

GUIDE TO CODING CANTOMETRICS

Line 1. THE SOCIAL ORGANIZATION OF THE VOCAL GROUP

This line describes the *social* organization of the singing group. Here you will find variations of “call and response.” Two basic elements of group organization are considered:

- 1) Prominence of solo or leader’s part
- 2) Type of group organization

The scale is one of increasingly integrated social relations, from solo to interlock.

Coding Instructions

In coding for a predominant leading voice, listen for one or more of these cues:

- A leader’s voice may be heard at the beginnings of a song and of sections.
- The leader may sing more loudly, more frequently, or more rhythmically.
- The leader may employ mannerisms that set his or her voice apart.
- The leader may be heard to urge on the other performers in various ways.

1. No singers.

2. One solo singer, whether or not accompanied by instruments.

4. One solo singer after another. Two or more singers alternate in singing a melody, or split the melody between them in some way. Only one singer is heard at a time.

Double code in the following situations:

- If any two singers’ parts overlap consistently, code **10 (overlap: leader-group)** and **4**.
- If two or more singers alternate in leading a chorus, code **4** and the appropriate choral situation (see below).
- If two singers both alternate and sing together, code **4** and **8 (alt. leader-group)** or **11 (overlap alt.: group-leader)** (see below).

Points 5 and 6 represent types of **social unison**, a simply organized group performance in which all participants sing the same rhythm and the same text throughout the performance. Everyone sings at the same time. There is no alternation of parts. Although there may be some melodic and rhythmic deviations, the general effect is one of coordinated unity.

5. Social unison with predominant leader. A single predominant voice—a leader—stands out above the general effect of social unison. The leader’s voice is usually louder

and more forceful than the others. Sometimes the leader imitates phrases or other parts of the melody. Sometimes the leader seems to spur the group on. In general, a predominant part is louder, more elaborate, more active, or longer than the others.

6. Social unison with group predominant. No predominant lead voice is steadily heard over the social unison. Sometimes a leader can be heard briefly above the group at beginnings of sections, but as soon as the group joins in, the leader's voice is submerged.

7. Diffuse/individualized group. A diffuse, individualized group performance is rhythmically and/or melodically diffuse, such that in extreme cases the singers do not seem to be aware of one another at all. Two types of casually coordinated performances are coded here:

- The impression is of a group of individuals singing totally different melodies or rhythms at the same time.
- All singers may follow the broad outlines of the melody or rhythm, but diverge radically on most details. The general impression is one of heterogeneity. This effect may actually be intentional and cultivated, the result of meticulous rehearsal and conscious control.
- In some cases, one voice may stand out among the rest as leader, but this will not affect the rating *unless* a clearly **antiphonal** relationship is involved (see below).
- If antiphony is combined with this kind of heterogeneous group activity, code **7** and either **8 (alt. ldr-grp)**, **10 (overlap: ldr-grp)**, **11**, or **12**.
- The total effect may be so complex that it is difficult or impossible to judge coordination. Certain kinds of performances produce a diffuse effect but show evidence, in detail, of close coordination. When uncertain if the performance is uncoordinated *or* highly coordinated, select *both* **7 (ind. group)** and **13 (interlock)** (see below).

Points 8 through 13 represent types of **antiphony**:

8. Simple alternation: leader-group. Situations in which there is alternation between a solo voice and a chorus with a perceptible, if sometimes very slight, pause between the two parts.

- The group may repeat the leader's part or respond with new material.
- The leader may join the chorus—or indeed may *form* the chorus by singing with one other person.
- In some cases, there may be regular alternation.
- Or, the leader may sing only once, with the chorus singing the remainder of the

piece.

- In all cases, the leader must sing at least one complete phrase or sub-phrase alone. If, instead, the leader begins and the other singers drift in on the same phrase, code **5 (soc. unison: leader)** or **6 (soc. unison: group)**, rather than **8**. If there is occasional overlapping or if one part enters right on top of the “cutoff” of the other part, code both **8** and **10** or **11**.

9. Simple alternation: group-group. Two groups of two or more singers interact as described for **7**, above. The same rules for double coding apply.

10. Overlapping alternation: leader-group. A more integrated alternation of leader and chorus, whose parts overlap so that one begins before the other ends. In extreme cases the chorus may also be heard backing the leader during his or her own part. However, the leader is still predominant; his or her part is longer than that of the group and often more elaborate. The group’s activity supports and contrasts with the leader’s part.

11. Overlapping alternation: group-leader. This is the same as **10**, except that the group predominates rather than the leader. Although it may sometimes support the leader, the group is very active, and sings more than half of the time.

12. Overlapping alternation: group-group. Two or more groups overlap as in **10**. In those rare cases where the groups are radically different in size (for example, two singers versus 20), **12** is still coded, even though the smaller group may give the impression of leading the larger.

13. Interlock. A group in which several voices overlap in a rhythmically coordinated relationship. Often there is no clear leading part; all seem about equally important. Although some singers may be duplicating another part at the octave or in unison, the general impression is of a group of individuals, each with his or her own part, interacting in such a way as to create a homogeneous texture. In doubtful cases, double code **7 (ind. group)** and **13**. Double code also:

- When an individual voice can be heard in alternation with the rest of the group, code both **13** and **8 (alt. ldr-grp)**, **10 (overlap: ldr-grp)**, or **11 (overlap alt.: grp-ldr)**, whichever is most appropriate.
- When a situation is so complex that one cannot distinguish whether the singers are really coordinated or not, code both **7** and **13** (see above).

Line 2. RELATIONSHIP OF ORCHESTRA TO VOCAL PARTS

The term “orchestra” refers to the performers of any non-vocal sounds heard on the record, whether they be body-produced (clapping, stamping) or object-produced by anything from two sticks to a symphony orchestra.

Coding Instructions

1. Non-occurrence. No accompaniment.

2. A small orchestra (1-3 players) accompanying the vocal part and subordinate to it. One or more of the instruments may perform the melody.

3. A large orchestra (4+ players) in the same relationship as 2.

5. A large or small orchestra predominant over the sung part. The orchestra’s part takes up more time and/or is considerably louder than the sung part.

6. The orchestra (large or small) plays interludes between passages. It is never heard simultaneously with the vocal part.

8. A small orchestra (1-3 players) that seems unrelated or only casually related to the vocal part. The effect resembles that described under 7 (**ind. group**) on Line 1, and is the result, usually, of some absence of rhythmic coordination between instruments and voices.

A number of situations are coded here:

- The instruments may be out of phase with the singers or slightly faster or slower, creating a blurring effect.
- They may alternately trail behind the singers and speed ahead of them.
- They may play the melody of the vocal part, but in an individualized manner, as in certain types of heterophony.
- The sung part may be in free rhythm while the accompaniment adheres to strict rhythm or vice versa.
- The instruments may play long, drawn-out “drone” notes, with no rhythmic shape, as a background to a rhythmically active voice part.
- In the main, the singers may be rhythmically in sync with the instruments, but the coordination is so subtle as to be missed by the untrained listener. The crucial moments of the voice part—beginnings and ends of phrases, melodic peaks, strong accents—do not coincide with the rhythmic patterns of the accompaniment.

Double coding may be necessary when some of the instruments coordinate well with the singers and others do not.

9. A large orchestra (4+ players) that seems unrelated or only casually related to the vocal part. See 8 (above) for parameters.

12. A small orchestra (1-3 players) in complementary relationship to singer(s). The instruments are basically coordinated with and subordinate to the vocal part, but provide more than a mere background for the voices, as in **2 (small orch)** and **3 (large orch)**. Here again a number of situations are coded:

- The orchestra may comment on the vocal part in a significant way.
- Some of the instruments may pick up the melody from the voices and take the foreground temporarily.
- In other cases, the orchestra plays a highly contrastive but coordinated foil for the voices, the instruments providing a large share of the total musical interest, but on a distinctly different plane than that of the singers.

To summarize, the effect of this is of continuous interplay between voices and orchestra or of two distinct musical planes (voice and orchestra) linked by a strong rhythmic bond. In some cases, the relationship between singers and orchestra will be so complex or ambiguous that it is difficult to tell whether or not there is real coordination between them, so it may be necessary to code both **8 (small unrelated orch)** and **12**.

13. A large orchestra (4+ players) in complementary relationship to singer(s). See 12 (above) for parameters.

Line 3. SOCIAL ORGANIZATION OF THE ORCHESTRA

Line 3 and Line 1 (Social Organization of the Vocal Group) correspond, but the social relationships between the orchestra's parts are more difficult to identify—for example, it is often hard to distinguish between types of overlap. In many cases, two or more coding situations may be equally important, requiring multiple coding. The scale is one of increasing integration, from solo to interlock.

Coding Instructions (See Line 1 for further instructions.)

1. Non-occurrence. No instruments.

2. One solo instrument. An accompaniment or a solo on one instrument.

4. Series of solos. One instrumental solo after another.

5. Social unison with leader predominant. Other instruments are subordinate to the leader, playing the same tune in the same way or in simple accompanying parts.

6. Social unison with no predominant instrument. Unison performances in which no single instrument takes the lead, and performances in which there is a simple accompanying relationship between the leading instrument and the other instrument(s).

7. Diffuse/individualized relationship, leader predominant. Similar to **7 (ind./var. group)** in Line 1, but applied to the relationships among the instruments of the orchestra. Single lead instrument is predominant.

8. Diffuse/individualized relationship, group predominant. Similar to **7 (ind./var. group)** in Line 1, but applied to the relationships among the instruments of the orchestra. Either the leader is subordinate to the group or leadership shifts from one instrument to another.

9. Simple alternation: leader-group. A simple antiphonal relationship between a single lead instrument and an orchestra (see 8 Line 1 alt. ldr-grp).

10. Simple alternation: group-group. An orchestra divided into two or more parts with an antiphonal relationship between them.

11. Overlapping alternation: leader-group. Alternation between a single instrument and a group, but with overlap (see 10, Line 1 overlap: ldr-grp).

12. Overlapping alternation: group-leader. Alternation between a single instrument and a group with no one instrument in the foreground more often than the others.

13. Overlapping alternation: group-group. The orchestra is divided into two or more groups, each of which acts as a unit, with significant overlap between them, or in an **interlocking** relationship, as described in Line 1 (13).

Line 4. MUSICAL ORGANIZATION OF THE VOCAL PART

The musical coordination amongst the singers in a group considers both melodic and rhythmic elements.

Coding Instructions

1. Two or more singers who are totally unrelated musically. Each singer has their own part and goes their own way, although they sing simultaneously.

4. Monophony. Only one voice is heard at a time.

7. Unison. Two or more voices singing at the same melody in unison or octaves, and conforming to the same rhythmic pattern.

10. Heterophony. Each voice sings the same melody in a slightly different manner.

The variation is usually *rhythmic*, with some voices trailing behind, others pushing forward, or with some voices more rhythmically active than others.

- Some melodic individuality, but temporary and usually inconsistent.
- Some voices deliver a more embellished or rhythmically varied melodic line, against others that are less embellished and more straightforward, but all sing essentially the same melody.
- Simultaneous combinations of different tones occur irregularly due to the variation of melodic detail in some voices. In such cases, **10** can still be coded. *Polyphony is reserved for songs in which such chords recur consistently.*

13. Polyphony. The use of simultaneously produced intervals other than unison or the octave. (Line 22 gives six categories of polyphony.) Two-part intervals of this kind are considered polyphony, as well as harmonies of greater complexity. Simultaneously produced intervals can also occur in **Heterophony**, but irregularly. Polyphony would be coded *only* if one of the following situations is perceived:

- When simultaneously produced intervals other than unison or the octave are heard often enough and it is obvious that “part singing” is taking place.
- When simultaneously produced intervals other than unison or the octave are infrequent, choose polyphony only if they recur in a consistent way.
- In intermediate cases, the length of the simultaneously produced intervals other than unison or the octave is relevant. If they tend to last about as long as the important melody notes, it is likely that true polyphony exists. If they are ephemeral, the case is probably heterophony.

Line 5. TONAL BLEND OF THE VOCAL GROUP

Both diffuse and cohesive sounds are pleasing within a given aesthetic. Much tonal blend depends upon wide, clear voicing and the relative absence of vocal noise and ornamentation. In contrast, with tonal independence, no individual yields to another, producing a noisy effect. Intermediate blend is often a reedy unison in which individual voices are heard.

Coding Instructions

The scale permits a judgment of the degree of vocal blend in five steps, from little too much *sonority*, or from maximal *tonal individuation* to *tonal unity*.

1. Solo.

4. Minimal Blend (Very individualized). Singers do not attempt to match one another in tone. Individual voices stand out, and the effect can be strident or tumultuous, often producing a rich and interesting texture.

7. Medium Blend (Rather individualized). Some tonal matching occurs, but individual voices may still be heard.

10. Significant Blend (Unified blend). The group sounds resonant as a whole, with some stridence.

13. Maximal blend. The singers match one another's tone in such a way as to present the effect of a single tone quality. Any stridency is the result of harmonic dissonance rather than blend. The total effect is highly resonant, clear, and unified.

Line 6. RHYTHMIC COORDINATION OF THE VOCAL GROUP

The degree of rhythmic coordination between members of the singing group depends on the degree to which its members coordinate their attacks and releases. Rhythmic blend is considered maximal when attacks and releases are precisely coordinated. If movement from note to note is staggered, then rhythmic blend is considered minimal. Both effects are aesthetically grounded, powerful, and pleasing.

Coding Instructions

Observe how the members of the singing group move together rhythmically:

- If all attacks and releases are precisely coordinated, rhythmic blend is considered maximal.
- If individual voices are discernible on all attacks, and movement from note to note is always inconsistent, rhythmic blend is considered minimal.

The degree of rhythmic coordination among singers is rated on a five-point scale.

1. Solo.

4. Minimal rhythmic coordination. An individualized, rhythmically asynchronous performance.

7. Moderate rhythmic coordination. Some degree of rhythmic coordination, still considerably individualized.

10. Unified rhythmic coordination. Attacks and releases are generally coordinated but not precisely so.

13. Maximal rhythmic coordination. Precise coordination at every rhythmic level.

Line 7. MUSICAL ORGANIZATION OF THE ORCHESTRA

Overall musical coordination amongst members of the orchestra, taking both melodic and rhythmic elements into account. Here, *polyrhythm* is treated as a type of polyphony, as each part is independent.

The instrumental codings of Cantometrics are broader than those for voices. The possible combinations are many and more difficult to distinguish. For this reason, instrumental parameters tend to be less useful and somewhat confusing to code, so a simplifying compromise was reached.

Coding Instructions

1. Non-occurrence.

- No instruments.
- Two or more instruments perceived to be totally asynchronous.

4. **Monophony.** One instrument playing one note at a time, or in octaves.

7. Unison.

- A group of instruments playing the same melody in unison or in octaves.
- An instrumental solo with simple percussion accompaniment—drum, rattle, sticks, clapping, etc.
- Any untuned percussion ensemble unless playing in polyrhythm, in which case, code 13 (Polyrhythm) (see Point 5).

10. **Heterophony.** Each instrument plays the same melody in a slightly different manner. The variation is usually rhythmic, with some instruments trailing behind, others pushing forward; or with some instruments more rhythmically active than others.

- Some melodic individuality, but it is temporary and usually inconsistent.
- Some instruments deliver a more embellished or rhythmically varied melodic line against others that are less embellished and more straightforward, but all play essentially the same melody.
- Simultaneous combinations of different tones occur irregularly, due to the variation of melodic detail in some instruments. In such cases, **Heterophony** would still be coded. **Polyphony** (defined below) is reserved for songs in which such simultaneously produced intervals other than unison or the octave recur consistently.

13. **Polyphony or polyrhythm.** The use of simultaneously produced intervals other than unison or the octave. Two-part intervals of this kind are considered polyphony, as well as harmonies of greater complexity. Code here for the presence of harmony of any kind in

the accompaniment, whether produced by an ensemble or on a single instrument, such as a guitar. At this point also, code cases of two or more percussion instruments playing in polyrhythm—simultaneously playing two or more different rhythms that are not perceived as deriving from one another, or as simple manifestations of the same meter.²

Line 8. TONAL BLEND OF THE ORCHESTRA

The concept of tonal blend applies to orchestras differently than to voices. An orchestra composed of several different kinds of instruments can rarely achieve the same degree of tonal unity as a chorus of voices. Consequently, the measure of blend for orchestras is not uniformity of timbre, but rather the overall sonority of the ensemble.

- When the instruments are in tune with one another and play in a similar manner so as to reinforce and maintain a consistent sonority, significant blend can be coded.
- Orchestras consisting exclusively of untuned percussion instruments are a special case since it is difficult to assess their overall sonority. If an ensemble of this type consists of instruments of the same kind only, such as clapping ensembles, or a group of people striking axes against wood, maximum blend is automatically coded. If untuned percussion instruments of different types are used, the criterion is the degree to which they tend to sound as though they were of the same type.
- If the entire “orchestra” consists of a single instrument, **non-occurrence (1)** can be coded on this line and the following one. This holds true even when an instrument is polyphonic, such as the guitar or the piano, in which there is an element of blend between individual strings or other components.

Coding Instructions

1. Non-occurrence. No group. Only one instrument in the ensemble, or no instruments at all.

4. Minimal blend. Little or no overall sonority. Instruments contrast in tone quality and do not reinforce one another at all.

7. Medium blend.

10. Significant blend.

13. Maximal blend. Total effect is highly sonorous.

Line 9. RHYTHMIC COORDINATION OF THE ORCHESTRA

Rates the degree of rhythmic coordination between members of the orchestra. If all attacks and releases are precisely coordinated, rhythmic blend is considered maximal. If, on the other hand, movements from note to note are invariably asynchronous, rhythmic blend is considered minimal.

Coding Instructions

1. Non-occurrence. No instruments, or no ensemble—one instrument only.

4. Minimal rhythmic coordination. The members of a group share a rhythmic pattern that is so individualized that the effect is extremely asynchronous.

7. Moderate rhythmic coordination. A group that plays together on the beat, or follows the same rhythmic pattern or patterns, in a cohesive fashion.

10. Unified rhythmic coordination. There is clear-cut coordination of attack and release on the beat.

13. Maximal or highly unified rhythmic coordination. The orchestra is tightly linked together rhythmically.

Line 10. REPETITION OF TEXT

Listening to the text as it is performed, consider the degree of repetition in the text without considering the meaning of the words. Knowledge of the language of the text has no bearing on this rating. Instead, make a judgment about the proportion of the text in the whole song that seems to be repeated, or which consists of words that have no lexical meaning.

- Repetition of passages of text in the form of refrains, choruses, burdens, responses, or lines sung over several times to fill out a poetic form occur frequently in many song styles. The chorus part is counted along with the leader's part. For example, if a chorus always sings the same line in response to a fresh line from the leader, this case would be coded **7 (half-repetition)**.
- Words and vocalized sounds with no lexical meaning include a multitude of phenomena extremely common in song: vocal segregates, non-lexical syllables and words, babbling, ululating, animal imitations, shouts, cries, moans, laughter, sobbing, grunting, and the like. If such material appears in a song it usually recurs again and again, and is thus an important factor in rating repetitiousness.
- Although accurate judgments can't always be made about which of these phenomena appears in a song, attentive listeners can calculate the proportion of the time repetition *and/or* non-lexical utterances takes up in the entire song. Such material often occurs in formally patterned ways and usually stands out in clear contrast to passages of new text.

Coding Instructions

1. Little or no repetition—wordy. A continuous stream of dissimilar sung syllables, words, and phrases, with little or no repetition or use of non-lexical utterances. In such songs—epics, ballads, songs of prayer and supplication, and much of Western and Eurasian song—text is of paramount importance.

4. Some repetition. Some repetition and/or the use of non-lexical utterances—about one fourth repeated text.

7. Half repetition. A substantial amount of repetition and/or non-lexical utterances that more or less equals the flow of unpeated words.

10. Quite repetitious. Considerably more than half (about two-thirds) of the sung performance is accounted for by repetition and/or non-lexical utterances.

13. Extreme repetition. The text seems to be almost entirely composed of repetition of some kind and/or non-lexical utterances.

See **Notes on Coding Rhythm (Appendix I)** for further guidance on coding rhythmic lines 11-14.

Line 11. OVERALL RHYTHM: VOCAL

In most musical styles, the performer or performers employ a single, overall rhythmic “ground plan,” which serves as a point of reference for the infinite variety of rhythmic detail possible within the scheme. Although many such overall formats are possible, they have been divided here into five general categories. The categories for this measure apply to the overall rhythm of the voices. In order to code the instrumental part, refer to Line 13.

Coding Instructions

1. Non-occurrence. No singers.

3. One-beat rhythm. A series of equally accented single notes of about the same length.

6. Simple meter. One simple meter—duple, triple, “simple,” or compound—runs through the whole song. Thus, if the entire song is in 4/4, 3/4, 6/8, 9/8, 12/8, or any other similar meter, code **6**.

- A song in **simple meter** should *not* be coded as **irregular (11)** merely because it is sung with some degree of rhythmic freedom. For example, a performer often loses the beat during the pause at the end of a phrase only to pick it up again with the beginning of the next phrase. An irregular pause of this type is coded in **Line 26** as **rubato**, unless all such pauses in a performance are of the same length. In the latter case, code **11 (irregular)**.
- **6** is *not* coded if the accents within the measure are unevenly distributed in a consistent manner throughout the song (for example, 9/8 divided into 2/8, 2/8, 2/8, 3/8).

9. Complex meter. Here, as with **6 (simple meter)**, one meter prevails throughout the song. In **9**, however, the measure cannot be evenly divided by two or three to form subunits of two or three beats each. Thus, **9** includes such meters as 5/4, 7/8, 11/16, etc.

- When the accent pattern within the measure is distributed unevenly but consistently throughout the song, meters such as 9/8 and 12/8, although divisible by two or three, are also coded **9**. A subdivision of 12/8, for example, into 3/8, 2/8,

3/8, 2/8, 2/8, is coded **9**. A subdivision of the same 12/8 into the more usual 3/8, 3/8, 3/8, 3/8 is coded **6**.

11. Irregular meter. No single meter prevails throughout. A song that is basically in 3/4, but has one or more measures in 2/4, is coded **11**, as well as a song in which the meter shifts continually from measure to measure (for example, 3/4, 2/4, 3/4, 3/4, 5/4, 3/2, etc.).

- Meter changes involving **hemiola effects** only are *not* considered irregular.

13. Parlando rubato. Free rhythm, in which no regularly recurring beat can be distinguished, is often close to speech in general effect. Accents and rhythmic patterns are grouped in meaningful ways, but without reference to a regular division of time into steady beats.

Line 12. RHYTHMIC RELATIONSHIP WITHIN THE VOCAL GROUP

Singing groups establish their rhythmic activity in a number of ways. In some cases, all singers or parts in a chorus may stick to the main rhythm. In others, there may be one or more contrasting rhythmic parts. This line provides seven descriptive categories for the various types of rhythmic relationships that link a group together within one of the overall metrical patterns already coded in **Line 11**.

Coding Instructions

1. Non-patterned. No rhythmic coherence of any sort. Each individual is independent and does not relate rhythmically to the others. Also, a solo singer.

3. Rhythmic unison. All voices move together with little or no rhythmic independence. A group may sing in parts and still be in rhythmic unison. All parts follow basically the same rhythm, so that they move together note for note.

5. Rhythmic heterophony. The singers tend to follow the same rhythmic pattern but one or more singers consistently deviates from the others in some way. Some may be out of phase with and trail the others; some may embellish the melody in an individual manner, or use more or less rubato than the others. They may follow the rhythm in a general way, trailing and catching up between the notes.

- If some parts are rhythmically distinct from others, code **7(RA)**, **9(Rp)**, **11(Rpm)**, or **13(Rc)**.

7. Accompanying rhythm. The singing group is divided into two or more parts, one of which accompanies the other. The accompanying part has independent rhythmic patterns but these are subordinate to the main part. They may be **(1)** less active rhythmically, **(2)** less active melodically, **(3)** softer, or **(4)** they may occur intermittently.

- If the accompanying part is equal in importance and rhythmic activity to the main part, so that the accompaniment becomes, in effect, another melody, consider coding **13(Rc)**.

9. Simple polyrhythm. All of the parts basically conform to a single pulse. However, there are moments when one of the parts will *temporarily* deviate from the basic pulse to create a new pulse in *conflict* with it. The conflict may last a moment or it may resolve itself after several “measures,” as in much classical Indian music. This rhythmic conflict may be only temporary.

11. Complex polyrhythm. Two or more conflicting pulses are heard simultaneously and

more or less continuously throughout the song. (For a fuller explanation of **9** and **11**, see explanatory note below.)

13. Rhythmic counterpoint. Two or more rhythmic patterns, equal to and distinct from one another, occur simultaneously within the same rhythmic framework, but without conflict of pulse. A fugue is an example of this trait; it can also be found in indigenous music. The principal trait to watch for is the presence of two or more independent and active parts throughout the piece.

About Polyrhythm (9 and 11).

On the whole, Western European art music is more developed harmonically than rhythmically. Much of its drama, motion, and subtlety depend upon the effect of harmonics and harmonic progressions. Though it exhibits considerable variety and invention, the rhythmic dimension is rather less developed in the music of the West than in certain other cultures. Even in so complex a work as a Bach fugue, where the composer has striven for the maximum amount of independence for each part, all of the voices usually conform to the same pulse and the same meter. Thus, when a work is said to be in 4/4-time and performed at the speed of 95 beats per minute, this refers to not to just one part, but to all the parts. With only a few brief exceptions, all the parts are in 4/4-time and all move at the speed of 95 beats per minute.

Modern composers have been working with more complex rhythmic relationships. This trend has its precedents in the polyphonic art music of medieval and Renaissance Europe, where one can find compositions with quite intricate rhythmic relationships. In other parts of the world, however, complex rhythmic organization of multi-part music is commonplace. Several different types of complexity exist, but because of the breadth of the musical sample and the vagueness of current concepts about this rhythmic situation, the following approach was chosen.

- Where there is a feeling of simultaneous rhythmic conflict in multi-part music, at least two of the parts will seem to be organized around different tempi. Moreover, the difference must be of such a nature that their juxtaposition creates a feeling of **conflict**. Such conflict-generating independence is often called polyrhythm, or cross-rhythm. We have been able to distinguish two varieties of polyrhythm, **simple** and **complex**, the first mainly characteristic of India and also found in the Near East and Andalucía; the second of Africa—although both are found elsewhere.

Line 13. OVERALL RHYTHM: ORCHESTRA

In most musical styles, the performer or performers employ a single, overall rhythmic plan that serves as a point of reference for the great variety of rhythmic detail possible within the scheme. Although a large number of such overall schemes are possible, here they are divided them into six general categories. The categories for this measure apply to the overall rhythm of the instrumental part.

Coding Instructions

1. Non-occurrence. No instruments.

3. One-beat rhythm. A series of equally accented single notes of about the same length.

6. Simple meter. One simple meter (duple, triple, simple, or compound) runs through the whole piece.

- If the entire piece is in 4/4, 3/4, 6/8, 9/8, 12/8, or any other similar meter, code **6**.
- **6** is *not* to be coded if the accents within the measure are unevenly distributed in a consistent manner throughout the piece (for example, 9/8 divided into 2/8, 2/8, 2/8, 3/8).

9. Complex meter. Here, as with **6**, one meter prevails throughout the piece, however the measure cannot be evenly divided by two or three to form subunits of two or three beats each. Thus, **9** includes such meters as 5/4, 7/8, 11/16, etc.

- Also, meters such as 9/8 and 12/8, although divisible by two or three, are coded **9** when the accent pattern within the measure is distributed unevenly but consistently throughout the piece.
- A subdivision of 12/8, into 3/8, 2/8, 3/8, 2/8, 2/8, for example, is coded **9**.
- However, a subdivision of the same 12/8 into the more usual 3/8, 3/8, 3/8, 3/8 is coded **6**.

11. Irregular meter. No one meter prevails throughout. A piece that is basically in 3/4, but has one or more measures in 2/4, is coded **11**, as well as a piece in which the meter shifts continually from measure to measure—for example, 3/4, 2/4, 3/4, 3/4, 5/4, 3/2, etc.

13. Parlando rubato. Free rhythm in which no regularly recurring beat can be distinguished.

Line 14. RHYTHMIC RELATIONSHIP WITHIN THE ORCHESTRA

The various types of relationships between the instruments are rated here.

Coding Instructions

1. No orchestra or non-patterned.

3. Rhythmic unison. All instruments move together with little or no rhythmic independence. A group may play in parts and still be in rhythmic unison.

5. Rhythmic heterophony. The instruments tend to follow the same rhythmic pattern, but one or more instruments consistently deviates from the others in some way. Some may be out of phase with and trail the others. Some may embellish the melody in an individual manner, or use more or less **rubato** (divergence from the strict beat) than others.

7. Accompanying rhythm. The instrumental group is divided into two or more parts, one of which accompanies the other. The accompanying part has independent rhythmic patterns, but these are subordinate to the main part. They may be (1) less active rhythmically, (2) less active melodically, (3) softer, or (4) they may occur intermittently. If the accompanying part is *equal* in importance and rhythmic activity to the main part, so that the accompaniment becomes, in effect, another melody, consider coding **13 (Rc)**.

9. Simple polyrhythm. All of the parts basically conform to a single pulse. However, there are moments when one of the parts will temporarily deviate from the basic pulse to create a new pulse in *conflict* with it. The conflict may last a moment or it may resolve itself only after several “measures,” as in much classical Indian music. In any case, this rhythmic conflict must be only temporary.

11. Complex polyrhythm. Two or more conflicting pulses are heard simultaneously and more or less continually throughout the song.

13. Rhythmic counterpoint. Two or more rhythmic patterns, equal to and distinct from one another, occur simultaneously within the same rhythmic framework but without conflict of pulse. A fugue is an example of this quality, which is also vigorous in folk and indigenous music. The principal feature to watch for is the presence of two or more independent parts active *throughout* the piece.

Line 15: MELODIC SHAPE

The characteristic contours of the vocal line are described in very general terms. While most of the other lines are scalar to some degree, this line did not lend itself to such treatment. Hence, the sequence of the four categories of melodic shape is arbitrary.

Coding Instructions

For categories **1**, **9**, and **13**, the shape of the most typical or characteristic phrases determines the rating, whereas **5** depends on observing the shape of the entire melody of the song, from beginning to end. If all phrases conform to the same shape, there will be no dilemma. Since most strophic and through-composed songs contain more than one type of phrase, choose what is *most characteristic* of the song as a whole. Usually this is simply a matter of observing which shape occurs most frequently or is associated with the longest and most important phrases.

If it is unclear which of these forms is most appropriate, **double code** the song accordingly. However, if any song is double coded as **undulating** but has some other shape as well, it is classified as belonging to this other category only.

1. Arched. An arched phrase begins at a certain point, rises in pitch, and then descends. Code at this point only if arched *phrases* occur prominently, *not* if the melody as a whole is arched.

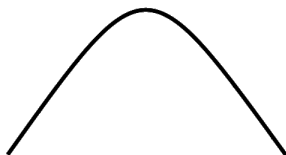


Figure 6. Arched melody.

5. Terraced. The *entire melody* is characterized by a long descent in pitch, interrupted by periods of leveling off and, in some cases, by incidental rises. The melody begins at a relatively high pitch, moves downward through a phrase or two, and then levels off. The next portion begins at the same pitch level or slightly above it, descending to an even lower point, where it once again levels off. This cascading descent proceeds throughout the song, so that the melody ends on or near its lowest point. A sketch of this kind of melody would resemble a terraced field or a tiled roof.

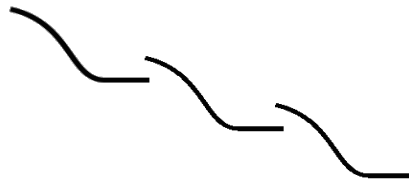


Figure 7. Terraced melody.

9. Undulating. Most phrases have a wave-like shape. They move up and down through a number of peaks and valleys of varying heights. Also coded here are those rare cases in which the shape of the phrase is predominantly ascending.

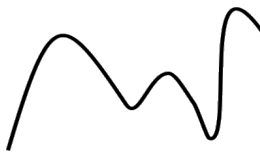


Figure 8. Undulating melody.

13. Descending. Most phrases descend gradually or abruptly.

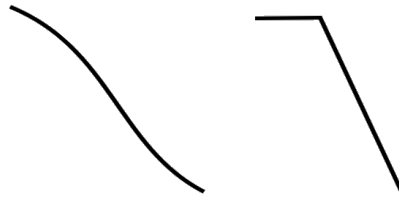


Figure 9. Descending melodies.

Line 16: MELODIC FORM

Line 16 is an attempt to deal succinctly with the full range of melodic forms. At one end of the scale is **simple litany**, defined here as a short tune composed of one or two phrases repeated over and over again; in the middle there are **strophic** forms; and at the other end is the most complex type, **through-composed**, in which many varied phrases are strung together in a fashion that to some listeners may seem to be almost formless. Degrees of melodic variation within these forms are dealt with here as well.

Three basic melodic forms—**litany**, **strophe**, and **through-composed**—are subdivided according to complexity and degrees of **melodic variation**. We focus our attention on the simplest and most obvious formal distinctions. Thirteen general types, scaled generally from simple to complex, have been chosen to describe the range of formal possibilities.

- Most **litany singing** involves many repetitions of these brief sections. If a litany tune is sung once, it leaves the listener suspended, with a feeling of incompleteness. This may be a culture-bound response to the form, but the fact is that litany tunes are seldom, if ever, sung only one time through. Normally a litany is repeated a number of times. This “ongoing” quality is the essence of litany, and indicates one essential difference between litany and other forms.

Table 2. Simple Litany

| | | | | | | | |
|-----|---|--|-----|---|--|-----|---|
| A | | | A | | | A | |
| ldr | | | ldr | | | ldr | |
| a | b | | a | b | | a | b |

- Distinguishing between litany and strophe.** In a leader-chorus pattern common, for example, in West Indian sea chanties, a single phrase may be divided between the leader’s and the chorus’s parts as follows:

Table 3. Leader-Chorus Pattern

| | | | | | | | | |
|-----|-----|-----|-----|--|-----|-----|-----|-----|
| A | | | | | A | | | |
| ldr | grp | ldr | grp | | ldr | grp | ldr | grp |
| a | | b | | | a | | b | |

- It is important to distinguish such cases from types in which the leader sings a complete phrase before the chorus comes in. *The decision to code strophe or litany depends on this distinction.* As a test, imagine the two parts sung by a single voice. You can then perceive whether the chorus part sounds like a continuation

of the leader's phrase or not. The pattern shown above would be coded as litany, since there are only two phrases (A and B). A tune with more than two phrases would not be considered a litany.

- A **strophe**, on the other hand, normally completes itself and *can* be sung once without leaving the impression that something else needs to be added or repeated. Another important characteristic of the strophic form is its sectional nature. The phrases are related in patterns of contrast and congruence that group themselves into larger units or sections. In our definition of **simple strophes**, these large units do not exceed eight phrases. There is usually only one unit, which is then repeated, perhaps with slight variation, as in the diagram below.

Table 4. Simple Strophe

| | | | | | | | | |
|-----|---|-----|---|--|-----|---|-----|---|
| A | | | | | A' | | | |
| A | | B | | | A' | | B' | |
| ldr | | grp | | | ldr | | grp | |
| a | b | c | d | | a' | b | c | d |

- In **complex strophes**, the larger sections may be quite long and there may be several of them. Repetition takes place, but not always in the same sequence—sections may be shifted and internally altered to form an intricate pattern.
- **Through-composed** songs are rarely divided into sections. Each phrase is succeeded by another to form a continuous chain. When larger sections are created they are almost never repeated. Completely new phrases appear at various points in the middle and even near the end. The total effect is usually that of a gradually evolving form, rather than an interrelationship of clearly established sections.

A Note on Variation

In many songs involving alternation between a leader and a chorus, the chorus sings the same phrase over and over with little **melodic variation**, while the leader varies his or her part continually. If the leader's part is predominant, the song can be coded for a high degree of variation; if the leader has only a few notes to sing, the degree of variation is considered moderate.

Coding Instructions

The **melodic form** series begins from the right of the coding line, at Point 13, with the forms of litany.

13. Canon or round form. Found only in certain types of polyphonic singing. The music is divided into two or more parts, each of which is rhythmically distinct. Each part is limited to one or two phrases repeated over and over. Simple rounds or canons are included here, and also the **hocketing** “bell chime” singing common among African Khoisan-speaking Bushmen and hunter-gatherers of Central and Eastern Africa.

12. Simple litany. One or two phrases repeated over and over again in the same order with **little or no variation**: A A A A or AB AB AB AB. Code here even when such a form is preceded by one or two phrases of introduction.

11. Simple litany with a moderate amount of variation in each repeat.

10. Simple litany with a high degree of variation in each repeat.

9. Complex litany is similar to **12** (simple litany), but involves certain complications, as in the following cases:

- One or two new phrases inserted in the midst of an otherwise similar phrase pattern: ABABABACCAB....
- More than one litany pattern occurring in the same song—that is, another new phrase may appear after the preceding one has been repeated several times. Such a pattern might be: AAAAAA...BBBBBB...CCCCCC....
- In much African singing, a clear-cut litany is established and then a refrain, sometimes of one phrase, sometimes more, may occur (see Line l8). If the refrain seems to occur irregularly, as in AAARAARAAAAAR, then code as complex litany. If it recurs regularly, as in AAAARAAAAARAAAAAR, code as a **simple strophe** (**6**, below). If there are five or more consecutive repetitions of the same phrase, code both **9** and **6**: AAAARAAAAAR.
- Litany pattern preceded by a short **through-composed** passage (**1**, below).
- Any litany involving more complexity than the simple repetition of one or two phrases can be coded complex litany.

8. Complex litany with a moderate degree of variation in each section.

7. Complex litany with a high degree of variation in each section.

6. Simple strophe with little or no variation. A series of three to eight (but not more than eight) phrases which are repeated, phrase by phrase, over and over, with no insertions of new material and no omissions or changes of order.

- A complete section must be performed *at least twice* to be coded as a simple strophe. Thus, a song with the repeated pattern ABACD ABACD is coded as a

simple strophe, but if the whole consists of two sections such as ABACD ABAC with only a partial repetition, it is coded as **complex strophe** (3, see below).

- A short pattern that is heard only once cannot be coded as a strophe, since there is no repetition of the whole pattern. Thus, a short song made up of only ABACD would be coded as **through-composed** (1, see below), even though it may seem “strophic.” However, if the recording is an excerpt from a performance in which complete repetitions did take place, code 6.
- Some simple strophes may appear to be more complex than they really are. Thus, in certain N. Amerindian songs there is the phenomenon of *incomplete repetition*: ABCC ABC ABCC ABC. As one listens for the first time for the repetition of a four-phrase strophe, it is easy to infer that since the last phrase does not recur as before the pattern is complex, not simple. The entire seven-phrase pattern repeated without omissions is revealed. Thus, the pattern does form a simple strophe: ABCCABC ABCCABC.

5. Simple strophe with a moderate amount of variation.

4. Simple strophe with much variation.

3. Complex strophe with little or no variation. 3 is similar to, but more complex than, 6. More is contained within the form than the regular repetition of three to eight phrases. Here are several basic types of complex strophes that have turned up in our study:

- There are more than eight phrases before a full repeat.
- There is more than one refrain: ABA CD ABA EF.
- The refrain is not sung until the strophe has been repeated one or more times: ABA ABA CDE....
- The order of the phrases varies from strophe to strophe: ABAC AABC ABAB....
- Some of the phrases are more often repeated in one strophe than another: ABC AABC ABC ABC ABBC.
- A series of simple strophes followed during the course of the same song by a different series of simple strophes: AABC AABC AABC DEFE DEFE....

2. Complex strophe with moderate to great variation.

1. Through-composed. A song that has no recognizable litany or strophic pattern, but instead is made up of a series of phrase groups in which consistently repeated sections seldom if ever occur. Not every section of the piece need consist of completely new material; certain melodic motifs may recur throughout, but not in a regularly occurring order. 1 is common in much Asian music as well as in Western art music.

Double coding may be resorted to in ambiguous cases such as these:

- A piece that has a definite strophic pattern, but in which all of the phrases end on the same note, strophe and litany are both coded.
- Some litanies have so much variation that they give the impression of being through-composed. If the proper choice is unclear, code both **1** and **10 (litany with much variation)**.
- Sometimes two forms may follow one another in the same piece. For instance, a litany may be preceded by a through-composed introduction. In such a case, double code—unless the introduction is relatively short (see definition of **9 (Complex lit)**).

Line 17: PHRASE LENGTH

A simple five-point scale is used to describe phrase length. Coding was done without a stopwatch for half the song sample, and then a test with a stopwatch was made. It was found that the length of phrase rated by ear closely approximated the stopwatch measurements.

Coding Instructions

If all phrases in the song are about the same length, coding should present no problem. If *most* of the phrases are of the same length, or if one phrase length seems typical of the entire song, code for the typical or most frequent phrase length and disregard the atypical phrases. If it is unclear which of two different lengths is most typical or frequent, code *both*. Use a stopwatch if desired.

1. Very long phrases. Phrases that seem to run to the limit or beyond the limit of a singer's breath capacity (16+ seconds).

4. Long phrases. An intermediate point between medium phrase lengths and very long phrases (10-15 seconds).

7. Medium phrases. Normal for the familiar English ballad type (5-9 seconds).

10. Short phrases. (3-4 seconds).

13. Very short phrases. (1-2 seconds).

Line 18: NUMBER OF PHRASES

Determine the number of melodic phrases that occur in a song before a full repeat of the entire phrase sequence, as well as the presence or absence of phrase symmetry.

Coding Instructions

Counting Phrases. Since phrase counting can be confusing, especially if there are many phrases in a song, adopt a straightforward method of keeping count. Raising a finger at the beginning or end of each phrase is one way to do this. A pause, inhalation, or the end of a word may mark the end of a phrase, although this is not always the case. Since the phrase is essentially the smallest possible “complete” musical idea, listen for when one musical idea ends and a new one starts.

- Count the number of phrases that occur in a song before there is a full repeat. A song such as ABC ABC ABC would be considered to have three phrases. ABC ABC DE, ABC ABC DE, ABC ABC DE has a full repeat only after eight phrases, despite the partial repeat of the ABC section.
- Some songs having in their entirety such a pattern as ABC AB BC ABC BC, or ABC AABC, contain no full repeat. Here the number of phrases counted should be the total of *all* the phrases—in the first case, 12, and the second, 7.
- The exception to this rule occurs in **complex litanies**, in which the initial pattern of a frequently repeated phrase governs the coding decision. Thus, a complex litany organized as A A A A A B C A A A A A B C would be considered to have one phrase, since the initial pattern is a repeat of the single phrase “A.”

Symmetry/Asymmetry. Also code the presence or absence of **phrase symmetry**. If all phrases of a melody are approximately the same length, code for symmetry. If even one deviates from the standard pattern, code for asymmetry. There are eight points on this scale:

1. There are more than eight phrases before a full repeat.
3. There are five or seven phrases before a full repeat.
5. There are four or eight phrases, asymmetrically arranged.
6. Four or eight phrases symmetrically arranged. All phrases are approximately the same length.
8. Three or six phrases, asymmetrically arranged.
9. Three or six phrases, symmetrically arranged.

11. Two phrases asymmetrically arranged.

13. One or two phrases, symmetrically arranged.

- Double code if a song is divided into two parts, one of which has a different number of phrases from the other.
- You may also need to double code if a song is coded for **Melodic Form** (Line 16), which would indicate that the form could be looked at in *two different ways*. For example, a song coded for both **1 (Through comp)** and **10 (Lit w/hi var)** on Line 16 might be double coded as **1** and **13** here.

For Lines 19 through 21 it will be helpful to read through “On Coding Melodic Features” (Appendix I).

Line 19: POSITION OF FINAL TONE

The relation of the final note to the total range of the song. The ear training one develops through listening to the musical examples facilitates a simple, non-technical approach to the concepts outlined here. The rating scale used is a relatively simple one.

Coding Instructions

- In simple **strophic** or **litany** songs, one need only listen for the last note of a *repeated section*.
- In **through-composed** and certain **complex strophic** and **litany** songs, listen for the last note of the *entire song*.
- In **polyphonic music** there may be more than one final note. In such cases the extreme notes of the last chord are *both* coded.

1. The final tone is the **lowest note** of the song.
4. The final tone falls within the **lower half** of the total range.
9. The final tone is located at or near the **midpoint** of the total range.
11. The final tone falls within the **upper half** of the total range.
13. The final tone is the **highest note** of the song.

Line 20: MELODIC RANGE

This is a method of judging the total melodic range of a song, which is the distance between its highest and lowest notes. Careful listening makes it possible to take a non-technical approach to this measure.

Coding Instructions

Here, every note that is heard in a song must be taken into consideration, even if it occurs only once. Treat the entire song as a single unit and code for the full range of pitches heard. If there are two parts with very different ranges, the parameter can be double coded, with one coding for each. Do not average the number of pitches.

When both men and women participate, the following procedure is used:

- If women are singing an octave higher than men, their part would be considered as though it were actually in unison with the men.
- If there is alternation between a male soloist (or group) and a female soloist (or group) the female part is considered to be an octave lower than it actually is.
- If, however, the song is polyphonic, the women's part is considered at its actual pitch, provided the part is unique and not merely doubling the men an octave higher.
- If the song is divided into **two sections that are highly contrastive** in range (e.g., the first section is a major second in range, the second, a major tenth), it can be double coded for both traits.
- Similarly, in those rare cases where two songs are being sung simultaneously and their respective ranges are highly contrastive, the total range of each would be coded. If the differences in range are not highly contrastive in the above cases (e.g., one is a fifth, the other an octave or a tenth), the range of both is coded.

1. A monotone to a major second.

4. A minor third to a perfect fifth.

7. A minor sixth to an octave.

10. A minor ninth to a major fourteenth.

13. Two octaves or more.

Line 21: INTERVAL SIZE

An interval is the distance in pitch between two notes. Here interval size is estimated by using a subjective five-point scale, in order to determine the relative frequency of one or more size-categories of interval in a performance.

Coding Instructions

Ideally, the best way to determine the prominence of any one kind of interval is to count the number of times it occurs. Since this procedure is time-consuming and in fast music almost impossible, make a **subjective estimate** instead. Actual counting may be resorted to if no subjective decision seems reliable.

Listen for the kinds of intervals that occur in the melody of the song, noting that

- Intervals sounded in chords are not considered.
- Intervals that occur between the end of one phrase and the beginning of the next are not considered.

1. Monotone. No intervals occur. The song remains on approximately one pitch. A polyphonic song would be coded “monotone” if each part stays at the same pitch level.

4. Narrow intervals. Intervals of a half step or less are prominent (though not necessarily predominant) in the song.

- Intervals found in embellishments are to be considered as well as intervals between main notes of the melody.
- Even when whole steps predominate in the song, code **4** if smaller intervals are also outstandingly important.
- When small intervals are prominent but thirds or larger intervals actually predominate, double code for **4** and either **10 (large)** or **13 (V. large)**.

7. Diatonic intervals. Diatonic melodies where whole step predominates.

- Half steps may occur, but not prominently.
- Thirds, fourths, or fifths may occur prominently, but not so often as whole steps and half steps.

10. Large intervals. Intervals of a third occur more frequently than other intervals.

13. Very large intervals. Intervals of a fourth and a fifth or larger predominate.

Line 22: POLYPHONIC TYPE

This measure considers the use of simultaneously produced intervals other than unison or the octave. Two-part intervals of this kind are considered polyphony, as well as harmonies of greater complexity. Simultaneously produced intervals may also occur in heterophony. (See also Line 4.)

Coding Instructions

Polyphony is coded only if one of the following situations is perceived:

- Simultaneously produced intervals other than unison or the octave are heard often enough so that it is obvious that part-singing is taking place.
- When simultaneously produced intervals other than unison or the octave are infrequent, polyphony is coded only if they recur in some consistent way, perhaps once every few phrases or at a certain part of each repeated phrase.
- In intermediate cases, the length of the sounded intervals is relevant. If they tend to last about as long as the important melody notes, it is likely that true polyphony exists. If chords are ephemeral, the case is probably **heterophonic**.

The coding line is arranged so that the degree of harmonic complexity and integration increases generally from left to right.

1. No polyphony.

3. Drone polyphony. One or more tones are held or repeated while the melody follows its own course. The drone part or parts need not necessarily remain on the same level throughout the song. The pitch of the drone can be shifted, while another part moves freely around it. Do *not* code drone polyphony when the drone effect is only a transitory one.

6. Isolated chords. Chords occurring in a texture that is basically unison—chords that appear in a song otherwise sung in unison. Two different chords rarely succeed one another. In some cases, there may be only one chord in each section. If this chord tends to recur at the same point in each repetition, the song is coded **6**. If not, the song is *not* considered polyphonic.

8. Parallel chords. Two or more parts moving parallel to one another at pitch intervals other than the octave or unison. Parallel means that the parts move in the same direction. The distance between the parts does not have to be maintained at *exactly* the same interval throughout, as long as the general movement is parallel.

10. Harmony. Contrary motion occurs. Some parts move downward while others move upward. This may also happen within the general context of parallel movement. As long as there is some significant amount of contrary motion, **10** can be coded.

13. Counterpoint. Two or more parts that are rhythmically and melodically independent. In all other cases except drone polyphony, the parts move together rhythmically. In **counterpoint**, as distinct from the drone, the parts are active melodically. **13** is coded when at least two parts are rhythmically active and contrastive.

Two kinds of polyphony may occur at the same time. In these instances, code both types.

- Isolated chords or parallel chords may occur with drone polyphony.
- A chorus singing parallel chords may be in counterpoint with a leader singing a free melody.

Line 23: EMBELLISHMENT

Embellishment is one of several devices used by the singer as a kind of qualification, or ornament, of the “basic” melodic line. An embellished melodic line contains two entirely distinct kinds of note value, the embellished part being much more rapid and ephemeral than the melodic part.

Other kinds of ornaments considered in Cantometrics are **Melisma (Line 29)**, **Glissando (Line 28)**, **Tremolo (Line 30)**, and **Glottal shake (Line 31)**. Of these five, embellishment is closest to the melodic dimension, tremolo and glottal shake being more closely related to vocal qualifiers.

Coding Instructions

In Western music notation, embellishments are generally written as grace notes—notes smaller in size than the notes of the basic melody line—and are given no definite time value. Whether or not one is familiar with musical notation, one can simply identify the notes that seem the most essential to the melody. Bear in mind the criterion that if one of them were omitted, the shape of the melody would be noticeably altered.

Then listen for any very rapid, relatively weightless notes inserted *between* the basic notes. These are the embellishments. Their effect is to color the song in a special way. If they were omitted, the melody would lose much of its atmosphere and feeling, but the overall melodic shape would not change.

Embellishment is often found in close association with **Glissando (Line 28)**, **Rubato (Line 26)**, and **Melisma (Line 29)**, but it can be coded without reference to them.

In some styles **embellishment** and **glottal activity** are combined. In such cases, record your judgment about the relative strength of each on the two coding lines.

In choral singing, all singers may not use the same degree of embellishment. The leader, for example, may sing with much embellishment, while the chorus uses none. In such cases, note both degrees on the coding line for embellishment.

1. Extreme embellishment.

4. Much embellishment.

7. Medium or considerable embellishment.

10. Slight embellishment.

13. Little or no embellishment.

Line 24: TEMPO

As employed in Cantometrics, tempo is based on a relative and approximate determination of the speed or speeds of a performance.

Coding Instructions

Determining the absolute tempo of a song is a complex matter. Before metronome marking can be assigned, a song must be transcribed, and a specific note value chosen as the unit of beat. In many cases, however, the beat is ambiguous. With a song in 4/4 time, for example, whether the quarter note or half note is the unit of beat may be unclear. If the quarter-note value equals 120 beats per minute, the half note equals 60. Thus, using the quarter rather than the half note as the unit of beat would double the speed as it is read from the metronome mark. Such a margin of error is too great.

Here the approach is to use a subjective scale from “very fast” to “very slow,” with gradations between. The surest way to get the feel of the tempo may be to sing along with the recording and make this experience the basis of judgment. Despite the seeming simplicity of this approach, it works quite well in practice, producing few difficulties for the coder and generally resulting in no more than one-point differences of judgment among different coders.

- In some styles of singing, tempo changes occur within a performance. In such cases **double coding** is called for. If an item ranges through several tempi, only the extremes are coded.

1. Very slow.

3. Quite slow.

5. Slow.

9. Moderate tempo. The music moves at a neutral pace which sounds neither fast nor slow.

11. Fast.

13. Very fast.

Line 25: VOLUME

Volume measures the relative degree of loudness in a performance. As with tempo, a subjective scale cued by the human ear proved most useful for determining volume. A decibel count of volume in any given recording is affected by so many factors that it would be meaningless unless every stage of both the recording and playback were subject to the most rigorous control.

On the other hand, the human ear-plus-mind can distinguish loudness or softness as psychological effects, with little reference to their measurable volume. By simply adjusting the volume control of any device, the ear can determine the level of volume appropriate to a given sound-signal. It is this level of auditory awareness that is required here.

Coding Instructions

Select the level of loudness that seems most appropriate to attribute to any given performance. Loudness may vary, but not to any great degree, or it may occur as the result of the natural differences between attack and production of a stable tone, or as the result of shortness of breath at the ends of phrases, etc. Determine which level of volume seems most characteristic of the song *as a whole* and code for that volume only. If the degree of loudness varies sharply within a song, then two degrees of volume—the extremes—are both coded.

1. Very soft.

4. Soft.

7. Mid-volume.

10. Loud.

13. Very loud.

Line 26: RUBATO: VOCAL

A judgment about how strictly tempo is maintained during a vocal performance.

Coding Instructions

First find an underlying, steady beat, and then determine the degree to which the performance strictly adheres to or deviates from it.

- **Double code** if the song is in two parts that are contrastive in this respect, or if some of the singers use substantially more rubato than others.
- A four-point scale ranges from a rhythmic situation that is handled very freely (**extreme rubato**) to **strict tempo** (or **no rubato**):

1. Extreme rubato. If there is no beat, and the piece has already been coded **13 (Free rhythm)** on Line 11 (**Overall vocal rhythm**), **1** is automatically coded.

5. Much rubato.

9. Some rubato. A small amount of freedom—for example, if pauses of irregular length occur between sections or stanzas of the melody.

13. No rubato. Strict conformity to the beat.

Line 27: RUBATO: ORCHESTRA

A judgment about how strictly tempo is maintained during a performance, applied to the orchestra or accompanying instruments.

Coding Instructions

First find an underlying, steady beat, and then determine the degree to which the performance strictly adheres to or deviates from it.

- If there is strict conformity to the beat, code **13 (No rubato)**.
- If there is a small amount of freedom—for example, if pauses of irregular length occur between sections or stanzas of the melody—code **9 (Some rubato)**.
- If there is even more rhythmic freedom, code **5 (Much rubato)**.
- If there is no beat at all, and the piece has already been coded **13** on **Line 13 (Overall rhythm: orchestra)**, **1 (Extreme rubato)** is automatically coded.
- **Double code** if the piece is in two parts that are contrastive in this respect, or if some musicians use substantially more rubato than others.

A four-point scale ranges from a rhythmic situation that is handled very freely (**extreme rubato**) to **strict tempo** (or **no rubato**):

1. Extreme rubato.

5. Much rubato.

9. Some rubato.

13. No rubato. Strict tempo.

Ornamentation (Lines 28 through 31).

Line 28: GLISSANDO

Glissando is the effect created when the voice slides smoothly from one tone to another, passing through all the intermediate pitch levels.

Coding Instructions

Listen for the number of tone changes accompanied by glissando, and also for the degree of prominence of this effect in the whole performance.

1. Maximal glissando. Glissando is extremely prominent.

5. Prominent glissando.

9. Some glissando.

13. Little or no glissando.

Line 29: MELISMA

The same syllable of text sung to two or more notes of melody—or, conversely, the passage of several notes over one syllable.

Coding Instructions

A song is **melismatic** when a single syllable is extended over several different pitches, as in the coloratura sections of operatic arias or in elaborate forms of Gregorian chant. A song is **syllabic** if it is sung with one note per syllable.

- The frequency of unarticulated pitch changes is an approximate measure of the degree of melisma. Take care to distinguish between embellishment and melisma. Glottal shakes, tremolos, and embellishments are *not* considered articulated pitch changes.

1. Much melisma. Most of the pitch changes are unarticulated.

7. Some melisma. Some of the pitch changes are unarticulated.

13. Little or no melisma. Syllabic: All of the pitch changes are articulated in separate syllables.

Line 30: TREMOLO

Tremolo is a quavering or shaking in the voice, heard as an undulation between two closely adjacent pitches or tone colors. It is usually discernible only on notes held for an appreciable length of time.

Coding Instructions

Listen for held notes and observe the degree to which undulations, if any, are used by the singer. It is difficult to draw the line between vibrato and tremolo. For our purposes, any quaver of the voice that is audible is considered tremolo. If the undulation is so finely controlled and so narrow in pitch (as in normal vibrato) that it is heard as a constant aspect of the singer's voice quality, it is *not* considered tremolo.

1. Much tremolo. Tremolo is heavy throughout the song.

7. Some tremolo. Tremolo is present and noticeable, but relatively slight.

13. Little or no tremolo.

Line 31: GLOTTAL

Glottal articulation is the product of noticeably forceful activity in the pharyngeal, or glottal, area in the back of the throat. Some singers actually manipulate their laryngeal prominence (Adam's apple) with their fingers to produce this effect.

Coding Instructions

Code here for glottal stops, glottal trills, glottal stroke, and considerable amounts of glottal articulation, as well as strongly emphasized, wide **vibrato** from deep in the throat.

Glottal activity might be mistaken for **tremolo**, but while tremolo is a wavering sustained tone akin to the vibrato that accompanies much singing as an acoustic feature, glottalized sound is produced in the pharyngeal or glottal area of the throat. If in doubt, try to reproduce the sound. This will help you to distinguish between the intermittent, highly emphasized, forceful phonations produced by the glottis, and tremolo, embellishment, or normal vibrato.

1. Much glottal. Strongly characterized by glottal activity.

7. Some glottal. Glottal activity present and noticeable.

13. Little or no glottal. Little or no glottal activity.

See “On Coding the Human Voice” (Appendix I) for further explanation of Vocal Qualities (Lines 32 through 37).

Line 32. VOCAL PITCH (REGISTER)

Vocal pitch refers to the tonal height, or frequency, of the voice. It is commonly used to describe the key most natural for the voice of the singer.

Coding Instructions

Make a judgment about the “natural” placement of the voice of the singer and then determine whether they are

- Staying at the middle of their range
- Singing at the upper or lower end of their range
- Pushing it to one or both extremes.

It is best to begin by using the rating scale in a fairly naive way, trusting one’s first reactions in coding, and improving one’s judgment by practice. **Double code** when more than one register is used by one singer, or when two singers are using different registers.

1. Very high. Usually falsetto in men.

4. High. Usually head register.

7. Mid-voice.

10. Low. Usually sung “in the chest.”

13. Very low. The singer is probably producing their lowest tone.

Line 33: VOCAL WIDTH

This measure concerns the contrast between voices that sound mellow, relaxed, and resonant (**wide**), and voices that are tense, pinched, and restricted in resonance (**narrow**).

Coding Instructions

At the extremes, vocal width ranges from a pinched, narrow, squeezed voice to a wide, open-throated singing tone—that of yodeling, for example. This is the product of a set of dimensions within the vocal apparatus that includes:

- The distance from the outside of the lips to the back of the oral cavity.
- The width of the opening of the throat.
- The opening of the glottis.
- The relative tension of the glottal region.

When these dimensions are at their largest and most relaxed, the individual is breathing deeply and naturally with a wide-open mouth. At the other extreme is maximum constriction of all vocal dimensions, as in ventriloquism. Between these two extremes five degrees of **vocal width** or **narrowness** are identified. The following definitions grew out of experiments in “creative listening” (see Appendix I, Note on Coding the Human Voice).

1. Very narrow. The narrowest, squeezed, thin, and tense voices. The vocal cavities are narrowed and constricted by raising the glottis, raising the tongue and pulling it back, and tensing the muscles in the throat.

3. Narrow. A markedly squeezed, narrow, and tense voice.

6. Speaking. Medium width, neither narrow and tense nor wide and relaxed, this voice often has a speech-like quality.

8. Wide. A relaxed, open-throated voice, usually evincing a considerable amount of resonance. This latter quality can be obscured by nasalization, which can be produced simultaneously.

10. Very wide. A wide-open, resonant, often ringing or liquid voice

13. Yodel. A distinctively liquid, wide-open, extremely relaxed way of singing. It is often, but not necessarily, characterized by quick, wide, and seemingly effortless leaps in pitch that pass from chesty tone to falsetto, or head tone, and back again.

Line 34: NASALITY

A nasalized tone is a strong marker of some singing styles even in the absence of nasal syllables, probably because singing is normally louder and more forceful than speaking. When a wide sample of recorded song is examined, the absence of nasalization in some styles is also striking. For this reason, nasalization is coded, in spite of the vagueness of the term.

- A nasal tone is produced when the soft palate drops and air is forced through the nose, producing a “twanging.” Certain kinds of intonation seem to activate the nasal passages in ways that are only perceptible to the ear.

Coding Instructions

Where great nasalization shows up both in speech and in song, code for great nasalization. As in the case of much of French vocalization, this is simply a steady vocal signal in this culture, and perhaps an index to a certain emotional set.

Although there has been some difference of opinion as to degree, there has been consensus among students of Cantometrics on the presence of great nasality or its relative absence. Since Cantometrics was first published, acoustic research has further explored various types and degrees of nasalization. Thus far, fairly reliable results have come from coding based on the human ear and upon “creative listening.”

Determine the degree of nasality by listening to **long vowels** such as ah, oh, uh, ee (/i:/, /u:/, /e:/, /o:/, /a:/) etc. that are *not* preceded or followed by a nasal consonant ([m], [ɱ], [n], [ɳ], [ɲ], [ɳ], and [ɳ]). If these seem to be nasalized, one can be sure that nasalization is present in some degree.

1. Extreme nasalization. Strongly nasalized throughout the performance.

4. Marked nasalization. Marked nasalization, with definite but not extreme nasality running throughout the performance.

7. Intermittent nasalization. Nasality that occurs irregularly but clearly in the voice, as is frequently the case with singers of sub-Saharan African origin. This is the midpoint in the line and may be coded for songs that seem to be neither marked nor slight in their degree of nasality.

10. Slight nasalization. Occasional touches of nasalization that do *not* occur in relationship to nasal consonants. This situation is encountered, for example, in the singing of many groups of Central Europe.

13. Little or no nasalization. Where nasalization occurs only in connection with nasal consonants, or where nasal consonants tend to be eliminated and little or no nasalization is heard.

Line 35: RASP

Rasp is frequently associated with very marked, forced vocalizing. It cuts through musical performances in which everyone is singing loudly with a loud accompaniment. In some parts of the world, performers sing in a grating tone, at the same time forcefully emphasizing consonants. The result is clear articulation, but with a noisier tonal image.

It is also possible to sing with enormous volume, as do Western opera singers, without introducing any degree of rasp. In a number of small-scale societies singers seem to use rasp in a relaxed way; their intention may be to produce growling or roaring sounds to identify with the animal world. Other singers use a deep, chesty vibrato, producing the effect of rasp.

Coding Instructions

When Cantometrics was being developed, there were no existing measures of the presence of hoarseness, stridence, grating, buzzing, etc. in singing and speaking. Lomax and Grauer gathered these throaty, asperous vocal qualities under Rasp. With analysis of vocal timbre aided by Music Information Retrieval Technology, it may soon be possible to make significant distinctions among several kinds of throaty noises. Code for the presence of these qualities:

- 1. Extreme rasp.** A markedly strident, hoarse, or grating singing voice.
- 4. Great rasp.** Pronounced rasp, but less strident than above.
- 7. Intermittent rasp.** Intermittent, or moderate and steady rasp.
- 10. Slight rasp.** Perceptible touches of rasp.
- 13. None.** Voices lack rasp.

Line 36: ACCENT

Accent is heard as the dynamic attack on sung tones. It describes the prominence given to a note or chord, usually by increasing the volume or lengthening the duration, or by a brief preceding silence.

Coding Instructions

Assess the relative strength of the dynamic attack on sung tones in a given recorded example. Certain singers stress the first note in every small phrase with great force—the case, for instance, with many N. Amerindian and Arctic singers. At the other extreme there are singers who use barely perceptible accents. When notated, a forceful accent produces a jagged profile of stresses with many peaks. A relaxed accent produces an even profile of stress with few peaks.

1. **Very forceful accent**, with powerful stresses falling on many notes.
4. **Forceful accent**, with strong accents falling on the main pulses of the meter.
7. **Moderate accent**, a moderate stress falling along the main beat pattern of the meter, clearly outlining but not exaggerating it.
10. **Relaxed accent**, a relaxed handling of the accent pattern.
13. **Very relaxed**, absence of clear stresses, such that a flowing, sometimes understated, melodic line is produced.

Line 37: ENUNCIATION

Employing a scale of five degrees, this measure evaluates how precisely **consonants** are articulated in sung texts. It must be borne in mind that, in general, enunciation in singing is bound to be less clear than in speaking.

Coding Instructions

Code the degree of precision with which consonants are enunciated, from very precise to the other extreme, an eliding of all the syllables. Consonants may be clearly articulated, moderately articulated, casually so, or softened or blurred. In order to establish a feeling for this measure, try singing or speaking with the most exaggerated articulation possible, and then gradually diminish the distinctness of your pronunciation until all the syllables run together with a minimum of clarity.

1. Very precise enunciation. Highly articulated consonants and syllables. This is generally typical of the storytelling singers of Eurasian polities.

4. Precise enunciation. Clearly articulated consonants in sung texts. Here one listens to the whole consonantal range and makes certain that all consonants are easily discernible.

7. Moderate enunciation. A moderate degree of enunciation.

10. Softened enunciation. Consonants are hard to distinguish and syllables are run together to some degree.

13. Very softened enunciation. Situations in which consonants are absent or nearly absent from the text, and/or in which syllables are run together.

In 2006, while adding nearly 1,000 new codings, mostly from sub-Saharan African cultures, Victor Grauer became convinced that the system called for analysis of the following characteristics. They are thus included, and should be coded, although illustrative lessons are not given in Songs of Earth: The Course (I-4).³

Line 38. HOCKET

Hocket can be defined as the tossing of a single melodic line back and forth between two or more performers. In some cases, as in a bell choir, or certain African wind ensembles, each performer plays only one or two notes. For our purposes in this context, however, hocket can be more broadly defined as a special type of interlock (see Line 1, Point 13) characterized by the use of relatively short and/or fragmented motifs interwoven with one another. If every individual part tends to be sung continuously, with little or no “space” between the notes, then code interlock on Line 1, but Code Line 38 as “None.” If at least one part contains “holes” that tend to be filled by at least one other part, then hocketing is present.

1. None, no hocket at all.

7. Some. A certain amount of hocketing can be detected but it is not pervasive.

13. Pervasive. Hocketing is pervasive, detectable throughout most of the performance.

Line 39. CANON

Each performer presents the same melodic line, but with staggered entries, echoing each other, so there is a time interval between the beginning of the second part and the first, and so on—similar to a *round*, such as “Row, Row, Row Your Boat.” Though each part may continue at the same time interval consistently throughout, for our purposes this is not necessary, nor do the parts have to be precisely synchronized, as in a typically Western performance. Canon is coded whenever two or more performers sing more or less the same line at different times, regardless of how loosely they may be coordinated. Canon is *not* coded, however, if one performer simply repeats what the other has sung, without any overlap between the two.

1. None. no canon at all.

7. Some. A certain amount of canon can be detected but it is not pervasive.

13. Pervasive. Canon is pervasive, detectable throughout most of the performance.

Line 40. BREATHING/PHRASING

In the traditional concert and popular music of the West, phrasing and breathing are coordinated, so a singer or chorus will almost always breathe only at the end of a phrase. In other traditions this is not necessarily the case. A solo singer may interrupt the phrase to take a breath, or there might not be any phrases at all, but just a stream of continuous singing, interrupted by breathing whenever necessary. Lack of coordination between phrasing and breathing may also be heard in group performances, where vocalizing is continuous and individual singers stagger their breathing so as not to interrupt the continuous flow of sound.

1. Uncoordinated. Breathing and phrasing are consistently uncoordinated.

7. Mixed. Breathing and phrasing are coordinated some or even most of the time, but there is at least one clear instance where they are not.

13. Coordinated. Breathing and phrasing are consistently coordinated. This does not mean that every phrase ends with a breath, but that all breaths come at phrase endings.

Line 41. CONTINUOUS FLOW

Code for continuous flow when, in a group performance, the singers stagger their breaths or interlock parts as a group so as not to interrupt the flow of sound. While continuous effects may be produced during leader-chorus response, continuous flow is coded only when the entire vocal group is involved in producing a continuous stream of sound in this manner, not when it is produced only by leader-chorus or chorus-chorus antiphony. But when only two singers interplay in this manner to produce a continuous stream of sound, continuous flow is also coded.

1. No. Continuous flow is *not* present.

13. Yes. Continuous flow *is* present.

Line 42. ITERATION

Iteration is the immediate repetition of the same pitch, usually articulated by consonants. The clearest example is what is often heard in N. Amerindian singing, where frequently one note is repeated, often at the end of a phrase— basically the repetition of a single pitch.

- 1. Continuous iteration**, with all or almost all notes on the same pitch.
- 4. Frequent iteration**, with most notes on the same pitch.
- 7. Noticeable iteration**, where repetition of the same pitch may not be the rule, but is nevertheless clearly evident.
- 10. Some iteration** is present, more than an insignificant or purely incidental part of the melodic content.
- 13. Insignificant to no iteration.**