Introduction to Harmony

Musical intervals that arise in a harmonic spectrum—especially the first few intervals in the spectrum—sound “pleasing” when played on instruments with a harmonic spectrum, like violins, flutes, or the human voice. Here are the first six frequencies in a harmonic spectrum and the intervals between them.

\[ f_0 \leftarrow \text{octave} \rightarrow 2f_0 \leftarrow \text{perfect fifth} \rightarrow 3f_0 \leftarrow \text{perfect fourth} \rightarrow 4f_0 \leftarrow \text{major third} \rightarrow 5f_0 \leftarrow \text{minor third} \rightarrow 6f_0 \]

The five interval classes above (octave, perfect fifth, perfect fourth, major third, and minor third) plus the inversions of these intervals (minor sixth and major sixth) are called consonant. All other interval classes are called dissonant.

An interval is consonant if its interval class number equals 0, ±3, ±4, or ±5.

Remember that \(-3 \equiv 9 \pmod{12}\) etc., so we can also list the the consonant interval class numbers as \{ 0, 3, 4, 5, 7, 8, 9 \}. This leaves five dissonant interval classes:

An interval is dissonant if its interval class number equals ±1, ±2, or 6.

Note that \(6 \equiv -6 \pmod{12}\), so all interval classes have been accounted for.

Exercise 13. Draw a pitch class circle and label the pitches in the C major scale. Connect the pitch classes that form consonant intervals.
EXERCISE 14. How many pitches classes are in the largest subset of the C major scale that contains only consonant intervals? List all the subsets of the C major scale that have this many notes and contain only consonant intervals.

EXERCISE 15. The major triad is the chord type of \{ 0, 4, 7 \} and the minor triad is the chord type of \{ 0, 3, 7 \}. Of the chords you listed, which are major triads and which are minor triads? Are any other chord types represented?

Here are some of the notes in a C major scale, shown on the treble clef staff.

EXERCISE 16. Describe the relationship between each note in the scale and the note two scale degrees after it. What happens if two people sing a scale in a round, with one person lagging two notes behind the other?