On Interpreting Bach

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Purpose

• To develop a “formally precise model of the cognitive processes involved in the comprehension of classical melodies”
• To devise a set of rules for musical dictation using the 48 fugue subjects of the Well Tempered Clavier

Results

• 2 “parsing” programs were written:
  – 1 to determine metrical units
  – 1 to determine harmonic relationships between notes
• Both programs require rules to account for 2 fundamental problems in musical dictation:
  – Identification of the primary organizational strategy
    ▪ metrical units = time signature
    ▪ harmonic relationships = key signature
  – Criterion for a perceived change in the primary organizational

Assumptions

• Interpretation
• Enharmonic Spellings
• Rule of Congruence
Assumptions: Interpretation

• The performer’s interpretation is “an aesthetic question”
• The listener’s interpretation is at least “partly amendable to objective investigation”

Assumptions: Enharmonic Spellings

• Musical tones may be notated in multiple ways for either convenience, or modulation
• Music theory has no rules governing the “correct” score of a melody
• Measures can be divided, and subdivided based on the metrical units. Baroque music is always divided into multiples of 2 or 3; never 5 or 7

Assumptions: Enharmonic Spellings

Assumptions: Rule of Congruence

• Musical comprehension is “progressive” (i.e., ideas become more definite as events proceed)
• A limited number of possible events exist in an “acceptable” melody; this applies to both metrical and harmonic features
Baroque Counterpoint

• Fugue Structure

• Treatment of Dissonance

Baroque Counterpoint: Fugue

• Typical Fugue Structure
  – 3 or 4 “voices” (can be from 2 to 6)
    ▪ voice 1 = “subject”: begins alone
    ▪ voice 2 = “answer” (imitation of subject): begins on dominant; countersubject (free counterpoint) may begin
    ▪ voice 3 = subject is repeated

Baroque Counterpoint: Dissonance

• Treatment of Dissonance
  – Passing Tones: connects consonance
  – Neighboring Tones: step above or below
  – Suspension: held over dissonance
  – Appoggiatura: occurs on strong beat (often by leap) step to resolution
  – Anticipation: note that belongs to the next chord
  – Echappee: step to dissonance, leap to resolution
  – Cambiata: alternation between dissonance and consonance (usually 5 notes)
Baroque Counterpoint: Dissonance

- Passing [Ex. 2]
- Neighboring [Ex. 3-6]
- Suspension [Ex. 7]
- Appoggiatura [Ex. 8-9]
- Anticipation [Ex. 10]
- Echappee [Ex. 11]
- Cambiata [Ex. 12-13]

Method

- Application of the Rule of Congruence
- Metrical Algorithm
- Harmonic Algorithm

Method: Rule of Congruence

- Non-Congruence cannot occur until it can be recognized
  - All notes are considered congruent until key and meter have been established (unless it is non-congruent with all possibilities)
  - Once key and meter have been established, the notes that follow are labeled congruent or non-congruent

Method: Metrical Algorithm

- Regardless of its duration the first note of a Subject may always be taken to define a metrical unit on some level of the hierarchy
- Once a metrical unit has been adopted, it is never abandoned in favor of a shorter one
Method: Metrical Algorithm

- A higher level meter can be established if a succession of accented notes occurs where each is followed by unaccented notes.

- If a note at the beginning of a metrical unit last 2 or 3 times the established metrical unit, that unit can be doubled or tripled respectively.

- The concept of “accent” is extended to metrical units as well as to individual notes. A metrical Unit is “marked for accent” if a note begins at the beginning of a unit, and continues through it.

Method: Metrical Algorithm

- Dactyls (long-short-short-long rhythmic figure) may lead to a change in meter if they occupy a “reasonable” number of metrical units.

Metrical Algorithm: Limitations

- Avoids mistakes at the cost of incomplete analysis
  - Limited to dead-pan performances; cannot account for phrasing and dynamics
  - Cannot distinguish meter with Subjects where all notes are the same length.
Method: Harmonic Algorithm

- Harmonic relationships are represented in a 2-dimensional array by assigning each note within an octave a number from 0-11.

Method: Harmonic Algorithm

- Melodic Convention: the notes of melodic minor differ in ascending and descending motion
  - Ascending = M6, M7
  - Descending = m7, m6

Therefore, notes 8, 9, 10, and 11 must be considered in context of an increase or decrease in value (e.g.: 9, 11, 0; or 0, 10, 8)

Method: Harmonic Algorithm

- Tonic-Dominance Preference Rule: in the instance of multiple harmonic possibilities, the first note is assigned to tonic; and if this is incongruent, the first note is assigned to dominant.

Method: Harmonic Algorithm

- Semitone Rule: in a chromatic scale, the interval between the first 2 notes, and the interval between the last 2 notes, is always a semitone within the established key.

- City Block Rule: a single note outside the established key, which is not part of a chromatic scale, is placed in the closest possible relation to the established key.
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