4 – Contour Motive (mm. 12-17)**



The last statement of the contour motive in mm. 16-17 is slightly altered: it directly follows the third statement (without a rest) and also involves the repetition of pitches. Similarities between the various statements of the contour motive are shown in Table 1.2. The first line, “interval in semitones”, notates the intervals according to the number of semitones between the pitches of the contour motive. The second and third rows of the table, showing the ordered pc intervals and set class of each trichord respectively, reveal that the trichordal contour-motive segmentation of the

violin line brings out particular features of the palindromic structure involving the 18-note set (mm. 12-14) and its retrograde inversion in mm. 15-17. On the table a plus sign (+) indicates that an interval rises and a negative sign (-) indicates a descending interval.

**Table 1.2 – Intervals of Contour Motive (mm. 12-17)**

Motive	1 (m. 12-13a)	2 (m. 13b-14)	3 (m. 15)	4 (m. 16-17)
Interval in semitones	<+11,-26>	<+16,-25>	<+23,-32>	<+10,-32>
Ordered pc interval	<11,10>	<4,11>	<11,4>	<10,11>
Set class	(013)	(014)	(014)	(013)

The preceding analysis has shown that several serial structures (outlined in Figures 1.1 and 1.3) and motivic processes (Table 1.2) are completed in m. 17 which suggests that mm. 12-17 are a self-contained musical idea. This interpretation is reinforced by several textural features which create closure. In m. 17 the half notes in the viola and cello, even though they are played tremolo, are a sudden change from the eighth-note triplets in m. 16. The metric issues surrounding this sudden shift will be discussed below as an element of instability in this passage. It is sufficient at this time to point out that the relatively longer durations in all instruments in m. 17 (as compared to m. 16) have the effect of bringing the music, which was increasing in attack density, to a sudden (if momentary) halt that is suggestive of closure.

The conclusion of the passage is also indicated by a change in the presentation of the hexachords in mm. 15-17. Table 1.3 shows the duration associated with each hexachord in the passage.

**Table 1.3 – Durations of Hexachords (mm. 12-17)**

$W_0$	$x_0$	$Y_0$	$Ry_0$	$RX_0$	$Rw_0$
o.	o.	o.	o d	d..	o...

Because  $Ry_0$  shortens the duration of the previous hexachords  $RX_0$  enters a quarter note earlier than expected.  $Rw_0$  enters even “earlier” however so that  $RX_0$  lasts for only  $3 \frac{1}{2}$  beats in total. The difference of only a few beats may not seem to be consequential, but when combined with the increased attack density in all instruments, the resulting condensation of the pitch content increases the intensity of the passage as it moves towards its conclusion. The shortened statements have the effect of increasing the intensity of the passage. Schoenberg referred to this process as “condensation”: placing constituents closer together so that “the space in question is more densely filled with content,” and he considered it appropriate for climaxes as well as conclusions.<sup>6</sup> The last hexachord, in seeming contrast to the preceding events, is the longest of the passage and lasts  $7 \frac{1}{2}$  beats. This extension also provides closure because it has the effect of a notated fermata.

### Analysing Instability

The preceding remarks have focussed on stable or regular aspects in the passage, but have also made several allusions to some unstable elements. The first example of instability to be studied, and among the most immediately apparent, is the lack of a clear pulse in the violin line

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<sup>6</sup> Arnold Schoenberg, *The Musical Idea and the Logic, Technique, and Art of its Presentation*, ed. and trans. Patricia Carpenter and Severine Neff (New York: Columbia University Press, 1995), 251.

(or indeed any of the instruments).<sup>7</sup> A pulse, which imparts a forward-striving “momentum” for the rhythm, provides stability (even though stability typically means “static” and “unchanging”) by projecting a pattern of accents that enables the development of small-scale rhythmic figures which may combine to form larger hypermetric groups. As such, a pulse lends an element of predictability to a passage. In mm. 12-17 the durations of the violin line (a dotted half note, half note, and quarter rest) “fit into” the notated 6/4 metre, but the “reordering” of the durations, as indicated in Table 1.1, causes pitch attacks to occur at irregular time intervals that do not unambiguously support a dotted-half-note pulse. In addition, the rhythmic figures of the viola and cello lines do not persist long enough to provide an element of metric stability; the dotted quarters in mm. 12 and 13 undermine any sense of a quarter-note sub-pulse that might emerge from the violin as do the syncopated quarters in those two measures; finally the eighth notes in m. 15 are interrupted by a half-note tremolo in m. 16, followed by a shift to triplet-eighths. Combining the tremolo with the sudden increase of attack density in the violin line, m. 16 loses almost all rhythmic connections with the earlier music of the passage. The result of these rhythmic ‘inconsistencies’ is that mm. 12-17 never clearly project the notated metre.

The metric instability of this passage is not only the result of rhythmic figures failing to align with the notated metre; it is also due to a heightened level of metric complexity. In mm. 12-13 the violin allows a duple division of the bar, between the pairing of the half note and quarter rest and the later dotted half note. The viola and cello lines in mm. 12-13 also feature a

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<sup>7</sup> John Roeder’s definition of pulse in “Interacting Pulse Streams in Schoenberg’s Atonal Polyphony,” *Music Theory Spectrum* 16/2 (Fall 1994) is used for this paper. By his definition a pulse is “a series of successive, perceptibly equal time spans, marked off by accented time points.” (234) In order for a pulse to be established two successive equal time spans must be present.

duple division: one half of the measure groups three eighth notes, a quarter note, and an eighth rest and two dotted quarter notes complete the measure. The dotted quarter notes and eighth notes could support an interpretation of 12/8 in the viola and cello and this is in conflict with the 6/4 metre that the violin could support.

This conflict is an indicator of the metric complexity which continues throughout mm. 12-17. John Roeder's technique of pulse-stream analysis provides a valuable way to determine how the metric complexity of this passage is achieved. Roeder analyzes two pieces from Schoenberg's *Pierrot Lunaire* which have many characteristics in common with mm. 12-17 of the String Trio, and he notes how rhythmic figures with a "diverse arrangement of accents" combine to create passages which do not conform to the notated metre.<sup>8</sup> Roeder suggests that analyses of such passages tend to focus on traditional views of metre, which typically only allow for the possibility of one metre in a time span, and he argues that these analyses do not provide a thorough understanding of the intricacies of the music. Instead he suggests a theory of rhythmic polyphony in which two or more concurrent "pulse streams" are created by regularly recurring accents. This approach "analyzes an irregular surface as the sum of several concurrent regular continuities . . . ."<sup>9</sup>

The first step in Roeder's analytical technique is to determine the pulses that occur in a passage. A well-established pulse has a high number of successive time spans and each time span is emphasized by any, or all, of duration, dynamic or contour accents. Similarities in pitch, duration, timbre, and other properties, will enable time spans to be heard as belonging to the

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<sup>8</sup>Roeder, "Interacting Pulse Streams," 231.

<sup>9</sup>Ibid., 232-233.

same pulse. With the aforementioned common properties in place, attacks can occur in different textural voices and still be considered part of the same pulse. The central tenet of Roeder's theory is that more than one pulse may occur in a passage and thus metre is shown to be polyphonic in a manner similar to pitch. The term *pulse stream* is used to denote the independent nature of each pulse. Roeder points to two "governing principles" in pulse-stream analysis. First, "every time point that is strongly accented in a texture must contribute to a pulse stream." Second, any accent may be a part of several pulse streams.<sup>10</sup>

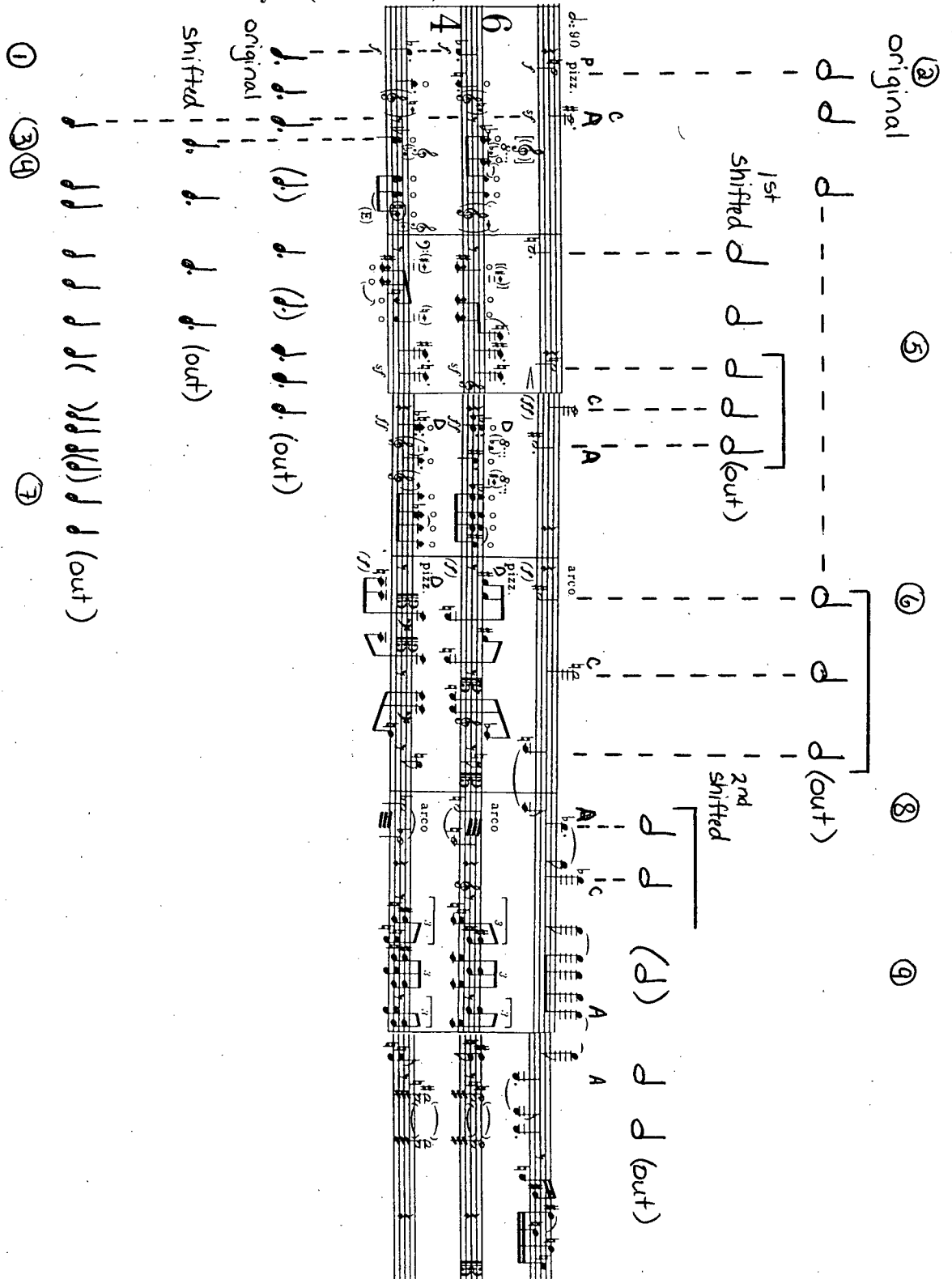
Measures 12-17 are reproduced in Figure 1.5 and following Roeder's approach, the pulse streams are notated below and above the score. The onset of a pulse stream is indicated with a dotted line connecting the pitch in the score with the corresponding duration in the pulse stream analysis. Roeder's annotations for durational accent (A), dynamic accent (D), and contour accent (C) are also notated on the example. The circled numbers above and below the example indicate the order in which the characteristics of this passage will now be discussed.

- 1) As suggested above, the viola and cello begin by projecting a 12/8 metre, made evident by their initial durations, which is indicated by the presence of a dotted quarter note pulse stream (labelled the "original"). The first attacks in both instruments are in contrast to the previous material and act as onset accents which serve to clearly initiate the pulse. The doubling of these attacks also provides emphasis to the start of the dotted quarter-note pulse.
- 2) The violin is quite distinctive from the accompaniment and its first attacks are emphasized by sudden absence of attacks in the accompanying instruments. The initial durations of the violin line seem to clearly initiate a half-note pulse stream. However, as indicated above in Figure 1.3,

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<sup>10</sup>Ibid., 234.

**Figure 1.5 – Pulse Stream Analysis (mm. 12-17)**



the attacks in the violin line occur at irregular intervals and for the half-note pulse to continue it is necessary to extract attacks from other instrument that are not clearly accented. In order to establish a pulse there must be three successive time spans and while an attack does occur at the expected interval, with the durational accent of a quarter note in the viola line, it is not accented because the continuing eighth notes in the cello serve to obscure the durational accent. As a result of these weak accents, the equal durations of this half-note pulse stream are difficult to hear. Thus, though the line is notated as the “original half-note” pulse, the half note attacks do not combine to establish a dominant pulse stream.

3) It was mentioned above that the accompaniment voices (viola and cello) feature two rhythmic figures: the dotted quarter notes, and the eighths-and-quarter grouping (in two variants exchanged by the viola and cello in mm. 12b-13a). It is the onset of the eighths-and-quarter note figure that initiates a “shifted” dotted quarter-note pulse. (The term “shifted” indicates a pulse with the same time spans as a previously identified pulse, but its accents are off-set from the “original”.) The increase in attack density, in comparison to the preceding dotted quarter notes, as well as the contour accent in the viola serve to emphasize the onset of this pulse-stream. The initiation of a shifted pulse stream while the “original” pulse stream continues results in some of the metric complexity of mm. 12-17.

4) The slurs in the viola and cello lines in mm. 12-13 delineate every quarter-note beat.

Although no pulse is assumed in pulse stream analysis, even with the presence of a notated metre,<sup>11</sup> this quarter-note pulse stream clearly coincides with the notated tactus of 6/4. The attacks of the shifted dotted-quarter note pulse are accented by the quarter-note durational accents

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<sup>11</sup>Ibid.

in the viola and cello. A significant point in relation to this time point is that the expected accent of the original dotted-quarter note pulse stream does not occur, but this does not mean that the pulse stream has been dissolved. While it is necessary that a pulse stream be reactivated at regular intervals in order to be maintained (*persist*), a pulse stream that has been well established can persist without the reactivation of accents.<sup>12</sup> In this case, the dotted quarter-note pulse stream has been clearly established, as indicated above, and though the attack on the dotted quarter note beat is not accented, the pulse stream does continue and thus the attack is enclosed in parentheses. (The parenthesis is a convention used by John Roeder to indicate that a pulse stream persists despite a one-time lack of accent at the time point when it is expected.)

5) A “shifted” half-note pulse stream begins on the downbeat of m. 13, coinciding with the end of the original half-note pulse. The initial half-note attacks all occur in the same instrument (a rarity for this passage) which clearly establishes the shifted half-note pulse. The consecutive attacks in the violin line are indicated by a square bracket on the figure. At the same time, the accompaniment voices begin to undergo a significant shift which results in the dissipation of both dotted quarter- note pulse streams. The dissipation occurs when the viola and cello lines resume their accompaniment figures in m. 14 because the rhythmic figures occur an eighth note later in the measure than when they occurred previously. Also at this time point, the quarter-note pulse stream is briefly weakened, though it does not dissipate, because there are no accents to reinforce the attacks.

6) The original half-note pulse stream is briefly restored by the third statement of the contour motive in the violin line and the pulse is emphasized because, once again, three attacks occur in

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<sup>12</sup>Ibid.

the same instrument. There is a clear parallel to the violin's previous three-note grouping (in mm. 13-14), which occurred in the context of the shifted half-note pulse stream. The figure is also indicated by a square bracket to indicate the grouping parallelism between the motives.

7) The accompaniment undergoes a significant shift in m. 15 so that even the quarter-note pulse is no longer supported because accents of contour and dynamics are not evenly spaced, and the rests occur at irregular intervals. As a result there are no consistent pulse streams in the accompaniment through to the end of the phrase.

8) The restoration of the original half-note pulse stream is quickly replaced by a second shifted half-note pulse stream which is established by three consecutive durations in the violin line, notated by a square bracket to reinforce the relationship to the aforementioned occurrences of this grouping.

9) The third attack of the second shifted half-note pulse stream is not accented, and thus is weakened, but the pulse stream clearly continues until the end of the phrase with the contour accents in the violin line which coincide with expected attacks in the pulse stream.

As can be seen from Figure 1.5, the dotted half-note pulse, which aligns with the notated metre, ceases to be a dominating factor by the conclusion of the passage. Thus the pulse-stream analysis supports the initial assumption that the passage does not conform to the notated metre. It is significant to note, however, that no pulse stream is dominant. The half-note pulse streams, which have moments of strong emphasis, are unable to maintain a continuous presence through to the conclusion of the passage. Thus, the metric instability of this passage is not due to the presence of concurrent pulse-streams which, if maintained, would actually point to a heightened stability. Instead, the multiple pulse streams are only concurrent at the start of the phrase, and the

half-note pulse stream, which does become predominant, is shifted twice while the original dissipates. As a result, changes in the controlling pulse actually create instability in the passage.

### Summary

The preceding analysis of mm. 12-17 reveals that stability results (in part) from serial derivation as well as similarities in interval structure (as in the violin's contour motive). In addition to these processes, the (012367) hexachord is divided between the violin and accompaniment so that the violin consistently plays the pitches from the same position in each hexachord (order numbers  $\langle 0,5 \rangle$ ). These structures and processes are organized in such a manner as to create forms, such as palindromes, that support the internal division of a single phrase and stabilize the passage. At the same time, the complex rhythmic and metric processes studied in the pulse-stream analysis of Figure 1.5 demonstrate unstable aspects of the passage.

Since mm. 12-17 have elements of both stability and instability, it should be clear that instability is not simply characterized by a lack of stable constructions and processes. Instability is indicated by several elements including: the interjection of contrasting figures (for example the triplets in m. 15, in the viola and cello, followed by half-note tremolos in m. 16), the obscuring of motivic relationships (as in the large leaps of the contour motive), and metric complexity. As the analysis has shown, every passage in the String Trio will entail stable and unstable aspects, and it is generally a question of which attribute outweighs the other, as they negotiate a shifting balance with one another.

The remainder of this thesis will examine various levels of stability and instability elsewhere in the String Trio. As indicated in the Introduction, this will be accomplished by first

studying how processes and formal structures combine to create certain passages of unmistakable stability (Chapter 2). These stable passages provide a context in which to understand the comparatively unstable passages that precede or follow them, and that will be discussed in Chapter 3.

## CHAPTER 2.

### FORMS OF STABILITY

The analysis of mm. 12-17 in Chapter 1 indicated some ways in which serial derivation generates stability in the String Trio. However, the extent to which the serial derivation of mm. 12-17 occurs is rarely matched in the rest of the Trio, and so textural elements, including metre, are used to create stability in other passages. The result is a heightened level of unity. The analyses in Chapter 2 will be limited to three passages: mm. 86-91, its recapitulation in mm. 263-266, and mm. 184-188. Each of these passages develop stable attributes within the context of a traditional genre: the waltz. These waltzes are not the only stable passages in the Trio, but they are certainly representative of the manner in which stable processes and structures appear elsewhere the piece.

#### Case 1a: A Waltz (mm. 86-91)

The passage that begins in m. 86 has several features that are characteristic of a waltz. This waltz is reproduced in Example 2.1 and it can be seen that, despite being notated in the compound duple metre of 6/8, the passage establishes the characteristic triple metre of a waltz, in this case as 3/8. The beaming of eighths and sixteenths clearly subdivides each measure of 6/8 into two groups of three eighth-note beats (with the eighth notes moving at an appropriate tempo). The significance of the internal subdivision of each bar into two 3/8 measures is twofold, since it also helps establish a waltz hypermetre. A waltz typically groups four measures of triple metre to create a quadruple hypermetre. Starting in m. 86, this waltz indeed groups four measures of 3/8, or two of the notated 6/8 measures. This assertion is supported by several pitch and rhythmic issues which will be discussed shortly. Also characteristic of a waltz is an

emphasis on afterbeats, for instance in the accompaniment figures played initially by the viola and cello in m. 86 (1 月 月 and 1 月 月).

**Example 2.1 – Measures 84-92**

Handwritten musical score for measures 84-92, featuring piano and cello parts. The score includes tempo markings (*poco rit.*, *a tempo*), dynamic markings (*p*, *spiccato*), and various fingerings and articulations. The piano part is in treble clef, and the cello part is in bass clef. The key signature is one flat (B-flat major/D minor). The score is divided into measures 84-87, 88-90, and 91-92. The piano part has a 6/8 time signature. The cello part has a 4/4 time signature. The score includes various annotations such as *Wg*, *Zg*, *W5*, and *Z5*, which likely refer to specific techniques or fingerings. The piano part has a 6/8 time signature. The cello part has a 4/4 time signature. The score includes various annotations such as *Wg*, *Zg*, *W5*, and *Z5*, which likely refer to specific techniques or fingerings.

The waltz melody of m. 86 is marked in relation to the surrounding music as one of the few legato ideas heard to this point in the String Trio. It is the first, moreover, that extends beyond the repetition of a single motive. Example 2.1 shows that the waltz melody is transferred between the instruments at regular time intervals: the melody begins in the violin in m. 86 and shifts to the viola in m. 88. The instrumental shifts in the melody mark units of two notated measures and thus establish the  $4 \times 3/8$  hypermetre. Each unit completes one statement of the waltz melody. The final statement of the melody in the cello becomes progressively more melismatic and is extended to three measures (mm. 90-92), thus disrupting the nearly established pattern of two-measure units and beginning the process of the waltz's dissolution.

The aforementioned grouping into two-measure units is confirmed by several factors, including the relationship of the viola melody in mm. 88-89 to the violin melody in mm. 86-87. The combined melody of mm. 86-89, and its interval structure, is reproduced in Example 2.2. Ordered pitch intervals (positive and negative) are indicated on the example.

#### Example 2.2 – Intervallic Content of Waltz Melody (mm. 86-90)

intervals   -4   -1   +16   -7   -1   +6   -11   +1   +6   -1   -7   +16   -1   -4

The pitch intervals reveal that the eight pitches of the viola melody are related to the violin melody by  $RI_1$ . The retrograde-inversional palindrome is exact in terms of pitch intervals, with one exception: the interval (+1) is used to start the viola line in place of the (-11) which concludes the violin's previous phrase. In addition to the interval palindrome, the viola's

durations in mm. 88-89 also retrograde the violin's from mm. 86-87 (with the exception of the grace note). The interval and duration palindromes therefore cast mm. 88-89 as closely derived from mm. 86-87, and enforce a clear antecedent-consequent relationship between the two phrases. As expected in a waltz, the antecedent and consequent each occur in the context of one quadruple hypermetric group, since each corresponds to four  $3/8$  measures.

The hexachords in this passage also reinforce the antecedent-consequent relationship between mm. 86-87 and mm. 88-89 and therefore provide another stabilizing factor in this waltz. Example 2.1 (above) labels the (012367) hexachords in mm. 86-92. Each measure of the melody contains a tetrachord [(0145) or (0167)] which combines with an (01) dyad in one accompanying instrument to complete the (012367) hexachord. The other accompanying instrument plays the (inverted) complementary ordered hexachord, and an aggregate thus occurs in every measure. In addition, Figure 2.1 shows that each hexachord in m. 86 is followed by a different ordering of its complement in m. 87.

**Figure 2.1 – Hexachords (mm. 86-89)**

Measure	86	87	88	89
Melody and Accompaniment 1	$W_8$	$z_8$	$RZ_8$	$Rw_8$
Accompaniment 2	$w_8$	$Z_8$	$Rz_8$	$RW_8$

Thus, within the antecedent statement of the melody (mm. 86-87) the aggregate has been stated twice vertically and twice horizontally. The consequent exchanges the placement of the hexachords. For example, the  $W_8$  and  $z_8$  pairing was divided between the violin and viola (melody and accompaniment 1) in mm. 86-87 but both hexachords are played, in retrograde, by

only the violin (second accompaniment voice) in the consequent. Similarly, the second accompanying voice in the antecedent, the cello, plays hexachords  $w_8$  and  $Z_8$  which are then played in retrograde by the viola melody and the first accompaniment voice (the cello) in mm. 88-89. As indicated in Figure 2.1, the consequent retrogrades the presentation of the hexachords. The resulting palindrome of hexachord orderings reinforces the relationship between the antecedent (mm. 86-87) and consequent (mm. 88-89).

The individual hexachords are arranged so as to project some significant pitch relationships in the antecedent phrase. One example is the melodic cadence in mm. 86-87. Figure 2.2 shows the relationship between the final “cadential” pitches of mm. 86 and 87. The violin descends from  $\langle A5-A\flat4 \rangle$  while an ascending semitone  $\langle E3-F3 \rangle$  is played simultaneously (though with a different rhythm) by the cello. The contrary motion created by the IC1 intervals is highly suggestive of a cadential formula and helps provide closure for the antecedent. At the same time, the inner voices both leap a minor third, again in contrary motion – viola  $\langle C4-E\flat4 \rangle$  and cello  $\langle C\sharp3-B\flat2 \rangle$  – to add to the symmetry which supports the cadence. The final sonority in m. 87 is a quartal chord, a sonority which often has a dominant function in Schoenberg’s music and is thus an appropriate kind of harmony for the end of an antecedent phrase.

A similar relationship is again heard in the consequent in mm. 88-89, but the aforementioned retrograde of hexachords means that the semitones occur between the first pitches in each measure, rather than the last. Their placement at the start of the bar negates the previous cadential effect but is a further indicator of the antecedent-consequent grouping because the use of a palindrome necessitates a return to the initial sonority of the waltz. Overall,

the serial derivation in mm. 86-89 clearly conforms to the structure of a waltz by establishing a traditional antecedent-consequent phrase group.

**Figure 2.2 – Pitch Cadence (mm. 86-87)**



The next division within the passage occurs in m. 90 where the melody shifts to the cello and opens with a motive that has the same contour and rhythm (including the distinctive grace note) as the violin in m. 86 (see Example 2.1 above). The similarity in motives suggests the beginning of a new antecedent-consequent period, implying that m. 90 is the start of a second phrase group. The hexachords indicated on Example 2.1 show that m. 90 begins with the  $RZ_8/Rz_8$  hexachord pair and is followed by the  $RW_8/Rw_8$  pair in m. 91. These are the same ordered hexachords that were used in the first phrase group, but their placement has been reversed to correspond to the hexachords in mm. 88-89. As a result, the pitches and intervals of the opening motive in m. 90 are not the same as m. 86. However, the division of the hexachords between instruments serves to reinforce the assumption that m. 90 initiates a second phrase group that is parallel to the phrase beginning in m. 86.

Table 2.1 notates the three motives of the waltz according to their order-number contents since the rhythmic motives which set these order-number motives are varied throughout the passage. The table also indicates the instrument associated with the specified order numbers in each phrase. (In addition, the order numbers are notated on the score in Example 2.1). This table reveals that motive **A** is characterized by playing order numbers  $\langle 0,1,3,5 \rangle$  from the hexachord in use at that time and motive **B** completes the hexachord with order numbers  $\langle 2,4 \rangle$ . Motive **C** plays all order numbers of the complementary hexachord. Table 2.1 provides additional support for the phrase analysis suggested above by showing precisely how the order numbers are linked to the phrase structure of the passage. The start of the consequent phrase in m. 88 is indicated by a shift to the “retrograde” of the order numbers associated with each motive.<sup>13</sup> When the second phrase group begins in m. 90 the order numbers are  $I_5$  of the order numbers from mm. 86-87.

**Table 2.1 – Order Number Motives (mm. 86-91)**

Motive	Antecedent (mm. 86-87)	Consequent (mm. 88-89)	Antecedent (mm. 90-91)
<b>A</b>	violin: $W_8 \langle 0,1,3,5 \rangle$ , $z_8 \langle 0,1,3,5 \rangle$	viola: $Rz_8 \langle 5,3,1,0 \rangle$ , $RW_8 \langle 5,3,1,0 \rangle$	cello: $Rz_8 \langle 5,4,2,0 \rangle$ $RW_8 \langle 5,4,2,0 \rangle$
<b>B</b>	viola: $W_8 \langle 2,4 \rangle$ $z_8 \langle 2,4 \rangle$	cello: $Rz_8 \langle 4,2 \rangle$ , $RW_8 \langle 4,2 \rangle$	viola: $Rz_8 \langle 3,1 \rangle$ $RW_8 \langle 3,1 \rangle$
<b>C</b>	cello: $w_8 \langle 0,1,2,3,4,5 \rangle$ $Z_8 \langle 0,1,2,3,4,5 \rangle$	violin: $RZ_8 \langle 5,4,3,2,1,0 \rangle$ $Rz_8 \langle 5,4,3,2,1,0 \rangle$	violin: $RZ_8 \langle 5,4,3,2,1,0 \rangle$ $Rw_8 \langle 5,4,3,2,1,0 \rangle$

<sup>13</sup>In mm. 88-89 references to  $RZ_8 \langle 5,3,1,0 \rangle$  means the same as  $Z_8 \langle 5,3,1,0 \rangle$ . The redundancy in labeling is intended to maintain consistency between the labeling of hexachords throughout the paper. Thus, regardless of context, “R” is always used when a hexachord is played in retrograde.

Despite the aforementioned variations in rhythm, there are nonetheless characteristic rhythmic features associated with each motive. Motive **A** features a dotted rhythm and motives **B** and **C** are characterized by traditional waltz accompaniments of sixteenth-note groupings. The motives are distinct enough to enable an analysis of each rhythmic figure as it is repeated, or changed, throughout the passage. Example 2.3 reproduces the waltz and labels each occurrence of the order number motive as belonging to a specific rhythmic motive. Motives **A** and **C** consist of two rhythmic sub-figures which are distinguished by upper and lower case letters (eg. *A/a* and *C/c*). In order to indicate the progression of each rhythmic figure throughout the passage, several notational devices are employed. The first occurrence of a motive, or rhythmic sub-figure, is numbered (*i.e.*  $A_1$  and  $a_1$ ). Any rhythmic figures that are clearly related to the original, but are varied, are numbered in chronological order ( $A_2/a_2$  in m. 87). When a rhythmic figure is restated, its relationship to the original is indicated by the use of the same label. (Several other labels are utilized in Example 2.3, the significance of which will become apparent in the analysis of the rhythmic figures: a plus sign (+) indicates an agogic accent on beat 2, an asterisk (\*) marks an agogic accent on the second sixteenth of beat 1, a minus sign (-) is an onset on beat 2, and an *x* indicates an onset on the second sixteenth of beat 1. All beats are considered within the context of a 3/8 measure.)

$A_2$ , the second statement of figure *A*, places a sixteenth rest on the downbeat of m. 87. The first note is shortened to a sixteenth but the remaining durations are unchanged. In m. 88 the *A* figure is placed in the second half of the measure and is the duration retrograde of  $A_2$  (labeled  $RA_2$  on Example 2.3) so the sixteenth rest occurs after the three-note figure, rather than before, and the placement of the motive is shifted. The durational palindrome that was noted

Example 2.3 – Rhythmic Sub-Figures (mm. 86-92)

$A_1$     $a_1$     $A_2$     $a_2$

*a tempo* ( $\text{♩} = 54$ )

$P$  +   +   +   +

$B_1$  -    $B_2$  +

$C_1$  -    $C_1$  +    $C_1$  -    $C_2$

88  $C_1$  -    $C_1$     $C_4$     $C_5$

$R_{a2}$  *spiccato*    $R_{a2}$     $a_1$     $R_{a1}$     $B_3$

$P$    \*   \*    $f$    +

$B_1$  -    $B_2$  +    $pA_1$     $a_1$

91  $C_6$

$B_4$  *spiccato*    $a_2$     $a_2$     $\mu$

above is completed with the retrograde of  $A_1$ . This analysis reveals that changes in the initial statements of the motive are subtle, typically involving only the placement of a sixteenth note or rest, but the variations result from the aforementioned duration palindrome which reinforces the antecedent-consequent grouping of mm. 86-89. However, one hears the duration palindrome less than the rhythmic and agogic variation it provides.

The cello line returns to the durations of  $A_1$  in m. 90, thus clarifying the role of this measure as the start of a second phrase group which one expects will be parallel to the phrase group begun in m. 86. In mm. 91-92, sub-figure  $A$  is varied greatly with the addition of three sixteenth notes which results in the diminution of the figure from eighth to sixteenth notes. These final two statements of  $A$  are the most varied of the passage and do not parallel the changes of the motive that occurred in the first phrase group which suggests that the second phrase group will not continue to reinforce its relationship with mm. 86-89.

The rhythmic sub-figure which comprises the second half of motive **A** also undergoes variation. Initially a grace note and dotted quarter note,  $a_1$  is characterized by two attacks. The grace note is changed to an eighth note in  $a_2$ , thus decreasing the dotted quarter note to a quarter note in m. 87. The durations of  $a_2$  are reversed in m. 88 as indicated by the label  $Ra_2$ . The dotted quarter note of  $a_1$ , without the grace note, returns in m. 89. The relationship between m. 86 and m. 90 is reinforced by the return of sub-figure  $a_1$  in m. 90. However, mm. 91-92 repeat  $a_2$  and thus disrupt the pattern established in mm. 86-89, giving another indication of the impending breakdown of the waltz. Even so, the continued use of one of the waltz's rhythmic figures indicates that elements of the waltz persist despite the variations.

The accompaniment's rhythmic figures in the waltz are treated similarly. Motive **B** first occurs in the viola and has two components:  $B_1$  and  $B_2$ .  $B_1$ , consisting of four sixteenth notes and

a dotted-quarter note, is stated twice in the waltz (mm. 86 and 88). The eighth rest on the downbeat of mm. 86 and 88 means that there is an attack on the second beat of the measure. Sixteenth notes also begin  $B_2$  (m. 87, viola and m. 89, cello) but both figures are shifted to begin on the downbeat. Similar to the development of motive **A**, significant variation occurs in the second phrase group. In m. 90, the rhythm of motive **B** is changed to five sixteenth notes and the dotted quarter note that occurred in the second half of mm. 86-89 is replaced by two sixteenth notes and a quarter note. In m. 91, the motive is varied further with the quarter note of m. 90 changed to a dotted eighth and sixteenth figure which results in a strong similarity to the dotted rhythm of motive  $A_1$ . The order numbers of motive **B**, <2,4>, occur in the violin in m. 92 but there are no similarities in rhythm.

Motive **C** recurs throughout the passage, with minimal variation, and consists of two sub-figures ( $C_1$  and  $c_1$ ). In mm. 86-88 the motive groups all pitches of the complementary hexachord into dyads.  $C_1$  is stated unaltered in mm. 86-88 and the only variation in  $c$  occurs in m. 87 when the  $\text{♩} \text{♩}$  figure is replaced by a dotted quarter note. The use of a dotted quarter note means that only one instrument, the violin, has any motion during beat 2 of m. 87, whereas during beat 2 of m. 86 only the cello is active. In mm. 86-88 both sub-figures of motive **C** consistently begin on the second eighth of each dotted quarter-note beat (with the exception of m. 87b). In m. 89, when **C** changes from two sub-figures to one, the motive shifts to the violin and occurs a sixteenth early, resulting in an onset attack on the second sixteenth of beat one. Significantly, the onset of motive **C** occurs at different locations in each of mm. 89-91, which serves to decrease the metric stability of the passage and points to the eventual break down of the waltz.

The agogic and onset accents of these measures are also notated on Example 2.3 (see the description of analytical markings above) revealing several significant characteristics of the

waltz. In m. 86a and m. 87a all instruments have either an agogic or onset accent on the second beat of 3/8. This stress on the second beat is a waltz characteristic and thus should not be construed as an element of instability (*i.e.* as articulating a “shifted” dotted quarter-note pulse stream). There is also an onset accent on the second eighth in the cello in m. 86b and the violin has an agogic accent on the second eighth of m. 87b. These accents are heard as afterbeats to the emphasis of the first eighth in mm. 86b and 87b which result from dotted quarter notes in the violin and viola (m. 86b) and the viola and cello (m. 87b). Thus the early measures of the waltz clearly project the triple metre by accenting the first beat of every 3/8 measure but the topic of the waltz is maintained by the emphasis of the second eighth of each dotted quarter-note span.

As the passage continues there is less systematic emphasis on the beats and subbeats. The first change in m. 88a is that only the violin and cello accent the second beat of the bar and the viola emphasizes the first beat. In addition, accents on the second sixteenth of beats begin to occur in m. 88b, suggesting a shift to anticipating the second beat (also common in a waltz) as opposed to accenting it. As the passage continues it becomes rarer for accents to line up. For example, in m. 89 the cello has an agogic accent on beat two while the violin line enters on the second sixteenth of beat 1. This irregular placement of attacks in mm. 88-89 points to the eventual breakdown of the waltz because of the apparent inability to maintain a steady pattern of accented beats. It is significant that the palindrome of durations, already discussed as one of the key generators of stability in this passage, contributes to the developing metric instability. This is because the reversal of some rhythmic figures results in the accent of off-beats.

It has already been suggested that rhythmic variation leads to a breakdown of the waltz. The actual dissolution of this waltz will be discussed in Chapter 3, but the elements that initiate it will be introduced here. Since all features of m. 90 point to it as the start of a new phrase

group, then the antecedent should close at the end of m. 91. The closure of the first phrase in m. 87 was shown (in Figure 2.2) to result from a semitone cadential motion in the voice leading and by extended durations in all instruments at the end of the measure. In what should be the parallel moment in m. 91 there is no semitone relationship and there is an increase in the rhythmic activity at the conclusion of the bar.

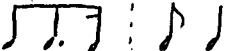
More significant than the lack of closure to the antecedent in m. 91, however, is that the expected consequent phrase does not begin in m. 92 which is first indicated by a change in the transposition level of the hexachords to  $W_5$  and  $z_5$ . The violin plays a dyad of order numbers  $\langle 2,4 \rangle$ , previously associated with motive **B**, from each hexachord but the rhythm holds no similarities to that motive. In addition the viola line drops out completely and the diminution of motive **A** means that the melody of the waltz is obscured. The eventual break-down of the waltz should not in any manner diminish the effect that m. 90 has in initiating a second phrase group. Rather, as the phrase progresses we are gradually made aware that it will not achieve the conclusion implied by its initial parallelism with mm. 86-89. Thus, while the stability of the first phrase group is unquestionable, the second phrase group of the waltz is denied closure. The way in which it “liquidates” the preceding formal stability will be discussed later, in Chapter 3.

#### Case 1b: The Waltz Recapitulated (mm. 263-266)

The second passage to be considered in this chapter is the recapitulation, in mm. 263-266, of the waltz from m. 86. Measures 263-266 are reproduced in Example 2.4. A thorough analysis of the recapitulation and its significance in the String Trio is beyond the scope of the present discussion but the analysis of several passages (in this chapter and Chapter 3) will focus on the individual properties of a recapitulated passage and its relationship to the original.

# Example 2.4 – Measures 263-272

The musical score consists of two systems. The first system covers measures 263 to 266. Measure 263 is marked with a 'W8' and '(A tempo)'. The violin part has a 'spiccato' marking. The cello part has a 'pizz' marking. Both parts have fingerings indicated by numbers 0-5. The second system covers measures 267 to 272. Measure 267 is marked with a 'W8' and '5'. The violin part has a 'pizz' marking. The cello part has a 'pizz' marking. Both parts have fingerings indicated by numbers 0-5. The score includes various musical notations such as notes, rests, and dynamic markings like 'p' and 'cresc.'.

The cello melody in m. 263 has the same dotted-note rhythmic motive as the violin from m. 86 and is the first indication of the relationship between the two passages. The recapitulated waltz again projects the quadruple waltz hypermetre as two 6/8 units ( $4 \times 3/8$ ) which are delineated by the melody: first in the cello (mm. 263-264), then in the violin (mm. 265-266). The waltz hypermetre is created by the internal subdivision of each 6/8 measure into two 3/8 measures just as in mm. 86 ff. The 3/8 measures are often distinguished by changes in the musical figures (e.g.  in the cello line, m. 263). In addition, the hexachords

notated on the score in Example 2.4 reveal that the transposition level is the same as mm. 86-91 (refer to Example 2.1 for comparison).

The division of the hexachords between instruments is indicated by the notation of the order numbers on Example 2.4. The order numbers reveal another similarity to the waltz of m. 86 which is outlined in Table 2.2: the (012367) hexachords are divided between the instruments in the same way in both passages. The hexachords of the consequent phrase are again retrograded in order to distinguish it from the antecedent and to clearly mark its beginning.

**Table 2.2 – Order Number Motives (mm. 263-266)**

Motive	Antecedent (mm. 263-264)	Consequent (mm. 265-266)
<b>A</b>	cello: $w_8 \langle 0,1,3,5 \rangle$ , $Z_8 \langle 0,1,3,5 \rangle$	violin: $Rz_8 \langle 5,3,1,0 \rangle$ , $RW_8 \langle 5,3,1,0 \rangle$
<b>B</b>	viola: $w_8 \langle 2,4 \rangle$ , $Z_8 \langle 2,4 \rangle$	cello: $Rz_8 \langle 4,2 \rangle$ , $RW_8 \langle 4,2 \rangle$
<b>C</b>	violin: $W_8 \langle 0,1,2,3,4,5 \rangle$ $z_8 \langle 0,1,2,3,4,5 \rangle$	viola: $RZ_8 \langle 5,4,3,2,1,0 \rangle$ $Rw_8 \langle 5,4,3,2,1,0 \rangle$

Despite these similarities, the recapitulated passage is not a pitch repetition of the original waltz. The changes occur because the pitches of a motive are derived from the hexachord that is the complementary inversion of the one used in the initial passage. For example, in m. 86 the violin melody plays order numbers  $\langle 0,1,3,5 \rangle$  from the hexachord  $W_8$  which results in the pitches  $\langle B\flat, G\flat, F, A \rangle$ . In m. 263, the cello plays the same order numbers  $\langle 0,1,3,5 \rangle$  but the pitches  $\langle E\flat, G, A\flat, E \rangle$  are derived from the hexachord  $w_8$  (the complement of  $W_8$  in the original passage) with the result that the melody of the recapitulated waltz is related to the original waltz by  $I_1$ . Because mm. 86-89 were constructed as an  $RI_1$  palindrome the recapitulation's melody is therefore also a retrograde of the 'original' waltz melody. Thus,

Schoenberg creates strong serial connections between the passages without repeating pitch series in the voices.

Due to the relationship just observed between the original and recapitulated waltz melodies, the interval content of the melody in mm. 263-266 (reproduced in Example 2.5) again reveals a palindrome, with the halves of the melody related by  $I_1$ . As in the waltz from m. 86, the only change in the palindrome is that the (+11) at the end of m. 264 is changed to (-1) at the start of m. 265. This clearly continues the strict serial structuring of mm. 86-89 (refer to Example 2.2) where the palindrome was also a significant structural feature of the melody. The presence of a palindrome suggests that the recapitulation of the waltz is also a phrase group; the antecedent is in mm. 263-264 and the consequent in mm. 265-266. Thus, the recapitulated version of the waltz maintains the same level of serial and formal stability as the original passage.

#### Example 2.5 – Intervallic Content of Waltz Melody (mm. 263-266)

m. 263

intervals    +4   +1   -16    +7   +1   -6   +11       -1       -6   +1       +7   -16   +1   +4

Though the recapitulation maintains much in common with the serial structure of the waltz from m. 86 there are significant changes in the rhythmic figures. In fact, only the rhythm associated with the order-number motive A is similar in both passages and therefore references to individual motives in the original waltz will be restricted to comparisons involving motive A.

As in the initial waltz the rhythmic figures are varied throughout the passage. Example 2.6 labels the occurrence of each motive in mm. 263-266, dividing motive A into two rhythmic sub-figures  $A_1$  and  $a_1$ , and notates agogic and onset accents as before. The figures are numbered according to their chronological order of appearance.

**Example 2.6 – Rhythmic Sub-Figures (mm. 263-266)**

The musical score for Example 2.6 spans measures 263 to 266. It is written for Violin, Cello, and Bass. The key signature has one flat (B-flat). The time signature is 3/4. The score includes various rhythmic and dynamic markings. Motive A is divided into sub-figures  $A_1$  and  $a_1$ . Other motives labeled include  $C_1$ ,  $C_2$ ,  $C_3$ ,  $C_4$ ,  $B_1$ ,  $B_2$ ,  $B_3$ ,  $B_4$ ,  $R_{a_1}$ , and  $A_3$ . The score includes tempo markings like '(A tempo)' and performance instructions like 'spiccato'. Handwritten annotations include 'X', 'Y', and 'L'.

Motive A begins in the cello and its dotted rhythm in m. 263 is the only clear indication of the waltz's recapitulation.  $A_2$  eliminates the first sixteenth of  $A_1$  but maintains the agogic accent on beat 2, which is the same as the violin line in mm. 86-87.  $A_3$  is altered extensively

(compared to  $A_2$ ) by adding a sixteenth note to the first duration and removing a sixteenth from the second duration. The remaining eighth is divided into a sixteenth note, a 32<sup>nd</sup> rest, and a 32<sup>nd</sup> note. The final statement,  $A_4$ , which occurs in m. 266b, is similar to  $A_2$  but shifts the figure one sixteenth earlier, resulting in an agogic accent on the second sixteenth of beat 2. Thus, after clearly establishing that mm. 263-266 are a recapitulation of the waltz from m. 86, the passage – and particularly the consequent phrase – proceeds in a different manner than the original.

The differences between the two passages are reinforced by the progression of the second sub-figure of motive A. The initial statement,  $a_1$ , has two attacks with an agogic accent created by the quarter note on the second beat. The eighth note duration becomes a grace note in  $a_2$ . These rhythmic figures are the same as the waltz from mm. 86 and 87 but their presentation is reversed. The third statement,  $a_3$ , reverses the elements of  $a_1$  so that the agogic accent occurs on beat 1.

The variations of the rhythmic figures within the passage mean that the durational palindrome, which supported the retrograde-inversional palindrome in the original melody, does not materialize in the recapitulation. The durational palindrome was one of the unifying features of the m. 86 waltz because it added yet another element of stability which supported the antecedent-consequent grouping. Therefore the seemingly less systematic approach to variation in the recapitulation of the waltz may suggest that the antecedent-consequent relationship is not as strongly reinforced in the recapitulation. However, further analysis reveals that a correlation between the phrases does occur. Figures  $a_1$  and  $a_3$  are the only instances in the melody where an eighth and quarter note are paired. In addition  $A_3$  is clearly a variation of  $A_1$ . Thus there is a relationship between the rhythmic figures of the first and third measures of the waltz, suggesting that the consequent which starts in m. 265 is rhythmically similar to the antecedent of m. 263.

The relationship is further clarified by the similarities between mm. 264 and 266. Both measures feature a dotted quarter note, though  $a_2$  has the additional grace note. Figure  $A_4$  is also closely related to  $A_2$ . Both figures begin with the same opening rhythm (sixteenth-dotted eighth), with  $A_4$  slightly varied because it occurs a sixteenth earlier which lengthens the final duration in m. 266. In the consequent phrase the placement of rhythmic figures in each measure are reversed but Example 2.6 indicates the similarities between the phrases. Measures 263 and 265, which have similarities in rhythmic structure are labelled 'X'. The remaining measures, related to one another and distinct from mm. 263 and 265, are labelled 'Y'. This notation reveals that the rhythmic structure of the waltz melody results in a grouping of XY-XY which provides additional support for the antecedent-consequent phrase group. Thus, in the recapitulation of the waltz from m. 86, there are two kinds of symmetry at work. The first is the palindrome of intervals and hexachords that has its mid-point between mm. 264-265. In addition, the variation of the rhythmic figures in mm. 263-266 results in a symmetry that is often anticipated in the organization of a parallel periodic structure. This superimposition of two kinds of symmetry reveals the extent to which the recapitulated waltz has been developed from the original.

Motive **B** undergoes significant variation, encompassing a process of decreasing attack density, which results in an augmentation of the motive's durations.  $B_1$  has a steady pattern of sixteenth notes. The dotted eighth note on the downbeat of m. 264 means that  $B_2$  begins three sixteenths earlier than  $B_1$  and though the number of attacks has only decreased to six (from eight), some of the durations in the figure are lengthened. The general decrease in attack density continues in  $B_3$  when the motive shifts to the cello in m. 265 and has only four pitch attacks. The final statement is reduced to one dotted quarter note in m. 266. Though not a systematic progression, the changes of motive **B** do incorporate a general lengthening of durations which

contributes to a sense of decelerative closure in the passage, an idea that will be discussed further below.

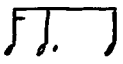
Motive **C** is characterized by off-beat attacks on the second sixteenth of beat one in mm. 263a, and 264a. In m. 265 the motive shifts from double stops to a single line of pitches and groups the pitches into segments that also begin on the second sixteenth of beat one. The final statement of **C** changes from steady sixteenths to a syncopated figure. The only characteristic that is common to all statements of motive **C** in mm. 263-266 is the emphasis on off-beats.

By emphasizing off-beats, motive **C** creates rhythmic instability in the recapitulation of the waltz. The accents labelled on Example 2.6 reveal that the only time that all instruments have a simultaneous accent is on the second eighth of m. 263b. Elsewhere, agogic and onset accents in different instruments occur close together but are slightly offset. Measure 264 provides an example of this irregularity: the viola has agogic accent on beat 1, the violin motive begins on the second sixteenth of beat one, and the cello has an agogic accent on the second eighth. Despite this staggering of accents, which occurs throughout the passage, the second eighth of  $3/8$  is still emphasized either by way of a direct accent on the beat, or by anticipation of the beat with an attack on the preceding sixteenth. A similar effect also occurs in m. 263 when the cello has an agogic accent on the second eighth while the violin anticipates it with an onset accent on the second sixteenth of beat 1. Because the attacks rarely coincide in mm. 263-266, the recapitulated waltz does not exhibit the same level of metric stability as the original waltz, but the emphasis on the second eighth in each dotted quarter-note span, by way of anticipation or direct attack, does clearly project the waltz rhythm and its metre.

Following the completion of the phrase group in m. 266, a contrasting musical idea is introduced. This contrast differs from the original waltz passage because the attempted second

phrase group is not recapitulated and neither is the gradual break-down of the waltz (which will be discussed in Chapter 3). Instead, the music of m. 267 has little in common with the waltz theme. The metre shifts from 6/8 to 2/4; it is still duple, but it lacks the waltz's triple subdivision, and there are no motivic remnants of the waltz in the music following m. 267. The introduction of new material in m. 267, while clearly indicating that the waltz has reached a conclusion, does not necessarily provide closure. Thus, considering the dissolution of the original waltz, it is necessary to determine if the recapitulated waltz indeed achieves closure.

There are several elements which suggest closure in m. 266. First, the cello line reaches a point of relative stasis when the aforementioned augmentation of durations in motive **B** comes to a rest in m. 266 and the viola concludes with the longest duration of its line. Both instruments accent the second beat of m. 266, either agogically or by onset, and thus continue to emphasize the second beat as is expected in a waltz. The strongest argument for closure in this passage is the completion of the pitch palindrome in the violin line that was shown above in Example 2.5. The conclusion of the melody also marks the end of the retrograde of the original waltz melody in mm. 86-89.

The rhythmic figures of the violin line, however, imply a continuation. Measure 266 closes with the  of motive **A** which in the preceding measures, and in the waltz of m. 86, was always followed by a continuation of the melody. This same rhythmic figure occurred in the parallel measure of the first statement of this waltz (m. 89) and served to push the music to the downbeat of m. 90 (which marked the start of the second phrase group). The waltz in mm. 263-266 is a completed phrase group but the rising line of the violin in m. 266 suggests a continuation of the established musical idea. Instead, a passage of contrast is introduced which promptly eradicates the characteristic features of the waltz. Therefore, while closure is implied

and is achieved, in some manner, it is still undermined by the blunt juxtaposition with contrasting material.

It was shown previously in this chapter that the first phrase of the waltz of m. 86 is carefully structured both serially and texturally. In contrast, the second phrase group initiates instability which leads to the breakdown of the waltz. Since only the first phrase group, and not the eventual dissolution of the waltz, is recapitulated in mm. 263-266, it seems likely that the recapitulation should be able to achieve the closure denied the original waltz. However the preceding analysis has shown that variation within the recapitulation of the waltz means that mm. 263-266 differ from the original. These changes do not necessarily entail an increase in instability because, despite the variations of rhythms in mm. 263-266, the passage still clearly establishes a triple metre in the context of a quadruple hypermetre. The irregularity of accents does undermine the expected emphasis on traditional downbeats but this was previously acknowledged to be common in the waltz genre. Serially, the recapitulated passage is equal in stability to the original waltz and is organized in such a manner as to clearly relate the two passages without resorting to an exact repetition of pitch series. Thus, while clearly a recapitulation of the earlier waltz, from m. 86, mm. 263-266 present the waltz theme in a new context which distinguishes the recapitulation from the original.

#### Case 2: Another Waltz (mm. 184-188)

The third passage to be analyzed in this chapter occurs in mm. 184-188. The following analysis will show that while there are some significant differences, the formal structure of mm. 184-188 is similar to the waltzes already discussed. The (012367) hexachords are notated on the score in Example 2.7 revealing that the transposition is the same as the waltz from m. 86.

## Example 2.7 – Measures 182-188

182 *quasi trill* *fp* *pp ponticello* *p* *W<sub>8</sub>* *P* *0 2 3* *J. = 60* *12* *8* *1* *4 5* *0 2 3 1 4* *p dolce*

185 *28* *0 2 3* *1* *4 5* *5* *0 2 3 1 4* *W<sub>8</sub>* *0 2 3 1 4 5* *4* *1* *0* *5 3* *pp* *5* *P* *5* *3* *2* *Z<sub>8</sub>* *p*

187 *W<sub>8</sub>* *2 4 10 4 1 0* *5 3 2 4 10* *sempre ppp and without accentuations* *ppp* *(A)* *ppp* *ppp* *W<sub>8</sub>* *5 3 2* *Z<sub>8</sub>* *5 3 2 4 10* *W<sub>8</sub>* *4 1 0*

The pairing of hexachords into aggregates is shown in Figure 2.3. In mm. 186-187 the complementary hexachords  $Z_8$  and  $w_8$  are twice paired in counterpoint to form aggregates within each measure. In addition, the violin and cello lines (melody and accompanying voice 1) complete an aggregate in mm. 186-187. At the same time, the viola (accompaniment 2) also completes an aggregate with the same hexachords. Thus, the analysis of hexachords reveals serial stability which indicates a level of uniformity in the waltz.

**Figure 2.3 – Hexachords (mm. 184-188)**


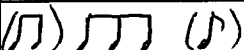

Measure	184	185	186	187
Melody and Accompaniment 1	$W_8$	$z_8$	$Z_8$	$w_8$
Accompaniment 2	$W_8$	$z_8$	$w_8$	$Z_8$

However, this waltz is anomalous for the String Trio because, as indicated on Example 2.7, the previously established orderings of the hexachord are not strictly maintained. In order to best discuss the relative ‘disorder’ of these hexachords it is necessary to analyze the motives of this passage. Table 2.3 shows the three rhythmic motives upon which mm. 184-188 are based. The parentheses around several of the durations of motives **B** and **C** indicate that these durations are sometimes varied or omitted (which will be discussed at the appropriate time).

The table indicates that each rhythmic motive is characterized by its derivation from the hexachord and is associated with a motive of order numbers. Motive **A** utilizes order numbers  $\langle 0,2,3 \rangle$  or its order-number “inversion” (sum 5)  $\langle 5,3,2 \rangle$  from the relevant hexachord. The eighth-note figure of motive **B** is based on order numbers  $\langle 1,4,5 \rangle$  or the “inversion”  $\langle 4,1,0 \rangle$ .

The ordering of motive **C** is the anomaly in this passage. To this point in the String Trio the (012367) hexachord has been presented in one of the four orderings outlined in the Introduction, yet on Example 2.7 motive **C** has been labeled  $W_8$  which results in the ordering  $\langle 0,2,3,1,4,5 \rangle$  or its inversion  $\langle 5,3,2,4,1,0 \rangle$ . Despite the irregularity, different orderings of the hexachord do not resolve the ‘disorder’ because they result in an apparently random placement of order numbers (for example  $Z_8$  would require the order numbers  $\langle 4,0,5,3,1,2 \rangle$ ) and thus  $W_8$  remains the best option. The  $W_8$  hexachord results in the rearrangement of only one order number but this slight change, while seemingly insignificant, serves two functions. First, motive **C** can be understood to be derived from the consecutive pairing of motives **A** =  $\langle 0,2,3 \rangle$  and **B** =  $\langle 1,4,5 \rangle$ . The result is suggestive of imitative counterpoint, which anticipates the predominant role that counterpoint will have later in the passage. In addition, the reordered hexachord is a characteristic of this passage and it will be shown in Chapter 3 that the altered ordering is used in later measures to refer to this waltz.

**Table 2.3 – Motives (mm. 184-188)**

Motive	Rhythmic Motive	Order Numbers mm. 184-185	Order Numbers mm. 186-188
<b>A</b>		violin: $W_8 \langle 0,2,3 \rangle$ , $z_8 \langle 0,2,3 \rangle$	cello: $Z_8 \langle 5,3,2 \rangle$ , $w_8 \langle 5,3,2 \rangle$
<b>B</b>		viola: $W_8 \langle 1,4,5 \rangle$ , $z_8 \langle 1,4,5 \rangle$	violin: $Z_8 \langle 4,1,0 \rangle$ , $w_8 \langle 4,1,0 \rangle$
<b>C</b>		cello: $W_8 \langle 0,2,3,1,4,5 \rangle$ , $z_8 \langle 0,2,3,1,4,5 \rangle$	viola: $w_8 \langle 5,3,2,4,1,0 \rangle$ $Z_8 \langle 5,3,2,4,1,0 \rangle$

The imitative counterpoint suggested in relation to the reordering of the hexachord is not only present in the derivation of motive **C**. Similarities between motives **B** and **C** also suggest imitation. For example, in m. 184 both the viola (motive **B**) and cello (motive **C**) emphasize the

pitch class  $G\flat$  by repetition. The relationship is obscured somewhat because the cello's  $G\flat$ 's are played as sixteenth notes, a diminution of the viola's eighth notes, and occur in the midst of motive **C**. In addition, each motive clearly emphasizes the last pitch-class of the hexachord: the viola repeats the final  $A4$  (mm. 184-185) and the cello delays the arrival of  $A3$  until immediately before the return of motive **A** (m. 185). These similarities in presentation continue throughout the passage and reveal that there are further elements of imitative writing in the waltz.

Prior to continuing with an analysis of the motives in mm. 184-188, it is necessary to observe some of the large-scale metric issues that shape this passage. Michael Cherlin also refers to this passage as a waltz and places it in the context of a triple metre by suggesting that mm. 184-188 represent a  $9/8$  metre that is expanded to  $12/8$  by the accompanying voices.<sup>14</sup> Measures 184-188 do have the characteristics of a waltz but it is not necessary to superimpose a triple metre, as Cherlin has done, since one is already present. The distinctive attribute of a  $12/8$  metre is that it subdivides into four groups of three eighth notes just as the waltz typically involves a hypermetre that groups four measures of a triple metre (which in this case is  $3/8$ ). Motive **B**, which is played first by the viola, clearly projects this subdivision into three eighth notes. The cello's motive **C**, though consisting of sixteenth notes, also supports the subdivision into  $3/8$  by emphasizing the start of each eighth beat with a leap or repetition of a pitch. Finally, motive **A** clearly reflects the quadruple hypermetre by playing only dotted-quarter-note durations.

Viewing mm. 184-188 in this manner means that ascribing the characteristic triple metre of a waltz to this passage is straightforward. A more difficult (hyper) metric issue relates to the

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<sup>14</sup>Cherlin, "Memory and Rhetorical Trope," 591 n.55.

notated metric alignment. As written, the 12/8 metre is not clearly projected, in part because the rest on the downbeat of m. 184 causes the first pitch of the violin motive to be heard as a downbeat. In addition, the moment of greatest attack density in mm. 184-185 occurs on beat four of each measure. Cherlin's solution of viewing each measure as 9/8 expanded to 12/8 does not adequately account for this irregular placement of emphasized beats. To resolve the imbalance, Figure 2.4 suggests a scansion which considers the violin's first pitch in m. 184 to be a new (hyper) beat 1.

**Figure 2.4 – Alternate Scansion: mm. 184-188**

The figure displays a musical score for measures 184 through 188, illustrating an alternate scansion. The score is written for three staves: Treble, Alto, and Bass. The time signature is 12/8. The notation includes various musical symbols such as notes, rests, and accidentals. The scansion is indicated by vertical dashed lines and labels: B1, B2, B3, B4, B5, B6 for hyperbeats and C1, C2, C3, C4, C5, C6 for counterbeats. The measures are labeled 184a, 185a, 186a, 187a, and 188a. The score shows a complex rhythmic structure with multiple accents and a change in meter from 12/8 to 9/8 in measure 186.

In the figure the notated barlines are indicated with a dotted line and the barlines in the proposed alignment are indicated by a solid line. The measures are numbered to indicate their relation to the original barring so that m. 184a begins on the second beat of the notated m. 184 and continues into m. 185. Thus the start of the theme, motive **A**, is numbered 184a. In the proposed alignment every motive is completed once in each of measures 184a and 185a and twice in each of measures 186a and 187a. After each motive has been stated in its entirety, it begins again, indicating the start of a new measure. Therefore, the conclusion, and start, of each measure is clearly indicated by grouping parallelisms. In mm. 184a-185a the groups are characterized by the staggered entries of each instrument. The cello in particular supports, and reacts to, the violin's lead by restating (in diminution) the pitches of the violin line. These staggered entries are continued throughout the passage, but are obscured by the additional statements of motives **B** and **C** which coincide with the onset of motive **A**.<sup>15</sup>

The violin is the only instrument to play on the downbeat in the first two (hyper) measures of the waltz (mm. 184a-185a) and (hyper) beat three is emphasized by the entrance of the cello. In mm. 186a - 187a there are additional statements of motives **B** and **C** that start on (hyper) beat 1. This stress on beats one and three reinforces the quadruple hypermetre and forges an additional link with the waltz passage that began in m. 86. The 6/8 metre of that passage, which was subdivided into two 3/8 measures, resulted in a quadruple hypermetre subdivided into a pair of two-measure units. With the first and third (hyper) beats accented throughout the waltz, each 12/8 grouping is subdivided into two 6/8 groups.

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<sup>15</sup> An alternate scansion of this passage is possible by viewing beat 4 in m. 184 as the downbeat of the new alignment, with the preceding three beats functioning as an extended anacrusis. The appeal of this alignment is that it recognizes the moment of greatest attack density, and thus the strongest emphasis, as the downbeat of the measure. However, this approach does not acknowledge the grouping parallelisms of the passage.

The motivic analysis in Table 2.3, to which we now return, indicates that the division of the hexachord between voices is consistent throughout the passage. The following analysis of the progression of each motive will be considered in the context of the suggested metric scansion in Figure 2.4. After beginning in the violin, motive **A** is played again by the violin in m. 185a and then shifts to the cello in m. 186a for two more statements. The inversion of order numbers occurs in mm. 186a-187a when the cello continues the motive. Motive **A** is the only motive that is not altered rhythmically or metrically (*i.e.* the motive's placement in the measure is not changed) and it thus provides a sense of stability to the passage.

Motive **B** does undergo some variation in the passage and each statement of the motive is numbered, according to the chronological order of their occurrence, on Figure 2.4. Each **B**-form is (hyper) metrically oriented around its third eighth which we will call the "post" of the **B**-motive. At first the **B**-forms are set at a distance of 12 eighth notes (equaling one hypermeasure) between "posts" (*eg.* B1 to B2); soon, however, they are placed at six eighth notes intervals, equaling  $\frac{1}{2}$  hypermeasure, between "posts" (*eg.* B2 to B3, B3 to B4, *etc.*). One characteristic of motive **B** is the two eighth notes that are an anticipation of the "post". When the additional statements of **B** occur in measures 186a and 187a, the motive is placed so that the "post" occurs on the downbeat and thus the two eighth notes function as anacrusis. B5 omits the two note anacrusis because it immediately follows a statement of motive **C** and the result is that B5 starts right on the downbeat of m. 187a. The statement still contains the five pitch attacks that are characteristic of the motive but the omission of the anacrusis requires that the first two pitches be played as sixteenth notes in order to complete the motive by the start of the second beat of the measure. The sixteenth-notes are maintained in B6 but this time they are reinstated as an anacrusis, thus placing the "post" on (hyper) beat three.

Motive **C** initially lends emphasis to the third (hyper) beat of mm. 184a and 185a and thus, as indicated above, reinforces the waltz hypermetre. (Statements of motive **C** are also numbered on Figure 2.4.) As in motive **B**, the statements of the motive initially occur at intervals of twelve eighth notes. In m. 186a, however, the statements of the motive increase in frequency and occur at six eighth note intervals. The eventual breakdown of the waltz is anticipated most clearly by this motive, since it undergoes variations that serve to disrupt the metre. C3, in m. 186a, is condensed in order to allow for the start of motive **B** which follows immediately in the viola. The statement of C4 is delayed by a dotted-eight rest in the second half of m. 186a and the repetition of the first pitches resembles motive **B**. The next statement is shifted by a sixteenth rest. Thus, in the final measures of the waltz the attack density on beats one and three decreases slightly. This serves to create an arch of sorts in the waltz: after starting with only one attack on the downbeat of each (hyper) measure (mm. 184a-185a) the attack density reaches its climax in the middle of the waltz (m. 186a) and is gradually lessened, by the shifting of motive **C**, at the close of the waltz.

The preceding discussion has focused on the quadruple, or in some cases duple, divisions of the bar as hypermetric phenomena. There are some additional points of discussion in relation to the subdivision of each dotted quarter note into three eighth notes, the characteristic which leads this passage to be viewed as a quick waltz. These shorter rhythms provide much of the forward momentum in this passage. In mm. 184a-185a (Figure 2.4) one observes the emphasis, sometimes slight, that is afforded the second eighth note of each  $3/8$  grouping. The clearest indication of this emphasis is the anticipation of motive **B** which begins on the second eighth of  $3/8$  (with the exception of B5 and B6). The second pitch of motive **B** is always preceded and followed by leaps and, with the exception of B1, the leaps are in the opposite direction. Thus,

contour also serves to emphasize the second beat. In addition, motive C features a leap to the third sixteenth (until the end of m. 186a) which also affords a subtle emphasis to the second eighth of each dotted-quarter sub-group.

The metric and rhythmic issues suggest that this passage is formed in the manner of a 'traditional' waltz. The moments of metric imbalance, but not instability, push the music forward. In addition, the clear motivic basis of this passage provides the cohesion typically associated with the phrase structure of a waltz. It is, however, necessary to further pursue this concept. Does this passage actually support an antecedent-consequent relationship as the waltz from m. 86 did?

There are four "phrases" in this passage, each of which, in mm. 184a-185a, encompasses one statement of each motive. In mm. 186a-187a, each motive is stated twice in each phrase. Although shorter than the traditional understanding of a phrase, each notated measure has already been shown to be a hypermetric grouping of four  $\frac{3}{8}$  measures. There is a clear link between the first and second phrases: the first phrase presents the three distinct motives of the waltz in the context of a  $W_8$  hexachord and the rhythmic figures are then repeated using pitches of the complementary hexachord  $z_8$  in the second phrase. This relationship suggests that the second phrase "answers" the first and that mm. 184a-185a do form an antecedent-consequent relationship. The use of the complementary hexachord to complete the aggregate reinforces this connection.

Measure 186a has several features which mark it as the start of at least a new phrase, and possibly a new phrase group. As indicated in Table 2.3, the order numbers of motives are inverted at the start of this phrase which marks a distinctive shift in the passage. There are also textural changes which indicate that a new phrase group has begun. Motive A, arguably the

‘theme’ of the waltz, moves to the cello, subdividing the melody into two-measure units. Finally there is a sudden increase in attack density brought about by the simultaneous entries of motives **A**, **B**, and **C** in m. 186a. Measures 186a-187a then proceed in a manner parallel to the first phrase group. As indicated above in Figure 2.3 the aggregate is completed linearly, similarly to the first phrase group, with the addition of vertical aggregates. The increase in activity, and the aforementioned variations of rhythmic motives, suggest that the second phrase group is an elaboration of the first. The relationship between mm. 186a-187a and mm. 184a-185a implies that the entire passage could be a double period.

The suggestion of an ‘implied’ double period is intentional. In light of earlier events in the Trio when closure or continuation is implied but never fulfilled, as in the waltz of m. 86, it is necessary to determine if mm. 184-188 (as notated) actually complete a double period by achieving closure. Motives **A** and **B** do not continue in m. 188 which suggests that the waltz has reached its conclusion. The staggered entries of the motive have been maintained, though obscured, and the passage concludes with the motives stopping in the order in which they started. The result is that each motive concludes at different times. However, unlike motives **A** and **B**, motive **C** does not conclude and is immediately continued in a canon (which will be discussed in Chapter 3). Although a sense of stability has been achieved with a return to the notated metre, a sense of closure is still avoided because of the continuation of motive **C**. However, the projected four - dotted quarter note timespan beginning on beat 2 of m. 187 is completely “realized” by the beginning of the canon on beat 2 of m. 188 (that is, as outlined in the new alignment, m. 187a reaches a clear conclusion)— so there is a sense of metric fulfillment, if not melodic/textural/rhythmic closure.

The lack of closure to this passage is reminiscent of the end of the waltz from mm. 86-91. As was indicated in the first section of this chapter, the waltz from m. 86 has two phrase groups, the second of which is not completed. Instead, characteristic features are either eliminated or varied so that they hold little in common with the original motive. When motives **A** and **B** of the waltz from m. 184-188 are eliminated in m. 188, it becomes clear that the waltz itself has ended. However, the new continuation with the rhythms of motive **C** means that the waltz never actually reaches a clear conclusion. The result is that passages of heightened stability – the waltzes – give way to the unstable passages through a process of “developing liquidation” that will be the focus of Chapter 3.

## CHAPTER 3.

## FORMS OF INSTABILITY

Analyses of the String Trio tend to focus on the element of discontinuity that seems to pervade the piece. In "Memory and Rhetorical Trope in Schoenberg's String Trio," Michael Cherlin writes of *imperfection* (his term) being "achieved by juxtaposing musical ideas that irreconcilably conflict with one another."<sup>16</sup> Martin Boykan believes that avoidance of the traditional transition and development contributes to the Trio being heard as a series of "little fragments, one after the other."<sup>17</sup> The placement of stable themes in the midst of (sometimes lengthy) unstable passages, does create an element of contrast which becomes a characteristic of the String Trio. However, true juxtaposition, which is the placement of contrasting ideas 'side-by-side' without intervening music, is a relative rarity. In addition to the contrast between passages, the unstable passages do not feature the unity of the stable themes and so discontinuity, created by fluctuations in motive and metre, seems to be their central characteristic. The fluctuations heard in these moments of the String Trio are often "only on the surface." The following analysis will show that many of the unstable passages, which may appear to create discontinuity in the Trio, actually provide connectives between contrasting musical ideas.

Schoenberg's writings about fluency in music provide analytical concepts for examining the function of the unstable passages in the Trio. He discusses two techniques for the connection

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<sup>16</sup>Cherlin, "Memory and Rhetorical Trope," 567. By "imperfection" Cherlin refers to an action not yet completed (565) which he also applies to moments of the Trio that suggest a continuation but are somehow "diverted, disturbed, or disrupted"(567).

<sup>17</sup>Martin Boykan, "The Schoenberg Trio: Tradition at an Apocalyptic Moment," in *Music of My Future: The Schoenberg Quartets and Trio*, ed. Reinhold Brinkmann and Christoph Wolff (Cambridge, Mass.: Harvard University Department of Music, 2000): 162.

of contrasting musical ideas: *liquidation* and *transition*.

Liquidation is the process of “gradually eliminating characteristic features, until only uncharacteristic ones (having little in common with the previous passage) remain . . . .”<sup>18</sup> In this manner, liquidation serves to “neutralize the previous obligations” of a passage so that a new musical idea may be introduced.<sup>19</sup> If the distinctive features of the previous theme have been eliminated, and its obligations neutralized, then the entrance of a contrasting musical idea does not “violate the feeling of balance. It is as if everything began anew.”<sup>20</sup> Thus, contrasting musical ideas may be introduced in close proximity to one another and, if a liquidation intervenes, juxtaposition can be avoided.

Brief incidental interjections of new motives may occur in a liquidation but they are not (yet) developed further because the features of the previous passage are still prevalent.<sup>21</sup> It may be, however, that nearing the end of a liquidation new motives are introduced which are then continued and developed. At this point the passage becomes a *transition*.<sup>22</sup> Because the “obligations” of the previous theme have been eliminated (through liquidation) it is possible to gradually introduce the characteristics of a new goal idea.<sup>23</sup> Thus, when a new musical idea enters many of its features have already been alluded to, explicitly stated, or otherwise prepared.

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<sup>18</sup>Arnold Schoenberg, *The Musical Idea and the Logic, Technique, and Art of its Presentation*, ed. and trans. Patricia Carpenter and Severine Neff (New York: Columbia University Press, 1995), 382.

<sup>19</sup>Ibid., 252.

<sup>20</sup>Arnold Schoenberg, “Connection of Musical Ideas,” *Style and Idea* ed. Leonard Stein, trans. by Leo Black (Berkeley and Los Angeles: University of California Press, 1975), 288.

<sup>21</sup>Schoenberg, *The Musical Idea*, 161.

<sup>22</sup>Schoenberg, “Connection of Musical Ideas,” 288.

<sup>23</sup>Schoenberg, *The Musical Idea*, 253.

The following analysis will show that this form of transition is relatively rare in the String Trio and that contrasting musical ideas are often introduced immediately following a liquidation, with no attempt at a gradual introduction of the new theme's characteristics. In these circumstances the entrance of the contrasting musical idea is abrupt but it is not a juxtaposition. Since the features of the preceding musical idea are eliminated by the liquidation the blunt contrast of juxtaposition is avoided.

The function of unstable passages in the String Trio, however, is not always as clearly delineated as the aforementioned definitions of liquidation and transition might suggest. The implication of the definitions is that it is a straightforward matter to trace the dissolution of a musical idea through the elimination of its characteristic features and, when the liquidation is completed, to identify the start of the transition (or of a new idea). In reality, the unstable passages in the String Trio are often only *characterized* by liquidation because they also include processes that are developmental in nature – that develop “uncharacteristic” features. The development of a musical idea allows for levels of textural complexity which prevent the unstable passages from functioning merely as a link between two contrasting stable passages. The development may also serve to further the process of liquidation, by developing aspects of a musical idea to a point that the result is quite different from – and uncharacteristic of – its initial statement. In order to capture the essence of this process, I will use the expression “developing liquidation” when the purpose of a passage is to eliminate the characteristic features of a previous musical idea and, in the process, to develop features that give the passage a character of its own – one that is “uncharacteristic” of the material that has been liquidated.

The analytic focus in this chapter will be the passages that surround the waltz structures

discussed in Chapter 2. The measures leading up to the waltz at m. 86 will be shown to function as a transition by introducing several of the waltz's characteristic features. The avoidance of closure in the waltzes of mm. 86-91 and mm. 184-188 was indicated in Chapter 2, and here the developing liquidation that follows these themes will be discussed. In a manner similar to the waltz of m. 86, several of these transitional or liquidating passages (or elements of them) are recapitulated near the conclusion of the Trio and these later restatements will also be studied in this chapter.

Case 1a: A transitional passage (mm. 79-85).

The first example to be considered here is the passage, preceding the waltz of m. 86, which is reproduced in Example 3.1. The stability of the waltz of m. 86 was shown to result from several factors: a well-established hypermetre of four-3/8 measures; uniformity in the division of the hexachords between the instruments into motives of specific order number (indicated below in Table 3.1) which are retrograded in m. 88 and "inverted" starting in m. 90; and the ordered intervallic content of the melody line  $\langle -4, -1, +16, -7, -1, +6, -11 \rangle$  which is also retrograded in m. 89 when the line is played by the viola. These factors contribute to the formation of an antecedent-consequent phrase group.

In contrast to the waltz, mm. 79-85, reproduced in Example 3.1, do not exhibit any such stability. The violin line consists of several distinct rhythmic figures which appear to have little in common (such as the sixteenth-note figures and the descending *glissando*). In addition, the transposition level of the hexachords changes from  $Z_8/RZ_8/Rw_8$  to  $W_5/w_5$  and  $Z_5/z_5$  in m. 81, as indicated on Example 3.1a. This passage, because of its lack of motivic and transpositional

### Example 3.1 – Measures 78-86

78 *ponticello*.....  
[arco] *p*.....  
*P* arco.....  
*p* col legno tratto.....  
*pizz.*.....  
(Moderato ♩ = 72)  
Quasi Recitativo  
80 *W5*.....  
sul G..... sul D..... *pizz.*..... arco.....  
*W5* *colla parte*.....  
*arco colla parte*.....  
*W5* Poco più mosso ♩ = 84  
83 *a tempo*.....  
*f*..... *pizz.*..... *arco*..... *saltando*.....  
*W5*..... *W5*.....  
*p*..... *f*..... *saltando*.....  
*W5*..... *W5*.....  
85 *poco rit.*.....  
*p*.....  
6  
8

continuity might be dismissed as one that disrupts the flow of the String Trio, but we shall see that it actually functions as a transition by enacting shifts which prepare for the eventual arrival of the waltz in m. 86.

**Table 3.1 – Order Number Motives (mm. 86-91)**

Motive	Order Numbers	Characteristic Features
<b>A</b>	<0,1,3,5> or “inverted” <5,4,2,0>	dotted-rhythm
<b>B</b>	<2,4> or “inverted” <3,1>	semitone dyad
<b>C</b>	<0,1,2,3,4,5>	sixteenth-notes

The transition to the waltz builds out of the liquidation of a motive that was first introduced in mm. 57-58. The violin’s four-note motive in mm. 57-58, reproduced in Example 3.2, is characterized by its pitches B $\flat$ 3-A3-C $\sharp$ 4-G $\sharp$ 3 and the resulting progression of intervals: <-1, +4, -5>. (This motive is expanded, through repetition, to create a short phrase which ends in m. 62.) The complete development of this motive need not be of concern here except for its final statement by the cello in m. 79, rhythmically varied but using the same pitches. The violin accompaniment of the cello’s motive marks an increase in rhythmic activity by playing sixteenth notes. The violin line also “doubles” the cello line (with a bit of additional figuration), something that is unusual in the twelve-tone idiom.

**Example 3.2 – Motive (mm. 79-80)**

intervals    -1    +4    -5

After these final statements of the B $\flat$ -A-C $\sharp$ -G $\sharp$  motive in mm. 79-80, a slight break is created by rests in each instrument at the end of m. 80 and on the downbeat of m. 81. In the following measures, several new motivic and rhythmic ideas are introduced which indicate a change from the previous musical idea. Changes in transposition level and texture, including the introduction of new musical figures in the violin (for example, the descending *glissando*) and the gradual elimination of the formerly nearly steady pattern of sixteenth-notes in the violin line also indicate a shift in m. 81. The result is that there is a division between mm. 80 and 81 which marks the beginning of a new musical idea. It will be shown that mm. 81-85 function as a transition to the waltz and thus the break in m. 81 marks one of the few locations in the Trio when the start of a transition is clearly indicated as a new section. However, the break between mm. 80-81, and the introduction of new motivic material, should not suggest that there is a sudden contrast in m. 81. In fact, there are many similarities in motivic material, like the recurrence of a sixteenth-note motive, and there are similarities in pitch as seen with the G4-E $\flat$ 5 played by the viola in m. 80 which nicely sets up the violin's G4-E $\flat$ 4 in m. 81. In addition, the violin figure in m. 81 is a parody of the <-1, +4, -5> motive as it plays the intervals <-4, +5 (+12), -6 (-12)>

The transitional nature of the passage is heard most clearly in the progress of the violin line. At first, the sixteenth notes in m. 79 generally alternate between two pitches, but there is a gradual increase in pitch variety until m. 83. After the 'interruption' of the descending *glissando* motive in m. 81 sixteenth-note rhythms return, but sixteenth-rests are now often interjected in the midst of the motive. The addition of the rests is significant because they are a feature of the triplet-sixteenth rhythmic motive that assumes final shape in m. 83. Measures 83-85 are a

contrast to the preceding music, in part due to the increase in tempo and attack density in all instruments, but the gradual rhythmic process which has just been observed in the violin line of mm. 79-82 is a preparation for the motive of m. 83. In mm. 81-82, the viola and cello have also been developing the idea of playing together, but with some hocketing (m. 82); the increase in instrumental and rhythmic density prepares for the entries in m. 83, and the increasing isorhythmic density that they effect.

Measure 83, however, is not the ultimate goal of the violin's transition. This is made apparent when the initial motive of m. 83 is almost immediately reduced to a series of repeated pitches in each instrument. Thus, mm. 83-85 are a further step in the transition to the waltz which begins in m. 86. One of the most significant occurrences in m. 83 is the grouping into five sixteenths and a sixteenth rest, (subdivided triplet eighths) with the 5<sup>th</sup> sixteenth metrically strong, which creates the sense of 3/8 metre. This metric scansion anticipates the eventual shift to the notated 6/8 metre of the waltz and prepares for the hypermetre of four-3/8 measures. As a result of the shift to (subdivided) triplet-eighths in m. 83, the notated change of metre occurring in m. 85 is not perceived as a metric change, but only as a tempo change. Measures 83-85 also introduce double stops, which are utilized frequently in the opening measures of the waltz. Michael Cherlin discusses the element of transition before the waltz and refers to mm. 81-85 as an "extended anacrusis," recognizing that the relationship is heard only in hindsight once the waltz has been established.<sup>24</sup>

There is a subtle element of closure – or liquidation – to the transitional passage in m. 85, as the cello line descends in range and slows in tempo, as indicated by the *poco rit.* This effect


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<sup>24</sup>Cherlin, "Memory and Rhetorical Trope," 595.

does not detract from the transition however, which has effectively prepared for many of the distinctive features of the waltz.

Case 1b: The transition recapitulated (mm. 244-250).

Measures 244-250, reproduced in Example 3.3, recapitulate mm. 79-85 and provide an example of how Schoenberg alters a passage for its recapitulation. Measures 244-245 are the final statement of the four-note motive  $B\flat-A-C\sharp-G\sharp$  (which was re-introduced in mm. 238-239), and they present an unaltered recapitulation of mm. 79-80. The hexachords of mm. 246-247, notated on Example 3.3, are at the same transposition level as the original passage (refer to Example 3.1) but mm. 246-247 are an altered recapitulation of mm. 81-82.

While the rhythmic figures are unchanged, the pitches associated with each rhythmic motive in mm. 246-247 are derived from the hexachord that is the complementary inversion of the one used for the same rhythmic figure in mm. 81-82. For example, the pitches of the violin's rhythmic figure  are derived from hexachord  $W_5$  in m. 81, but in the recapitulation (m. 246) the complementary hexachord  $w_5$  is used for the same figure. The result is that the pitches of mm. 246-247 are related to mm. 81-82 by  $I_7$ . Already observed in the analysis of the recapitulation of the m. 86 waltz in Chapter 2, this approach to altering pitch structures allows for clear similarities between the "original" and recapitulated passages, without resorting to an exact pitch repetition. The use of inverted hexachords is continued in m. 248 but at this time the counterpoint is also inverted. In m. 83 the order of entrance is violin – viola – cello; here it is "inverted" to cello – viola – violin for the recapitulation.

In m. 248 the notated metre changes to 12/8 which results in a triple subdivision of each



beat (in the waltz hypermetre of four- $\frac{3}{8}$  measures) and is parallel to the metric shift that is heard, though not notated, in m. 83 (see above in Example 3.1). Thus, to this point mm. 244-250 appear to be functioning in the same manner as mm. 79-85; as a transition which introduces new motives and a change in metre. Since mm. 79-85 functioned as a transition to the waltz in m. 86, we expect that mm. 244-250 are preparing for a recapitulation of that waltz. However there is an unexpected juxtaposition when the waltz does not occur, as expected, in m. 251. Instead, Example 3.3 shows that in m. 251 there is a recapitulation of a *Quasi Recitativo* passage (which occurred for the first time in m. 105) in 4/4. As a result, the transition in mm. 244-250 is thwarted by the recapitulation of the "wrong" material. In fact, the waltz is recapitulated at m. 263, but by that time so much contrasting material has intervened that the preparation provided by the transition has been negated.

The interruption of the *Quasi Recitativo* is one of the moments of "true" juxtaposition in the String Trio, in part because of the expectations built by the progression in mm. 248-250. The triple subdivision of the beat is clearly established by the shift to 12/8 in m. 248 and the single measure of 6/8 in m. 250 but the shift to 4/4 in m. 251 is unprepared. The change in motivic material, with the addition of descending *quasi glissando*, and the *recitativo* feeling of the passage means that the musical ideas introduced in the transition are abruptly eliminated. The sudden entrance of contrasting material disrupts the expectations created by the preceding passage which was clearly transitional in nature.

It should be pointed out, however, that when the waltz of m. 86 is recapitulated, in m. 263-266, it is prepared by a brief transition. Example 3.4 (mm. 257-265) reproduces the measures leading up to the recapitulation of the waltz in m. 263 and the first three measures of

Example 3.4 – Measures 256-265

256

*agitato* *P* *ff* *fpp* *fp* *ppp* *ponticello* *sempre ponticello*

259

*poco rit.* *rit.*  $\text{♩} = 54$

263

(A tempo)

*(P) spiccato* *(P)* *P* *p*

the waltz itself. Note that, until m. 260, there is no clear motivic material and no pulse is clearly established, in part due to the frequent placement of attacks on off-beats. Thus the introduction of the clearly demarcated triplets in m. 260 are a significant change in the passage. The triplets serve to prepare for the shift to 6/8 in m. 261 by introducing a triple subdivision of the beat. In addition, the dotted quarter notes in m. 261 and the eighth note-quarter note figures in the violin and viola of m. 262 become characteristic features of the waltz theme. The transition is brief but it does prepare for the waltz hypermetre. In this manner, Schoenberg bridges the gap, created by the interrupting *quasi recitativo* in m. 251, between the recapitulated transition to the waltz and the recapitulation of the waltz itself.

#### Case 2a: A Developing Liquidation (mm. 91-111)

As seen in Chapter 2, the waltz that begins at m. 86 starts to dissolve around m. 91. Example 3.5 reproduces the final measures of the waltz (mm. 91-92) and continues up to m. 99. In m. 91, the cello includes a diminuted variant of the dotted-note motive (indicated by a square bracket on Example 3.5). This characteristic motive of the waltz is embedded in a stream of sixteenth notes, and is slightly obscured on that account. In m. 92 the diminution of the rhythmic motive recurs, the viola line drops out, and the transposition of the hexachords is changed from  $W_8$  and  $w_8$  to  $W_5$  and  $z_5$  (a shift which briefly parallels the transition to the waltz where the  $W_5$  and  $z_5$  hexachords were the basis of the transition and shifted to  $W_8/w_8$  for the waltz itself). The presentation of the hexachords is also altered in m. 92: the complementary hexachords are consecutive rather than in counterpoint (as they were earlier in the waltz). Within two measures therefore, one can already hear that characteristic elements of the waltz are being altered.

Example 3.5 – Measures 91-99  $w_5$   $z_8$   $w_9$   $z_9$

91  $w_5$   $z_8$   $w_9$   $z_9$

2 4 2 4

*spiccato* *p scherzando* *p spiccato*

0135 01 3 5

(-4 -1 +4 +5 -1 +6 +1)

94  $z_9$   $w_9$   $z_9$

*spiccato* *p spiccato* *mf cantabile*

5 3

96  $w_9$   $z_9$   $w_9$   $z_9$   $w_9$   $z_9$  *poco a poco*

1 0 5 3 1 0

-6 +1 +7 -4 +1 -8

2 4 2

99 *accel.* *pizz.* *Meno mosso* *p* *120* *sul D...* *arco*

*pizz.* *pizz.* *arco* *gliss.* *gliss.* *gliss.*

*ff* *gliss.* *gliss.* *gliss.*

*ff* *sul C*

However, the waltz is not suddenly abandoned; we shall observe that many of its features persist and the subsequent passage serves as one of the clearest examples of developing liquidation in the String Trio.

The order numbers of each hexachord are notated on Example 3.5, revealing that the division of the hexachords in m. 92 projects the same order number motives  $\langle 0,1,3,5 \rangle$  and  $\langle 2,4 \rangle$  that were used in the waltz of m. 86 (see Table 3.1 above). In m. 92 the cello plays order numbers  $\langle 0,1,3,5 \rangle$  with a dotted rhythmic figure derived from motive **A**. At the same time the violin plays motive **B**, order numbers  $\langle 2,4 \rangle$  of the current hexachord. This reveals that, despite variations in rhythm and pitch, m 92 is still closely related to the waltz. (The characteristic features of each motive were also included in Table 3.1 because they also will be used in the developing liquidation to refer to the waltz of m. 86.) Another indication that m. 92 continues elements of the waltz is that the intervals of the cello line, written below the score in Example 3.5 and enclosed in parentheses, show that the pitch intervals of the waltz melody in mm. 86-87 are played in rhythmic diminution. (For reference, the violin melody from mm. 86-87 is reproduced in Example 3.6.)

**Example 3.6 – Interval Content of the Waltz Melody (mm. 86-90)**

86

intervals -4 -1 +16 -7 -1 +6 -11 +1 +6 -1 -7 +16 -1 -4

While m. 92 clearly continues elements of the waltz, mm. 93ff seem to indicate a shift to new material. However, the rhythmic pattern of mm. 93-95 continues the characteristic sixteenth-note rhythm of motive **C**, and there is a reference to motive **A** in m. 95 when the cello plays a dotted rhythm with an agogic accent on the second eighth note. This is a clear, though slightly varied, reference to the waltz melody's rhythmic motive but there are no links in pitch or set class. The re-introduction of the waltz motive is not a blunt juxtaposition however, because there is a pitch relationship to the preceding measure which serves as a link between the two abutted sections. The violin's  $\langle C, D\flat \rangle$  in m. 93 is easily heard as a (reversed) echo of its  $\langle C\sharp, C \rangle$  in m. 92. In fact, the violin continues on to complete the tetrachord  $\langle C, D\flat, F, E \rangle$  which is  $T_4$  of the violin tetrachord motive  $\langle G\sharp, A, C\sharp, C \rangle$  in m. 92. The two motives are linked by their common  $\{C, C\sharp\}$  dyad.

The relationship between these figures and the waltz is strengthened with the violin and viola entries at the end of m. 95 because both lines have strong pitch-related connections to the waltz of m. 86. The hexachords  $Rz_9$  and  $RW_9$  are one semitone higher than those in the waltz, but Schoenberg maintains the interval structure that was a significant characteristic of the waltz. The violin line is a transposed retrograde of the violin in mm. 86-87, (reproduced above in Example 3.6). In addition, the order numbers of the violin (notated on Example 3.5 in angle brackets) are a retrograde of the waltz's motive **A**. The viola's semitone dyads retrograde motive **B** of mm. 86-87 by playing order numbers  $\langle 4, 2 \rangle$  of each hexachord. The reference to the waltz in mm. 95-96 occurs in a fast 3/16 metre and is therefore condensed to occur in half the time of the original melody. Thus, despite the interjection of seemingly unrelated material in mm. 93-94 (which was shown to maintain elements of motive **C**) the waltz is not completely liquidated in m.

96. In addition, the rhythmic variation of the waltz theme in m. 96 reveals that the development of the waltz is ongoing.

The developing liquidation is continued in the subsequent measures. The sixteenth-note double-stop figure that is predominant in mm. 97-99 (see Example 3.5) is reminiscent of the motive first played by the cello in m. 86 and reveals that at least one characteristic feature of the waltz still persists. In these measures, however, another characteristic feature of the waltz – its 6/8 metre – is weakened. A shift in metre was suggested above in relation to the 3/16 in the violin line of m. 96, however, another metric change that moves away from a triple subdivision of the beat is initiated with the last two eighth notes in the viola and cello in m. 96. This metric shift is established more securely than the preceding momentary allusion to 3/16. The pitches of the cello line from the end of m. 96 into m. 97 are grouped into four pairs of eighth notes (each dyad is given a slur). This suggests a shift to 4/4 (as indicated in Figure 3.1 which re-bars the passage) in conflict with the notated 6/8. On Figure 3.1 the notated barlines are indicated with a dotted line and the new metre is indicated by solid lines. The measures in the suggested alignment are numbered 97a and 98a to distinguish them from the notated measures. The 4/4 metre suggested by the cello is further clarified by four more eighth-note dyads in the viola in m. 98a. Semitone dyads, prominent in these cello and viola lines, are a reference to the inner voice of the waltz: the viola in mm. 86-87 and the cello, in mm. 88-89, both featured semitone pairs.

The viola and violin sixteenth rhythms on Figure 3.1 are also significant in relation to the cello's shift in metre just described. The viola figure in m. 97a aligns with the metre implied by the cello. The violin plays the same figure as the viola, but begins an eighth note later, hocketing with the viola. As indicated above, the viola continues the 4/4 semitone pattern in m. 98a.

**Figure 3.1 – Alternate Scansion: mm. 97a - 98a**



The metric shift in mm. 97-98 once again suggests that the waltz has been completely liquidated, but some characteristics of the waltz still remain. First is the similarity of the violin and viola's rhythmic figures to motive C, which was noted above. In addition, the hexachords, despite being at a different transposition level, are once again divided between the instruments in a similar manner to the waltz. The violin and viola, which play the same sixteenth-note rhythmic figure, combine to play order numbers <0,1,3,5> of the current hexachord, noted on Example 3.5. The cello plays the remaining order numbers <2,4>. Finally, in m. 98a, a dotted rhythm, reminiscent of the waltz's motive A, is played by the violin. These relationships are obscured by the rhythmic and metric differences which reveals the extent to which the developing liquidation of the waltz has occurred.

In m. 99 there is another metric shift as the cello starts to project 3/8 (the metre of the waltz) with the  $\text{♩} \text{♩} \text{♩}$  rhythmic figure. The viola echoes the rhythm one eighth later, as can be seen in Example 3.7, which reproduces mm. 99-107. While, the metre of the waltz is again

invoked, the introduction of new musical ideas and the lack of further references to the waltz actually suggest a definitive motion away from the predominance of the waltz. Additional factors that indicate a change in the progress of the passage include an increase in tempo, indicated by the *accelerando* in m. 99 and the musical figures in mm. 100-105 which feature more variety in pitch than mm. 94-99 (which had a greater attack density but typically repeated pitches and thus completed aggregates more slowly).

Measure 105 marks a notated change to 4/4 which echoes the metre projected by the music in mm. 96-99 (Figure 3.1). However, as suggested by the designation of *Quasi Recitative*, the metre is not rigid. Attacks do not always coincide with the notated metre and often occur on off-beats, thus disrupting any possibility of metric stability. The musical figures in the *Quasi Recitative* are not new: the sixteenth-note figures in the violin line of m. 106 are similar to the violin and viola motives of m. 104. In addition there is a clear relationship to mm. 81-82 which were part of the transition to the waltz. The hexachords in m. 105 are transposed up a semitone from  $W_5/w_5$  and  $Z_5/z_5$  in m. 81 to  $W_6/w_6$  and  $Z_6/z_6$  in m. 105. The violin in m. 105 plays the same rhythmic figures as m. 81 and there are strong similarities between the rhythmic figures of the accompaniment voices. As suggested by the designation of *Quasi Recitative*, these musical figures are still quite unstable metrically and the passage seems unable to grasp a motive which is capable of further development into a thematic idea.

The violin line introduces a new thematic idea at the *a tempo* in m. 107, reproduced in Example 3.8. There is a clear rhythmic motive, indicated by the slurring of the thirty-seconds to the following eighth-note, which is repeated several times in the subsequent measures. Although this theme does not build upon the features introduced in the preceding transition, it seems

## Example 3.7 – Measures 99-107

99 *accel.* - - - pizz. - - - *Meno mosso*  $\text{♩} = 120$  *P* sul D..... arco

102 pizz. arco  $(\text{♩} = 72)$  pizz. arco

105 *Quasi recitative* ( $\text{♩} = 72$ )  
(sul G.....) (sul D.....)

107 *a tempo*  $\text{♩} = 72$   
*saltando*

likely that the increase in intensity was intended to lead to and prepare this new idea. The theme suggests itself as a fugue subject and there is an expectation that it will develop into a stable (or at least predictable) imitative process.

**Example 3.8 – Measures 107-111**

107 *a tempo*  $\text{♩} = 72$   
*sf* *p* *saltando* *P* *p saltando sf*  
 (023457) (023457)

110  $\text{♩} = 72$  *a tempo* *P*  
*p* *p* *sf*

Serially, mm. 107-109 are an anomaly for the String Trio. The 12-note subject and answer is grouped into two hexachords, labelled on Example 3.8, with the first occurring in the violin and the second in the viola. The (unordered) hexachord of the violin line consists of the pitch classes  $\{C\#, D\#, E, F, F\#, G\#\}$  and its set class, in contrast to the rest of the String Trio, is

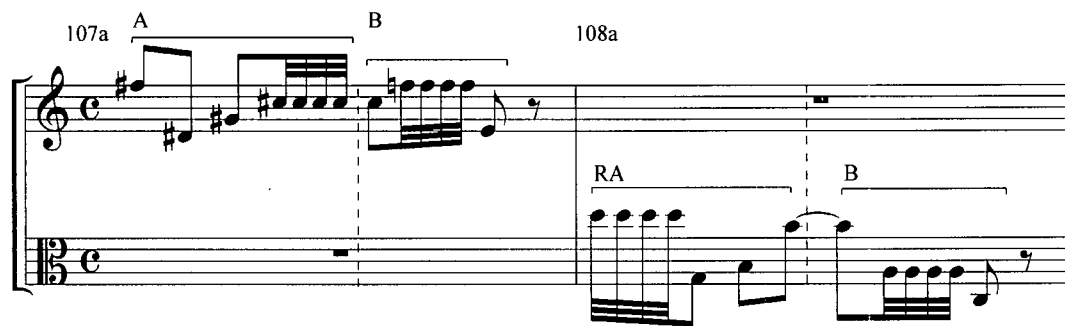
the symmetric type (023457). The complementary hexachord in the viola is also a (023457) representative containing the pitch classes: {G,A,B $\flat$ ,B,C,D}. It has been observed that hexachords other than (012367) may be derived from the source hexachord. For example, as shown in Chapter 1, the chromatic hexachords in mm. 12-17 occur when the violin plays the first and last pitches of six consecutive (012367) hexachords. In mm. 107-109 however, the (023457) is the only hexachord present. There is a clear similarity between the (023457) and (012367) hexachords since both contain a (0123) tetrachord, but this does not diminish the fact that the hexachords of this passage are in contrast to the rest of the String Trio.

The “fugue” theme begins in m. 107 in a measure that is notated in 5/4. This metre is not projected, however, partly as a result of the attacks placed on off-beats in the first half of m. 107 (which conclude the previous musical idea), but also because the contour-accented attack of F $\sharp$ 5 appears to function as a downbeat rather than as the fourth beat of the bar. The notated metre changes to 4/4 in m. 108 but the emphasis on the previous F $\sharp$ 5 suggests that the 4/4 metre actually begins in m. 107. Figure 3.2 realigns the metre to reflect this shift. The result of this metric scansion is that a passage that initially appears unstable because of the notated shifts in metre, is actually quite stable.

The rhythmic motives combining thirty-second and eighth notes are the basis of this fugue-type theme. The violin starts with the rhythmic motive labelled **A** on Figure 3.2 which is retrograded by the viola (**RA**) in m. 108a. In both instruments the **A** motive is followed by a variant labelled **B**. The unity that this relationship between rhythmic motives could create is, however, slightly disrupted by the tie that links motives **RA** and **B** in m. 108a. The similarities, both harmonic and rhythmic, between the violin and viola suggest an antecedent-consequent

period that aligns with the metric scansion of Figure 3.2. Thus, the earlier statement regarding the expectation that this theme will develop into a stable imitative process (as in a fugue) is supported by the level of unity in the theme. Indeed, the antecedent-consequent turns out to be so stable that no further imitation is forthcoming.

**Figure 3.2 – Alternate Scansion: mm. 107a - 108a**



The stability of the theme's ending is interrupted, however, by the elided entrance of the cello in m. 109. In addition, the cello introduces yet another metric shift, this time to 3/4 (at first), by grouping the quarter notes according to the ascending and descending lines. Each grouping of pitches is indicated by a square bracket on Example 3.8 which reveals that 3/4 is not projected for long since Schoenberg notates a deceleration in the cello line. The last duration of the second grouping of dyads is extended by an eighth note (suggesting a grouping of 7/8). The final D $\flat$  of the cello line is extended to last a full 4 quarters, resulting in a grouping of 4/4. This notated deceleration enacts a return to 4/4, but the alignment still does not correspond with the notated measures. The 4/4 metre is continued in the following measures.

It is perhaps a little difficult to adequately account for this theme in the midst of a passage characterized by instability. Clearly this theme cannot be considered to be part of the liquidation

of the preceding waltz, since none of the characteristics of the waltz remain. In fact, the analysis has pointed to several attributes of stability that are unquestionably present: the clear, and regular, projection of the 4/4 metre (despite the irregular and “unstable” notation); and the antecedent-consequent period structure. These features create an expectation that the fugue theme will develop as a stable passage; perhaps by continuing with a phrase group that is parallel to the one introduced in m. 107 (in a manner similar to the passages analysed in Chapter 2). However, the cello line interrupts the theme and thwarts any possibility of the passage extending into one of stability.

Case 2b: The “Fugue Theme” Recapitulated (mm. 253-256).

The “fugue theme” is recapitulated in mm. 253-255 and follows a *quasi recitativo* as it did in the First Episode. Measures 253-257 are reproduced in Example 3.9. The hexachords in this passage are again symmetrical (023457)’s, as in the original passage, and are related to mm. 107-109 by a function of  $I_9$ , which results in a striking parallel between the two passages. Table 3.2 shows that the pitches of each hexachord are the same in both passages and the pitches of each dyad within the hexachord are reordered. The metric scansion of the passage occurs in the same manner as the original passage.

Despite the potential to develop further into an extended passage, the theme is recapitulated exactly. Considering previous events in the recapitulation, for example the interjection of the *Quasi Recitativo* in m. 251 instead of the prepared waltz, it is becoming clear that the goal of the recapitulation is not to obliterate the contrast between stability and instability. Rather, contrast is a significant characteristic of the Trio which is continued, and at times

emphasized, in the recapitulation.

**Example 3.9 – Measures 253-257**

253 (A tempo ♩ = 72) (023457)

5/4 [f] pp sf p saltando

4/4 P saltando

256

agitato P ff fpp

agitato P ff fpp

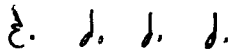

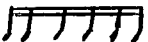
**Table 3.2 – Hexachords of the “Fugue Theme”**

Mm. 107-109	<F <sup>♯</sup> , D <sup>♯</sup> , G <sup>♯</sup> , C <sup>♯</sup> , F, E>	<D, G, B <sup>♭</sup> , B, A, C>
Mm. 253-255	<D <sup>♯</sup> , F <sup>♯</sup> , C <sup>♯</sup> , G <sup>♯</sup> , E, F>	<G, D, B, B <sup>♭</sup> , C, A>

Case 3: Another Developing Liquidation (mm. 188-207).

The waltz that begins in m. 184 was analysed in Chapter 2 and its stability was shown to result from several factors. First, the division of hexachords between the instruments is consistent throughout the passage and results in motives of order numbers, shown below in Table 3.3. In addition, each order number motive is associated with a rhythmic motive which, though varied in successive statements, creates a sense of uniformity. Finally, the waltz hypermetre, of four-3/8 measures, is clearly projected in the 12/8 metre.

**Table 3.3 – Motives (mm. 184-188)**

Motive	Order Numbers	Rhythmic Motive
<b>A</b>	<0,2,3> or “inverted” <5,3,2>	
<b>B</b>	<1,4,5> or “inverted” <4,1,0>	
<b>C</b>	<0,2,3,1,4,5> or “inverted” <5,3,2,4,1,0>	

The analysis in Chapter 2 indicated that the waltz begins to break down in m. 188 when motives **A** and **B** are discontinued. Motive **C** continues, however, and it expands upon the elements of imitation that were shown to be present in the waltz by developing the motive as a canon at the unison and then also at the octave, separated by an eighth note. The passage following the waltz is reproduced in Example 3.10. The canon begins in the cello as soon as the waltz's final statement of **C** concludes in the violin; there is no intervening pause which might prepare the listener for the coming change. Thus the waltz is denied closure by the onset of the canon.

Example 3.10 – Measures 187-194

187

*sempre ppp and without accentuations*

$W_1$   $Z_1$

*ppp*  $W_1$   $Z_1(A)$   $Z_1$

*ppp*  $W_1$   $Z_1$   $Z_1$

*ppp*

189

$W_1$   $W_2$   $Z_2$   $Z_2$   $W_2$

$W_1$   $W_2$   $Z_2$   $Z_2$   $W_2$

$W_1$   $W_2$   $Z_2$   $Z_2$   $W_2$

191

$Z_5$   $W_5$   $Z_5$   $Z_5$   $Z_5$

*ff* *gliss. slowly* *sul D* *ff* *gliss. slowly*

*ff* *3* *3* *feroce, ad libitum*

193

$Z_5$   $W_5$   $Lento \text{ } \text{♩} = 72$

*sul G* *gliss.* *feroce, ad libitum* *sul C* *gliss.* *feroce, ad libitum* *ffpp* *pp* *sul C*

The canon begins with hexachord  $w_{11}$  (related by a function of  $T_3$  to the previous  $w_8$ ), is followed by  $Z_{11}$ , and then continues with the complement of both hexachords. The ordering of the hexachords is the same as motive **C**  $\langle 0,2,3,1,4,5 \rangle$  (see Table 3.3 above). Example 3.10 labels the transpositions of the (012367) hexachord that are utilized throughout the canon and reveals that the  $T_3$  relationship continues: mm. 189-190 are derived from  $W_2/w_2$  and  $Z_2/z_2$  and m. 191 changes to  $w_5$  and  $Z_5$ . The aggregates are completed by using the complementary hexachord of a different ordering, but the 'correct' ordering of the complement occurs before the next change in the transposition level (for example the first four hexachords are  $w_{11} - Z_{11} - z_{11} - W_{11}$ ). This pattern was shown to occur in the waltz in Chapter 2. The first two hexachords in every transposition are ordered  $\langle 0,2,3,1,4,5 \rangle$  while the order-number inversion  $\langle 5,3,2,4,1,0 \rangle$ , which was also used in the waltz, is employed for the complement of each ordered hexachord.

The performers are instructed to play the canon "without accentuations" but the quadruple metre is suggested by the arrangement of the hexachords. Each hexachord occurs within the time span of one dotted quarter-note beat in 12/8. Thus, when the transposition changes every four hexachords it serves to reinforce the quadruple metre. At the end of m. 189 there is an augmentation of the sixteenth-note motive as the pattern shifts to eighth notes and the hexachords are extended beyond one beat in a 12/8 measure. The following hexachord (m. 190) is further altered in its rhythmic presentation by a pattern of alternating eighth and quarter notes. This final statement is the most unstable metrically since the upper voices must be syncopated in order to maintain the same durations between instruments. The augmentation suggests that the canon could continue to increase its durations until a logical conclusion of the process is reached, *i.e.* a statement of the canon in extended, and equal, durations. However, as with the waltz in

mm. 184-188, there is no real conclusion to the canon because it is interrupted in the next measure.

In m. 191, a rest briefly interrupts the progression of each line in the canon. The previous rests in the canon occurred in m. 189 and served to lengthen the distance between each voice of the canon from an eighth to a quarter note but because of the continued motion in the other voices, no interruption of the total texture is heard. In a similar manner, the rests in m. 191 can at first be heard as part of the canon by the listener. It is the continuation of each line in m. 191 which increases the significance of the rests in hindsight, because they are recognized to mark the breakdown of the canon. After the rest each instrument continues with a new musical idea but the voices no longer relate as a canon. Thus the canon, which denied closure to the waltz, is also unable to close.

With the breakdown of the canon the stability of the passage is, once again, undermined. However, another element of imitation, reminiscent of the canon, remains. In m. 191 the viola imitates the entry of the cello with a short-long rhythmic figure, indicated by a square bracket in Example 3.10. In addition, the leaps in both figures create a similarity in contour. The cello and violin lines have the same contour, <021>, while the viola is the retrograde <120>. The staggered entries also serve to continue the sense of imitation.

Measure 192 introduces new musical ideas with the violin's descending *glissando* and the triplet motive in the cello. The changes in the texture are mitigated by the fact that the  $W_5$  and  $z_5$  hexachords are the complements of those introduced in m. 191. Also, although altered rhythmically, the triplet motives are reminiscent of motive C in the waltz, which stated all pitches of a hexachord without intervening rests. Finally the combination of the *glissando* and

triplet motive introduced in m. 192 is continued in m. 193, again in the manner of imitative counterpoint. Each triplet motive states a different sequence of intervals, but each *glissando* spans 13 semitones and there are only slight alterations in the rhythm of each (combined) statement.

There is a brief interruption by the *Lento* in m. 193-194. Though in contrast to the preceding material, the interjection does not signify the conclusion of the developing-liquidation of the waltz because in m. 194 a sixteenth-note motive, reminiscent of the waltz, is played by the cello. Example 3.11 shows that the motive reorders the order numbers of the  $Z_5$  hexachord to  $\langle 5,3,2,4,1,0 \rangle$  which is the order-number inversion of the waltz's motive **C** (refer to Table 3.3). The recurrence of motive **C** reveals that the developing liquidation of the waltz is ongoing and that, to this point, no new material has been introduced that would signify the start of a new, and distinct, musical idea. The remaining pitches of the cello line in m. 194 are a rhythmic variation of motive **C**. The hexachord used is unclear, though the best ordering seems to be  $w_5$  which results in order numbers  $\langle 0,3,2,4,1,5 \rangle$ . This hexachord is the most likely since it maintains a similarity to the waltz's motive **C**  $\langle 0,2,3,1,4,5 \rangle$ . This slight variation is another example of the development of the waltz's characteristic features.

The reference to the waltz is short-lived and is immediately followed by new musical figures. However, the *glissando* at the end of m. 194 provides an element of closure to the fragment which somewhat lessens the abrupt change brought about by the new musical figures including the shift from *pp* in m. 194 to *ff* and the tempo increase. In addition, the texture has increased from a single cello line to tremolo figures in all three instruments, and the hexachords are transposed by four semitones to  $W_9/w_9$ . In m. 195 a triplet-sixteenth figure alternates

between instruments, accompanied by a tremolo or harmonics. While this is an abrupt shift there is no new material in m. 195. The triplets were a feature, albeit short-lived, of mm. 192-193 and each triplet only alternates between two pitches without presenting anything that could be construed as a new motive or be carried on to develop one. Thus it is not surprising when the interruption of m. 195 functions in a manner similar to the *Lento* in mm. 193-194; unable to continue as a motivic idea it is quickly abandoned. As mentioned above, Schoenberg acknowledged that new motives may be introduced in a liquidation but they are not retained for long.<sup>25</sup>

In mm. 196-197 the transposition of the hexachords changes to  $W_6/w_6$  and  $Z_6/z_6$ , as indicated on the score in Example 3.11. The order numbers of each hexachord are also notated on Example 3.11 and it is in their presentation that the ongoing development of the waltz is indicated. The violin, playing the pitches of  $w_6$  and the rhythm of motive **C**, is ordered in the same manner as motive **C**:  $\langle 0,2,3,1,4,5 \rangle$ . At the same time the complement,  $W_6$ , is divided between the viola, playing order numbers  $\langle 0,2,3 \rangle$  of motive **A**, and the cello, playing order numbers  $\langle 1,4,5 \rangle$  of motive **B** (as indicated in Table 3.3). In addition, the cello plays the rhythmic motive of eighth notes that was previously associated with motive **B**. The presentation of the  $Z_6$  hexachord in m. 197 is also similar to the waltz when motive **C** is played twice, by the cello and violin. The  $z_6$  hexachord is again divided between motive **A** in the viola and motive **B** in the cello. The above analysis is not intended to imply that mm. 196-197 are heard as a repetition of the waltz. The relationship with the waltz is obscured because the rhythm of motive **A** is significantly altered from the dotted quarter note motive of mm. 184-188 to a melodic

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<sup>25</sup>Schoenberg, *The Musical Idea*, 161.



The passage continues with a third interjection of contrasting material in m. 198 (reproduced in Example 3.12) where all instruments converge for a striking rhythmic unison which becomes a pitch unison in m. 199. Also prominent in the passage is the unprecedented focus on IC5, especially in the unison passage. This is the longest interjection since m. 191 but it also does not present any new material that could be developed as a new theme. Thus it too is quickly abandoned.

When the unison ends in m. 200 there is a shift to a passage with a greatly decreased attack density. To this point in the passage, the music following an interjection has always continued with features of the waltz. In this instance though, the waltz seems to have been unable to persist past the interjection of mm. 198-200. This suggests that the developing liquidation of the waltz has been so extensive that its characteristic features have been weakened to the point that they no longer persist. Measures 197-208 are reproduced in Example 3.12 where it can be seen that the intervals of each instrument gradually decrease in size. There is a final large interval which occurs in all instruments in m. 206 but after this interjection all that remains is a single, repeated pitch in each instrument. At this point, not only have all features of the waltz been liquidated, but so has all pitch and rhythmic motivic material. Thus, at this time we see the end result of a liquidation that has been carried through to its logical conclusion. That is, all remnants of previous musical ideas has been eliminated.

Thus, it is no surprise that m. 208 opens with the introduction of another musical idea. In fact, the music is the opening of the Trio and the start of the recapitulation. The *tremolo* in the violin and viola, and the staccato motive of the cello could be a stark contrast to the previous measures but, while the sudden shift in m. 208 is surprising, it cannot be argued that the entrance

of the recapitulation is a blunt juxtaposition. The preceding liquidation, while not preparing for the recapitulation in the manner of a transition, has made it possible for the waltz to give way to the recapitulation without creating a juxtaposition.

**Example 3.12 – Measures 197-208**

197

199

201

Lento  $\text{♩} = 44$

dim. (p)

dim. (p)

## Example 3.12 – continued

205 *allargando*

This musical system contains measures 205, 206, and 207. It is marked 'allargando'. The score is written for three staves: Treble, Bass, and a third staff (likely Cello/Double Bass). The music features a complex, flowing melodic line in the Treble staff, with the Bass and third staves providing harmonic support through various rhythmic patterns and chords. The tempo is indicated as 'allargando'.

## 208 Part 3

Lento ♩ = 60

This musical system contains measures 208, 209, and 210, labeled 'Part 3'. It is marked 'Lento' with a tempo of 60 beats per minute. The score is written for three staves: Treble, Bass, and a third staff. The music is characterized by a slow, steady pace. The Treble staff features a prominent melodic line with various dynamics including *pp*, *sfpp*, *f*, *ff*, and *p*. The Bass and third staves provide harmonic support with various rhythmic patterns and chords. The system concludes with a double bar line and a repeat sign.

## CHAPTER FOUR.

### SUMMARY AND CONCLUSION

The analysis in the preceding pages has demonstrated the manner in which the formal types of stability and instability are established in the String Trio. This conclusion will provide summaries of the key concepts of this paper. I will also briefly point to additional examples of stability and instability in order to indicate the applicability of this approach to the String Trio in its entirety.

#### Stability

The stable passages are distinctive because their traditional structuring is (fairly) apparent to the listener. The passages chosen for study in Chapter 2 are all in a waltz style and as such, the themes are generally grouped into antecedent-consequent structures. The phrase groupings are indicated by several features which serve to reinforce the stability of their respective passages. For example, a melodic line may be characterized by a series of intervals and the development of that theme, by way of stable processes, can serve to unify the passage. This process is observed in the violin melody of mm. 86-87, the intervals of which are played in retrograde by the viola in mm. 88-89. The processes of retrograde and inversion are often used, not only to provide unity, but to distinguish the onset of a consequent or second phrase group (as the start of the consequent is indicated by the viola's retrograde in m. 88). This approach is particularly effective because it allows for similarities between phrases without the exact repetition of a pitch series. On a smaller scale, motives are created by the systematic derivation of pitches from the (012367) hexachord and are thus characterized by their order number patterns.

The consistent use of order numbers as motives points to the importance of serial derivation for stability in the String Trio. In addition, the transposition level of hexachords is unchanged throughout the antecedent-consequent grouping of each stable passage and, because of this, a change in transposition is one of the initial indicators of the eventual liquidation of the musical idea. Finally, the stable passages were shown to exhibit metric cohesion with the clear projection of a regular metre and hypermetre.

Stability is not restricted to the passages already discussed in this paper and examples of this formal type are observed throughout the String Trio. For example, another period structure occurs in mm. 159-169 (Example 4.1) with the introduction of a lyric violin melody that has much in common with the passages discussed in Chapter 2. The example indicates that the transposition level of the hexachords is consistent throughout the passage:  $W_9$  (violin and viola) and  $w_9$  (cello) begin in m. 159 with a shift to  $x_9/X_9$  in m. 161. The  $W_9/w_9$  ordering returns in m. 163. The violin line opens with a three-note motive utilizing order numbers  $\langle 0,2,5 \rangle$  of  $W_9$  and is characterized by its interval structure  $\langle 1-2 \rangle$ . The motive is repeated three times in mm. 159-160 with octave displacements and a slightly different distribution of the pitches in the third statement. In m. 162 all instruments come to rest on extended durations which marks the only moment in the phrase without motion in at least one instrument (albeit only for the duration of one quarter note).

The melody, consisting of the  $\langle 1-2 \rangle$  motive, is inverted by the cello in m. 163 and it was observed in Chapter 2 that the transfer of the melody to a different instrument indicates the start of a new phrase. The first statement of the motive maintains the durations of the initial motive in m. 159 which suggests that the phrase starting in m. 163 is parallel to the first. The phrase begins

### Example 4.1 – Measures 159-169

Example 4.1 – Measures 159-169

157 rit. -

Wq Wq Wq x9

*ff* *pp ponticello*

*ff* *pp ponticello*

*ff* *pp ponticello*

*p* *p dolce*

161

Wq Wq (p) poco scherzando

Xq

164 x9 y9

(pp) (mp)

(pp) (mp)

Xq Yq

167

(ppp)

(ppp)

ppp

con sordini

by repeating the initial motive, as happened in the first phrase, but after two notes the pitches are changed and the motive breaks down. The distinctive motive does not return and mm. 164-169 proceed with music that is reminiscent of the motive without actually repeating it.

This brief description of the processes and constructions in mm. 159-169 reveals strong similarities to the phrase structures observed in the stable passages of Chapter 2 and points to the fact that this passage is also structured as an antecedent-consequent group. Further analysis would reveal the level to which the motivic and rhythmic activity in this passage supports viewing this example as a stable formal type. In addition, though the phrases at the start of this passage are clearly established, the stability is undermined by its inability to achieve closure (already indicated above by the breakdown of the motive). Instead of reaching a satisfying conclusion, the musical idea is liquidated and thus give way to instability. This passage is recapitulated in m. 282 and, in a manner similar to other recapitulated musical ideas, undergoes significant changes while maintaining a clear relationship to the original theme. The recapitulated passage is also liquidated and its developing liquidation leads to the end of the Trio.

There are also moments of stability that do not strictly align with an antecedent-consequent phrase structure but do have the motivic unity expected in a phrase. The passage that begins Part 2 in m. 133 (Example 4.2) serves as an example. Measures 133-135 are a “metric transition” between the 6/8 of m. 132 and the start of the viola theme in 3/4 in m. 135. The accompaniment voices, violin and cello, provide some rhythmic impetus to the straightforward half note – quarter note pairing in the viola. The viola theme features a stability in its consistent semitone dyads, which group into (0123) tetrachords and (012345) hexachords. This musical idea extends up to m. 141 where it reaches a clear conclusion as indicated by the sustained

### Example 4.2 – Measures 133-141

Part 2

133 A tempo ♩ = 80

arco *p* (F#)

*pp* *p* *p* *pp* *S*

138 *f subito* *ff* *P* *P* *(ff)* *(ff)*

### Instability

Chapter 3 indicated that despite the apparent juxtapositions between contrasting musical ideas, unstable passages actually provide gradual changes between the stable passages through the processes of liquidation and, more rarely, transition. It was also observed, however, that this is not their only function. The analysis revealed that, through the process of developing liquidation, these passages develop musical ideas to an extent that may not be possible within the constraints of an antecedent-consequent grouping. A motive's rhythm, metre, pitch and serial

derivation may be altered in a process that serves to vary, or develop, a musical idea. This development is continued at the same time that characteristic ideas of a theme are being eliminated until the musical idea (which originated in the preceding stable passage) is unrecognizable, or liquidated. During this process, the passage may introduce metric complexities (as suggested in the alternate metric scansion in Chapter 3) and/or new pitch motives which further distort the initial musical idea. Close examination reveals, however, that many of the “new” motives, which seem to disrupt the musical surface, actually continue elements of the predominant musical idea (albeit in a greatly varied or reduced form).

The tendency of the unstable passages to lead towards, or away from, a stable passage does not in any way limit their importance as individual passages. These unstable passages occupy significantly more time than their stable counterparts and develop musical ideas in a different way, and thus they add to the diversity of the piece. It is clear that they are not merely intended to “mark time” until the “real” musical idea (*i.e.* a stable passage) comes along.

One of the longest unstable passages follows the example discussed in Chapter 1 (mm. 12-17) and a significant amount of time passes before a new theme, introduced in m. 52, is developed in the manner characteristic of stability. This passage features several different motivic ideas that are each, in turn, dwelt upon for a short period of time. The most striking of these is the repeated sixteenth note pattern that occurs in mm. 37-40. There are other figures, however, including the extended passage that alternates between double stops of 11 semitones and 1 semitone. The intervals are played in different styles (including tremolo) and with various rhythmic figures (especially in mm. 26-33). A further interesting study is the condensation of this passage in mm. 222-228 of the recapitulation.

There are also several passages that appear to initiate a stable theme but seem unable to pursue it for any length of time. For example, the *Sehr ruhig* in m. 122 begins in the manner of a waltz with the waltz hypermetre (indicated by groupings of two measures of 6/8) as well as the dotted rhythmic figure that was prominent in the waltz from m. 86. There is a clear melody and accompaniment texture but by m. 124 the melody (which has switched to the cello) is altered rhythmically and the waltz theme does not persist. By failing to establish the waltz, this passage is unable to achieve the stability that is clearly intimated.

The recapitulation of individual passages in the String Trio has been studied when the original version of a passage has been introduced. It would, however, be beneficial to pursue a study of the recapitulation and observe the manner in which it relates to the rest of the String Trio. It is clear that the recapitulation does not function in the traditional sense because, rather than resolving the conflict of earlier passages, the recapitulation, at times, seems to introduce an element of juxtaposition. An example was observed in Chapter 3 when the liquidation of the waltz of m. 86 is not recapitulated and instead the first phrase of the waltz is juxtaposed with a contrasting musical idea. Thus, while Chapter 3 argued that juxtaposition is not nearly so prevalent in the String Trio as is commonly argued, it may be that it appears to a greater extent in the recapitulation.

On the whole, however, the String Trio is not a series of discontinuities. While the stable and unstable forms may, initially, appear to be in great contrast to one another, they actually provide unity to the Trio. The stable passages unify because they are structured in a similar manner throughout the Trio. Thus, when one begins, it is easily recognizable. The unstable passages are also approached similarly throughout the Trio even though, by their very nature,

they are significantly different and could very well serve to disrupt the progression of musical ideas. In fact, the unstable passages provide unity by enacting processes of gradual change between the firmly established stable passages. Thus, while it is easily acknowledged that the stable passages exhibit elements of traditional form, it must also be accepted that the unstable passages have a form, and function, which is consistent (to the degree at which it is possible) throughout the Trio. The “surface” discontinuities initially mask this unity, but further analysis reveals its undeniable presence.

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