Tone and Voice: A Derivation of the Rules of Voice-Leading from Perceptual Principles
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Some Abbreviations
- G - goal
- A – empirical axiom
- C - corollary
- D – traditional derived musical rule
- [D] – non-traditional derived musical rule

The Goal
- G1. The goal of voice-leading is to create two or more concurrent yet perceptually distinct "parts" or "voices." Good voice-leading optimizes the auditory streaming.
[D1.] **Toneness Rule.** Voice-leading should employ tones that evoke strong, unique pitch sensations. This is best achieved using harmonic complex tones.

[D2.] **Registral Compass Rule.** Voice-leading is best practiced in the region between F2 and G5, roughly centered near D4.

[D3.] **Sustained Tones Rule.** In general, effective voice-leading is best assured by employing sustained tones in close succession, with few silent gaps or interruptions.

[D4.] **Chord Spacing Rule.** In general, chordal tones should be spaced with wider intervals between the lower voices.

[D5.] **Tessitura-Sensitive Spacing Rule.** It is more important to have large intervals separating the lower voices in the case of sonorities that are lower in overall pitch.

[D6.] **Avoid Unisons Rule.** Avoid shared pitches between voices.

[D12.] **Leap-Lengthening Rule.** Where wide leaps are unavoidable, use long durations for either one or both of the tones forming the leap.

[D13.] **Nearest Chordal Tone Rule.** Parts should connect to the nearest chordal tone in the next sonority.

[D14.] **Part-Crossing Rule.** Avoid the crossing of parts with respect to pitch.

[D15.] **Pitch Overlapping Rule.** Avoid "overlapped" parts in which a pitch in an ostensibly lower voice is higher than the subsequent pitch in an ostensibly higher voice.

[D16.] **Semblant Motion Rule.** Avoid similar or parallel pitch motion between concurrent voices.

[D17.] **Parallel Motion Rule.** Avoid parallel motion more than similar motion.

[D7.] **Avoid Octaves Rule.** Avoid the interval of an octave between two concurrent voices.

[D8.] **Avoid Perfect Fifths Rule.** Avoid the interval of a perfect fifth between two concurrent voices.

[D9.] **Avoid Tonal Fusion Rule.** Avoid unisons more than octaves, and octaves more than perfect fifths, and perfect fifths more than other intervals.

[D10.] **Common Tone Rule.** Pitch-classes common to successive sonorities are best retained as a single pitch that remains in the same voice.

[D11.] **Conjunct Movement Rule.** If a voice cannot retain the same pitch, it should preferably move by step.

[C3.] **Avoid Leaps Rule.** Avoid wide pitch leaps.

[D18.] **Oblique Approach to Fused Intervals Rule.** When approaching unisons, octaves, or fifths, it is best to retain the same pitch in one of the voices (i.e., approach by oblique motion).

[D19.] **Avoid Disjunct Approach to Fused Intervals Rule.** If it is not possible to approach unisons, octaves and fifths by retaining the same pitch (oblique motion), step motion should be used.

[D20.] **Avoid Semblant Approach between Fused Intervals Rule.** Avoid similar pitch motion in which the voices employ unisons, octaves, or perfect fifths. (For example, when both parts ascend beginning an octave apart, and end a fifth apart.)

[D21.] **Parallel Unisons, Octaves, and Fifths Rule.** Avoid parallel unisons, octaves, or fifths.

[D22.] **Exposed Intervals Rule.** When approaching unisons, octaves, or fifths, by similar motion, at least one of the voices should move by step.
Part III: Perceptual Principles and Musical Genres

Onset Synchrony Principle

- If a composer intends to write music in which the parts have a high degree of perceptual independence, then synchronous note onsets ought to be avoided. Onsets of nominally distinct sounds should be separated by 100 milliseconds or more.

Asynchronous Preparation of Tonal Fusion Rule. When approaching unisons, octaves, or fifths, avoid synchronous note onsets.
Principle of Limited Density

- 8. If a composer intends to write music in which independent parts are easily distinguished, then the number of concurrent voices or parts ought to be kept to three or fewer.

Ability to track concurrent parts

Bach and the number of parts

Principle of Timbral Differentiation

- 9. If a composer intends to write music in which the parts have a high degree of perceptual independence, then each part should maintain a unique timbral character.
Wessel's illusion (Wessel, 1979)

- A sequence of three rising pitches is constructed using two contrasting timbres
- Two descending or one ascending?

Source Location Principle

- 10. If a composer intends to write music in which the parts have a high degree of perceptual independence, then it is helpful to separate in space the various sound sources for each part.
Conclusion

- 6 empirically established rules
- Non-traditional rules
- The unexplained
  - Exposed octaves & outer voices
  - Motivic & rhythmic – stream separation
  - Sense of direction and pitch successions
  - Nature & Nurture
- Aesthetics