GLUING TONES

GROUPING IN MUSIC COMPOSITION, PERFORMANCE AND LISTENING

Edited by Johan Sundberg

The figure on the cover is a modified version of figure 9
in W. Jay Dowling's article. It shows the melody *Twinkle, twinkle
little Star* (squares) together with distractors.

The Sense of the Phrase - Compositional Grouping in Music

Gerald Bennett

Grouping is something that composers have gotten quite good at over the centuries. In fact, much of composition, as is the case for any other art, has to do with devising interesting ways of grouping the material with which one has chosen to work. Music shares with spoken language - and sign language - temporal grouping; various mechanisms serve to articulate the stream of sound into segments the perception can deal with. I would like to describe here several different mechanisms of grouping in music, illustrating them with musical examples of several different situations. I shall begin by reviewing techniques for grouping that we all know from the common practice period of classical music, but I will also discuss examples of both early and contemporary music, in order to discover techniques which are not specific to any one style. I intend to argue that while there are certain specific mechanisms for the articulation of music in time, the use of these mechanisms almost always conveys an expressive intent and that hence quantitative measurement of these mechanisms of grouping must always be accompanied by a discussion of the expressive intent at hand. I stress that I am not talking directly about psychological strategies of grouping, but rather of specific techniques composers use when writing their music. I am not a scientist, and I intend to leave any broad conclusions about the mechanisms I demonstrate to the musical acousticians and the psychologists of perception.

Figure 1 recapitulates some of the most important techniques of musical grouping. I shall discuss each point separately. Let us consider melody first.

Sound Example 1 shows synthesized tones of very similar amplitude and equal duration and no musical grouping: There is no acoustic clue whatsoever as to how these ones should be grouped, but so great is our need to organize this flow of sound that only the least suggestion is necessary to let us hear a grouping of four, for instance, or of six. Note how much more difficult it is to hear uneven groupings, like five or seven.

Important factors in composition that assist grouping

- **in melodic context:**
  tonic accent
  high tone accent
  long tone accent
  (metric accent)

- **in harmonic context:**
  key, or consistency of pitch material where key does not apply
  cadence (tension-release archetype; open/closed
  opposition) harmonic rhythm (change of harmony)

- **coherence of texture**

- **development of texture**

- **repetition**

- **simple archetypical patterns of experience**
  (tension-release, increase-decrease, etc.)

- **starting and stopping**

- **reference and expectation**

Figure 1. Compositional factors which aid grouping.

Grouping of a succession of tones like this is done by accentuation. There are several kinds of accent; three of the most important are: tonic accent, high tone accent and long tone accent. **Sound Example 2** gives a straightforward example of tonic accent. Every fifth note is a bit louder and we group into units of five notes each.

Sound Example 3 shows high tone accent. Here the notes are all of similar amplitude, but every fourth note is about a minor third higher than its neighbors. Our perception groups accordingly:

Sound Example 4 shows long tone accent.

Of these examples, only tonic accent is accent as we usually understand the word. In the other two examples, all the notes had very similar amplitudes. Any accent we seem to hear is produced by the perception.

This kind of accentuation works to create opposition, and hence to suggest divisions in the flow of sound. But these are specific aspects of melody. A tone lower than its neighbor tones also creates an opposition, but generally receives less of a perceptual accent than does the high note, unless in the lowest voice. A note shorter than its neighbors also serve to mark a group, but the sense of accent is passed on to the next note.

For the music we know best, that written between 1700 and 1900, we must also mention metric accent, which is the tonic accent given to certain beats in each kind of meter (the first beat in a measure of three, first and third beat in a measure of four, etc.).

Very little music in the western tradition is purely melodic, and so we must also consider harmony. A basic concern of harmony is key, and key is certainly the most important help to grouping, at least in music written between 1600 and 1900. The chord built on the fundamental of a scale is called the tonic and is perceived as the tonal center of the passage using that scale and as a stable sound. The chord built on the fifth note of the scale is called the dominant, is usually followed by the tonic and is perceived as relatively unstable. Most phrases in the common practice period end on either the tonic (closed) or the dominant (open). The contrast between open and closed endings is an essential indication of grouping in all harmonic music.

The primary harmonic event is the cadence, often in the form dominant-tonic. The significance of the cadence is the movement from tension to release. This pattern of tension and release is one of the most important means of indicating grouping, also in situations that have nothing to do with harmony. Most often the movement is from calm to tension to release; the release signals the end of a group. This pattern is one we know well from everyday life and is therefore especially important as a means of grouping.

Harmony too can generate accent by the change from one chord to another. In particular, one tends to hear the tonic as accented in the progression dominant-tonic.

Other principles of grouping of such a general nature as to be valid for all music in our tradition are:

• Coherence: A texture or a pattern remains the same over time.

• Development: One or more aspects of a texture or a pattern change regularly over time.

• Repetition: The repetition of a pattern, phrase, etc. marks that which is repeated as a group.

• Increase/decrease: A few patterns of movement seem archetypical and are important in helping to group. The most important I call increase/decrease. This might refer to melodic movement (rise/fall), dynamics (soft-loud-soft), or any other dimension of music.

• Starting and stopping: In much music where conventional aspects like harmony, meter, melody, etc. are missing, the actual beginning and end of sound is an important indication of how to group.

• Reference and expectation: Music can both refer back to past events, thereby indicating grouping, and create expectation, so that one has an indication of how to group what one is hearing. Although these are very important techniques, I shall not speak explicitly about them here, but I do direct you to Jay Dowling's article in this publication, which deals directly with both these aspects of music perception.

I shall now discuss examples of these grouping techniques. The first example is melodic and dates from the middle of the 16th century. It is the soprano voice of a famous motet, *Sicut cervus*, for four voices by Giovanni Pierluigi da Palestrina.

To begin with, this melody is a good example of both high tone and long tone accent. Palestrina wrote without barlines, and the accents divide the melody into groups of varying length. (I should say again that the "accents" are perceived accents, caused by the higher and longer tones, although it is altogether likely that the singers reading this melody would unconsciously add tonic accents of their own.) But there is another important kind of

Score Example 1. The Cantus (soprano) part of the beginning of the motet
Sicut cervus by Giovanni Pierluigi da Palestrina
(middle of the sixteenth century).

grouping going on here. The small, low-level groups are brought together
into a perceived larger group, precisely a melody, by development in the
pitches and in the movement of the music. Consider the pattern the long
and relatively higher notes make: the slow ascent from the fundamental of
the key to the dominant, then the balancing, but more rapid descent back
to the fundamental. And see, too, how the movement within the melody
becomes more rapid towards the end and then slows down again before the
cadence. Here we see a clear example of the increase/decrease archetype. The
phrase structure of this melody expresses great concern with the intelligibility
of the text and attentiveness to a very anthropomorphic sense of balance in
the melodic line itself.

Here is a second example, some 120 to 130 years older that the first, the
two-part beginning of a motet by Guillaume Dufay, Nuper Rosarum
Flores, written for the dedication of the cathedral at Florence in 1436
(**Sound Example 5**).

At the lowest level we see the same high note and long note grouping
mecha-nisms as in Palestrina, here perhaps emphasized by the melismatic
nature of the music. As with Palestrina, we find similar divisions into
groups of unequal length, distributed differently between the two voices.
The only place where groups in the two voices have the same boundaries is
at cadences, which with their dissonance-consonance pattern move very
strongly from tension to release. A difference in Dufay's music is that the
groups often become progressively and regularly shorter within one phrase.
Although the melodies do not seem to be constructed with the same care
to balanced ascent and descent, we do see both acceleration from the first
to the third phrase and acceleration within some of the phrases. Besides
these similarities, we find here something we would not have found had we
analyzed a longer polyphonic section of the Palestrina motet: a structuring

Score Example 2. The beginning of the motet *Nuper rosarum flores* by
Guillaume Dufay (1436). The brackets and numbers
above the vocal lines show grouping by high tone and
long tone accent. The numbers at the right show the
number of half notes in each phrase.

into larger groups of equal length, that is, grouping by repetition. This
short excerpt from a long composition is a good example of the interplay of
several levels and techniques of grouping. It expresses in its phrase structure
concern for a more abstract order than does Palestrina's motet. We do not
find either the so directly anthropomorphic interest in melodic or rhythmic
balance within the phrases.

Here is an example of other techniques of grouping in a style more
familiar to you: the beginning of the piano sonata in G major KV 283 by
Mozart (**Sound Example 6**).

We have here the first theme and the transition to the second theme of the
first movement. The first theme has three parts; the third part is simply a
repetition of the second. The first part of four measures is divided in two by
the repetition of the rhythm of the right hand and, more importantly, by
the harmonic relationship open-closed (dominant ending, tonic ending).

14

Score Example 3. The beginning of the first movement of the Sonata for Piano KV 283 by Wolfgang Amadéus Mozart (1774).

The second part begins after a texture (and register) change and is also divided into sections, one of four measures (with a cadence on the tonic) and, after another change of texture, one of three measures with a dramatic descent over an octave and a half to the tonic and a stronger cadence form. The end of the first and the beginning of the second section overlap, obscuring somewhat the boundary between the two groups. We find here the same acceleration of movement we found in Palestrina and Dufay. The transition begins after the first real rest in the piece with a change of texture, clearly separating the new motif from its surroundings. The motif is repeated and then repeated three more times, now with no rests and transposed up twice a third instead of a second (i.e. accelerated). In this example, the grouping has both a structural and an expressive function. Clarity of grouping is not necessarily required, some boundaries are clearer than others. Boundaries can be obscured for structural reasons (to create a longer phrase, as in the second part of the theme with its charming and surprising elision) or for expressive reasons (as in the transition, where

15

Wehmut

Score Example 4. The beginning of the song *Wehmut* from the *Liederkreis* op. 39 on poems by Joseph von Eichendorff by Robert Schumann (1840).

Mozart increases our longing for four-measure phrases in order to call our attention more strongly to the second theme and its regular structure).

But what does the grouping of this example express? The grouping here affects the outer shape of the music, which seems to me to make the music rather public, not intimate. The elision expresses playfulness and suppleness, while the exact repetition of the second phrase conveys a rhetorical formality, creating a certain distance between the listener and the music itself.

Let us turn now to an example of more complex grouping in the song *Wehmut* from the *Liederkreis* by Robert Schumann (**Sound Example 7**).

16

Here there are several, often conflicting, markings for grouping within a single phrase. These can best be seen as conflicting accents. The meter suggests a tonic accent on the first beat of every measure. The high tone and long tone accents of the melody suggest accents on the second beat of the second measure and on the first beat of the third and fourth measures. The suspensions in the accompaniment and the harmonic progression (dominant-tonic) suggest accents on the second beat of measure three and on the first beat of measure five. The ascending leap in the middle voice of the accompaniment in every measure suggests further accents. Here the outward phrase structure is much more regular than in the Mozart example: all the phrases in the song are four measures long. But the inner structure of each phrase is much more complex. This way of treating the markings for grouping has no structural function but is purely expressive. Here we find just the opposite situation from Mozart: great outward regularity and extreme inner excitation. This strong contrast and its symbolic significance let us understand the music as intensely personal, highly intimate expression.

Now I would like to discuss five examples of music from the twentieth century. They are of particular interest when thinking about grouping, because many of the techniques associated with earlier music - melody, harmony, regular metrical structure, etc. - take on somewhat different form here. The first example is from the year 1923, the beginning of *Octandre* by Edgard Varèse (**Sound Example 8**).

Obviously, we don't encounter here the subtleties of grouping and phrase that we found in the Schumann example. On the basis of texture we group

Octandre

Score Example 5. The beginning of the first movement of *Octandre* for
Eight Instruments by EdgardVarèse (1923).

18

this passage into two large sections: the solo oboe and the rest. In the music for solo oboe we hear two phrases, in the following music we hear three of similar shape: here it is repetition which helps us to recognize phrases. The first phrase of the oboe we divide into three, or possibly four groups: a first motif, its repetition, then a second, varied repetition and extension with a slight pause between repetition and extension. Note that it is the break in the flow of sound at the end of measure one which is the decisive clue to the original grouping, and nothing in the pitches or their durations; the repetition reinforces our guess about how to group. The next phrase is similarly constructed of three or possibly four groups in the pattern: motif, varied repetition, second repetition and extension. The crescendo at the end leaves the phrase open, as though it would end on the dominant, and thus leads to the next large group. The three groups in the second part are articulated by their similar texture (held chord with large dynamic change); the ear takes its clues for grouping from the most prominent instrument, here the trumpet, although I suspect that Varèse counted on the high g-sharp of the flute to unify the two groups. The two short duos in different tessituras in the third group give a further articulation, the crescendo at the very end of the third group leads to the next section. This example is interesting, because it shows how general and undifferentiated the means for marking groups can become in the absence of a clear and strictly followed musical syntax. The expressiveness of this passage depends on things like the rhapsodic structure of the oboe solo with its many repetitions, the similarity to the oboe section in the structure of the ensemble section, the contrast between the solo oboe and the entire ensemble, the contrast in dynamics in the ensemble section and on the magic and evocative power of the pitches of the tutti chords. Most importantly probably, the expenditure of physical energy on the part of the players contributes greatly both to understanding how to group the music and to its expressive force. This is not a music where subtly conflicting signals about grouping lead us into an intimate subjective realm. The hardiness of the grouping mechanisms shows us a mysterious but nonetheless objective music of great physical intensity.

The next example is from the year 1970 and is very different. It is the beginning of the 13th String Quartet in b-flat minor by Dmitri Shostakovich (**Sound Example 9**).

String Quartet No. 13

Score Example 6. The beginning of the first movement of the *String Quartet No. 13* in *b-flat minor* op. 138 by Dmitri Shostakovich (1970).

I have played quite a long section, the entire first theme, in order to show something of the complexity of the grouping in this piece. The opening statement in the viola is clear enough: the rests, similarity of motif and phrasing, the return to the note b-flat and perhaps the aab form as well mark very clearly the grouping the composer intended. From rehearsal number 1 on, however, there is much that is unclear about the grouping. Cello and first violin play a melody clearly related to the viola's at the beginning, which cadences perhaps in the fourth measure after 1 (long note), or perhaps two measures later (lowest note), overlapping with the beginning of the next phrase. This phrase has its melody in second violin and viola. Like the viola solo, it has an aab structure with a clear cadence at 2 (long note). But what a cadence, holding the half-tone dissonance for nine beats! Four measures of transition lead to a reprise in first violin and cello of the opening melody, with the descending half-tone repeated at the end of the first two phrases. The second violin and viola continue the minor thirds of the measures before 2, first from d-flat to f-flat, then from b-flat to d-flat. In its final phrase alone, the first violin echoes the viola solo, but instead of slowing its movement to cadence on b-flat it speeds up and turns to d-flat to prepare the entrance at rehearsal number 4.

In this example many of the clues to grouping are obscured: the unclear ending of the melody after 1, the cadence at 2 with sharp dissonance instead of release of tension, the second violin and viola 3 measures before 3, which continue their accompaniment figure across the return of the first theme.

In comparison, Schumann's obscuring of group boundaries in the *Wehmut* seems quite harmless. I find this way of dealing with formal grouping extremely expressive. The main formal purpose of the obscuring of boundaries is to create longer sections. In this slow tempo, the relatively seamless music between the two solos is extraordinarily long in absolute time. This unusual length creates the ever stronger expectation that a phrase will finally be closed. The avoidance of clear boundaries also has a symbolic meaning which I will not try to paraphrase, but in which waiting and unresolved tension certainly play a role. Of course, other aspects of the music, particularly the harsh bareness of the two-voice texture with its stark octave doubling, the constant minor seconds used both melodically and harmonically and the insistant, hopeless, empty movement within the minor third are important in defining the expressive content of the music, but their effect would not be so strong if the phrasing of the music allowed one to relax between numbers 2 and 4. If I have emphasized the dissociative aspects of grouping in this example, it was to show that clear grouping is not necessary in good music. It is important however to point out that the obscuring of grouping boundaries presupposes the expectation that boundaries will be set. In this example the underlying formal movement is quite evident to analysis; its clarity is the prerequisite which allows the obscuring of boundaries to work at all.

Finally, I would like to play you three examples of electroacoustic music. Because most traditional compositional criteria do not apply to these pieces, they are particularly interesting in a discussion of grouping. The first example is both the oldest and the most radical, *Williams Mix* by John Cage, from the year 1952 (**Sound Example 10**). Here the composer has taken care to make grouping impossible, except when the sound actually stops for an instant.

This music is made of eight layers of sound, each of which consists of short fragments of sound chosen at random. The texture is so dense, and the fragments so short, that it is impossible to divide sections into shorter groups than those between two pauses in the sound itself. What effect does this have? By making symbolic interpretation impossible by avoiding traditional means of grouping, Cage turns our perception inwards towards the sounds themselves and not towards any relationships between them or to any meanings they might have.

The next example is by Pierre Schaeffer, the founder of *musique concrète*. It is taken from the piece *Etude aux sons animés* from the year 1958 (**Sound Example 11**).

This excerpt has three parts: the first is a kind of "curtain" that announces a new section, the second is a two-part episode, the third is the "curtain" again. The "curtain" consists of two main elements: a grainy tone, and a sound that seems to be the quick rubbing of a cymbal, perhaps with a metal rod. It ends with a crescendo of the cymbal in just the same gesture we heard in *Octandre* by Varèse. In the first part of the episode the sound of the cymbal is prolonged with continuous changes of pitch. Towards the end of the first part, we hear two single percussive sounds or groups of sounds. The first part is grouped together by a single tone having the same pitch as the cymbal from the "curtain"; its gradual disappearance signal the end of the first part. The second part continues the glissando idea of the first but uses the "rubbed" sound quality from the "curtain", along with other percussive sounds. Here too a single pitched sound leads directly to the repetition of the "curtain".

In this example, three factors from the list in Figure 1 determine grouping: coherence, development and the use of characteristic dynamic gestures. Coherence is given by the ostinato (the long, high-pitched tones in the episode) and by the use of only two timbres. The development of the section takes place in the realm of timbre, as Schaeffer finds ever new variations on both the grainy and the rubbed sounds of the "curtain". The characteristic dynamic gestures (in particular the fading in and out of the ostinati and the crescendi at the end of the first "curtain" and the episode) are archetypical movements we know not only from other musical contexts but also from everyday life. The remarkable thing about this example is how timbre plays a major structural role in defining groups. The grouping mechanisms are quite "classical" and straightforward, even if the materials on which they operate are strange to us. There is no conflict of signals here, no non-fulfillment of expectation, and while the piece seems to me quite expressive, the directness of the grouping makes for a very different expressiveness than in the Schumann song or the Shostakovich quartet.

The last example I would like to discuss is taken from the beginning of Region IV of the piece for tape *Hymnen* by Karlheinz Stockhausen from the years 1966/67 (**Sound Example 12**). In this example there are fragments

from the Swiss national hymn sung by a choir over a background of very slowly moving sound. The Swiss hymn becomes more and more distorted as the piece goes on. This example is a bit longer than the others I have played, although I have shortened it considerably from its original form.

It seems to me very difficult to speak about grouping in this music. The time scale for the passage is given by the sound in the background: apparently aimless at first, it soon begins to descend, and every new entrance of background music will turn out to descend in a very slow, never-ending glissando. There is no help for grouping here; there are entrances of new music, but nothing in the background ever finishes. Only the fragments of the Swiss hymn, progressively more distorted, are bounded "on both sides", so to speak, and they too eventually become endless as later entrances are extended indefinitely, become part of the background and merge with the noise of the universe. Much of the poetry of this passage comes from its avoidance of grouping, and the techniques used by Stockhausen serve a very precise compositional and expressive intent: clear entrances, unclear endings, movement from foreground to background, continuous descent, progressive distortion, all of these have strong symbolic connotation. In the absence of grouping - we saw this in the Cage example - one's attention is directed to the sounds themselves, but if Cage took pains to strip the sounds of *Williams Mix* of sentimental or emotional content, Stockhausen does just the contrary, composing seemingly mechanical sounds of limited bandwidth and quite threatening character. Unable to group these sounds meaningfully, we are exposed to their full symbolic and expressive power.

The music's threatening character is certainly in part dependent on the sounds themselves with their narrow bandwidths and the suggestion of repressed energy. But what does the grouping express? The constant non-fulfillment of expectation casts a pall of desperation over this music. Not just the non-fulfillment itself is important - we have seen that in other examples. The continual impossibility of grouping is very distressing: things become boundless, and boundless things are frightening and worrisome. It would be interesting to reflect on the difference between the Shostakovich and the Stockhausen examples in terms of the non-fulfillment expressed in each. I personally find the Shostakovich more expressive, because there is fulfillment, but the "resolutions" are always distorted. I

24

find the distortion more disturbing than the rather crude destructiveness of the Stockhausen.

In conclusion, I would like to stress the importance of conflicting signals about grouping and of the non-fulfillment of expectation about grouping. At the very least, these techniques make us aware of tensions and activity not confined exclusively to the aesthetic realm. Obscured grouping alerts us as well to other expressive aspects of music. We all know what a complex and often nefarious place the world is; the complexity of grouping in most contemporary music only reflects the complexity of the world from which it arose.

I have tried to show very different examples of how composers deal with grouping in their music. Although there are certain basic techniques of creating phrases, grouping in music is never without expressive intent and content. As we continue our research into how grouping works - many of you by examining music, others of us by writing new music - it seems to me essential to listen with great attentiveness to the sense the phrases make.