Metric Modulation and Elliott Carter's *First String Quartet*

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The elevation of rhythm from a position of secondary to primary structural importance is a major contribution of much twentieth-century music. Although it is often not very well understood, one of the better known techniques to have emerged in the area of rhythm is metric modulation, a device perhaps traceable to several composers, but whose full structural and expressive potential was first tapped by Elliott Carter in his <u>First String Quartet</u> (1951). In this study, we shall examine several examples of metric modulation taken from the work. A discussion of how the process fits into the overall structure of the quartet follows.

Definition and Single-line Examples

Metric modulation, briefly defined, is a precise and controlled method of proceeding from one metronomic speed to another. Example la demonstrates the stretching of the metric referential from a quarter note or 4 X 16th-note equivalent in $\frac{2}{4}$ meter to a 5 X 16th-note equivalent in $\frac{10}{15}$ meter. The latter value subsequently becomes the norm of the new quarter note whose length, in effect, is greater than the original quarter note by a ratio of 5:4. The metronomic speed, exhibiting the same ratio, thus "ritards" from ♩=80 to ♩=64 (the greater the pulse value, the lower the metronome marking—and so the inverse relationship of 4/5 with 80/64).

Example 1. Slowing the Pulse.

a.   Rhythm of vln. I, mvt. III, mm. 25-31.

b.   Basic modulation process.

        c. Notation needed to obtain the rhythmic durations
            of mm. 29-31 in the original tempo.

unit is shortened. Quintuplet 16th notes first become
straight 16ths, which are then re-notated as eighth notes.
As a result of these adjustments, the new quarter note has
shrunk to 2/5ths of its original value, and thus the ac-
celerando metronomically from ♩=64 to ♩=160 (the shorter
the pulse value, the higher the metronome marking—and so,
again, the inverse relationship, this time 5/2 with 64/160).
As with the earlier example, transposition of the new rhyth-
mic durations into the old tempo proves difficult and im-
practical.

                Polyphonic Examples of Metric Modulation

    Metric modulations often involve two or more lines of
music, an aspect of the technique which is revealed in one
of the composer's own descriptions: "Say, one part in
triplets will enter against another part in quintuplets and
the quintuplets fade into the background and the triplets
establish a new speed . . . " (each new speed may then func-
tion as a springboard for another such operation).[1] Carter
might very well have been alluding to the passage shown in
Example 3.
    The quintuplets and triplets are, of course, found in the
second and first violins respectively: quintuplet-eighths
within $\frac{2}{4}$ meter, ♩=60; triplet eighths within a superim-
posed $\frac{6}{4}$ meter, ♩=180 (which then become straight eighths
in $\frac{12}{8}$ meter, ♩=180). The 5:9 ratio of characteristic
eighth-note motion and 2:3 ratio of quarter-note motion form
strong bases of conflict. These incompatible frameworks vie

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[1]Elliot Carter, "Shoptalk by an American Composer,"
Musical Quarterly 46 (1960):266-67.

Example 2. Speeding the Pulse.

a.   Rhythm of vln. I, mvt. I, mm. 263-272.
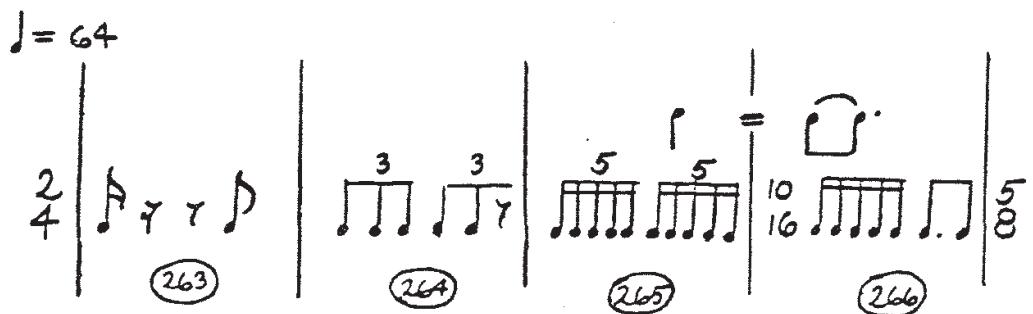
b.   Basic modulation process.
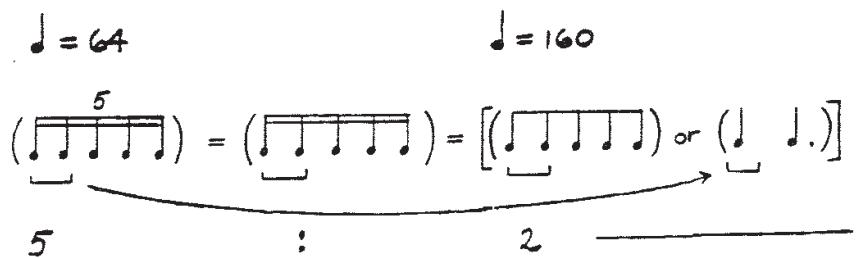
Example 3.   Metric Modulation Accomplished
              Polyphonically in Two Parts,
              Mvt. I, mm. 49-57.

for dominance, with the two parts acting out a kind of mini-
drama.   After a brief "struggle," the quintuplets fade and
the second violin ultimately assimilates the eighth-note
speed of the first violin. (The lower parts, moving evenly
beneath, provide a metric point of reference for both upper
parts, and thus function as a sort of common denominator.)
The example illustrates perfectly Carter's extension (or
elevation) of the principles of counterpoint from a simply
rhythmic level to a metric level.

    A metric modulation involving three parts is shown in Ex-
ample 4. In this passage, a modulation from ♪=100   to
♪ =140 is accomplished through overlapping entries of
progressively faster rhythms, and the usual types of value
equations.   The effect is not so much a "tug of war" (as in

Example 4. Metric Modulation in Three Parts.

the previous example) as it is reminiscent of a footrace in
which runners, though competing, still agree as to the
direction in which they are headed.

Metric Modulation and the Larger Design

    The discussion thus far has focused on separate and
isolated examples of metric modulation, and has demonstrated
the technique as it operates on the micro-structural levels.
Metric modulation also plays a significant role in shaping
and molding the work's larger design or macro-structure.

A visual representation of the quartet's overall form
showing its underlying structure of tempos is shown in Exam-
ple 5. Various departure and return gestures, ranging from
recapitulations within sections to the reprise of the caden-
za at the work's conclusion, can be seen to be supported by
an analogous tempo scheme. Recurring harmonic and textural
relationships also are reinforced through associations with
tempo. And in the Variations, tempo (♩ =120) functions as
a formal delineator, marking the beginning and end of a
large unified structural block of 138 measures. Overall,
the work's metronomic center is M.M. 42, which serves as the
primary referent throughout.

The use and non-use of metric modulation are fundamental
to Carter's overall structure of the work as well. The mid-
dle portion of the work, without metric modulation, assumes
a more stable sense of pulse that contrasts with the metric
fluidity of the outer portions.

In summary, the technique of metric modulation serves the
following musical purposes in Carter's First String Quartet:

1) Metric modulation is a controlled method of
   speeding or slowing the pulse, thus rendering the
   beat supple and elastic.

2) By diversifying metronomic speeds, metric modula-
   tion opens up a variety and range of durational
   values that are either very difficult (see Example
   1c) or impossible to exploit in a fixed tempo, and
   thus makes for a more "chromatic" rhythmic pal-
   ette.

3) Metric modulation, when used polyphonically,
   provides a basis for counterpoint in a more ex-
   tended sense, allowing individual parts to move
   with greater independence and in greater contrast
   to one another.

4) The use and non-use of the technique contribute
   importantly to the work's overall formal defini-
   tion.

5) Metric modulation makes possible the departure and
   return of tempos, which constitute an essential
   and integral part of the work's design (analogous,
   in this respect, to the modulation of keys in
   tonal music).

Example 5.   Overall Form of Carter's First String Quartet
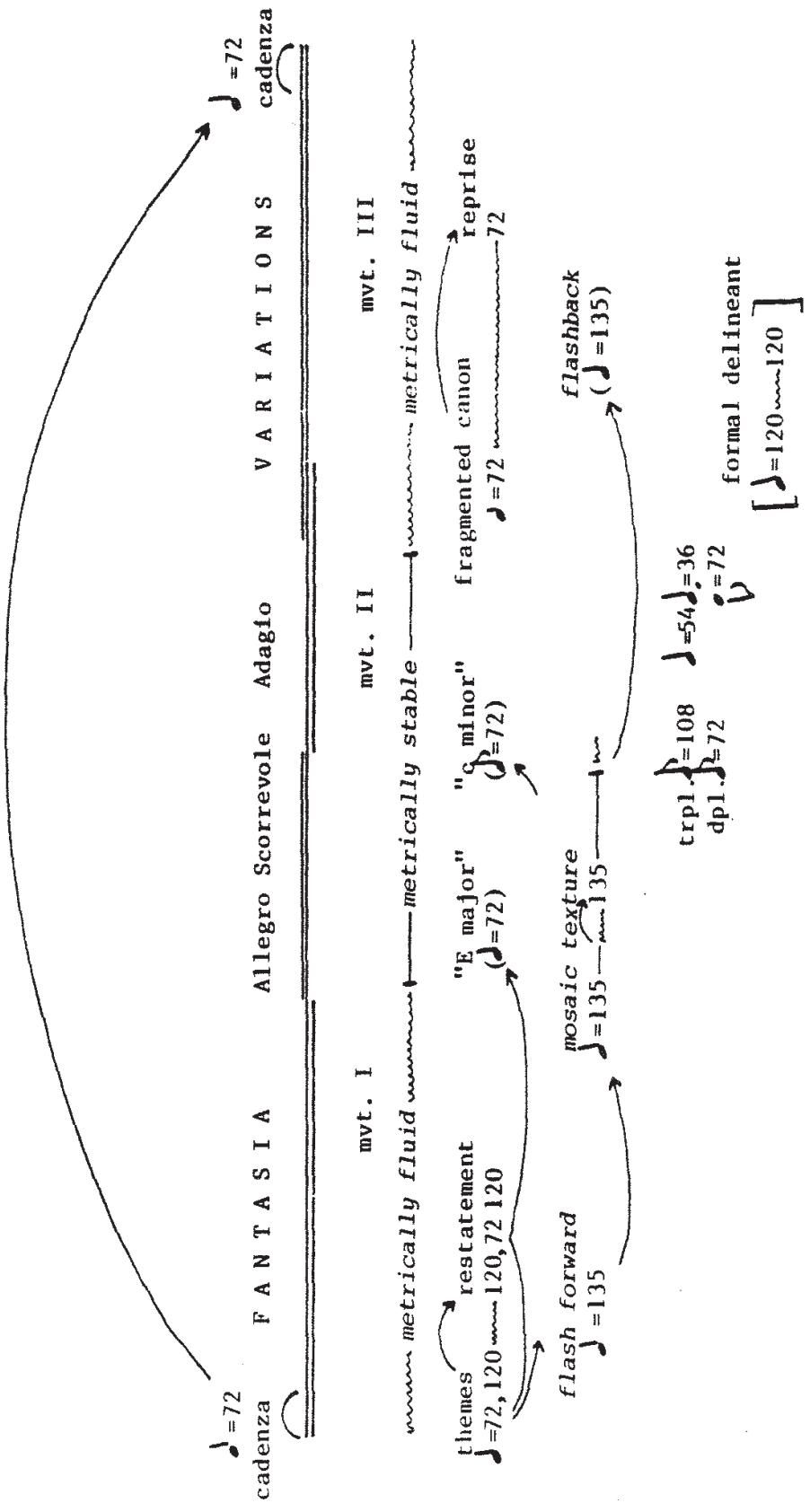
Example 6. Fluctuations of Quarter-Note Speed in the Fantasia.