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Readers' Comments

Some Uses of Diatonic Interval Cycles for Recognizing Chord Inversion

David Pacun

Even good students sometimes have difficulty learning how to recognize chord inversions on paper. The two common devices, figuring out how the individual pitches form a stack of thirds (then counting the half-steps) or memorizing the seven basic triad types (some kind of A-C-E, B-D-F, C-E-G, etc.), are both time consuming and cumbersome. Recently I have had great success adapting John Clough's work on diatonic interval cycles to the problem of chord inversion.¹ Students need only memorize one 'fact' and follow three easy steps.

1) Create an extended diatonic thirds cycles, i.e. no sharps or flats.²

A - C - E - G - B - D - F - A - C - E (etc.)

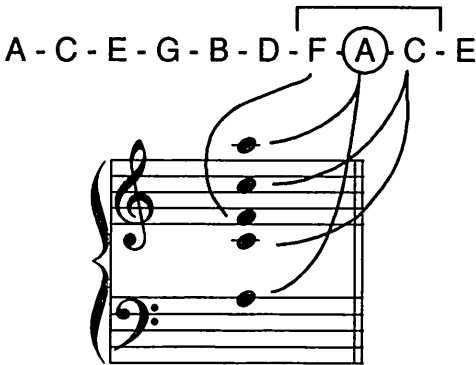
2) Map the notated pitches onto the thirds cycle, ignoring for the moment any sharps or flats in the music. The thirds cycle will automatically 'stack' the pitches in the correct order with the root on the left. (Students will have to remember to refer back to the music for sharps or flats in naming the exact triad.)

¹John Clough, "Aspects of Diatonic Sets," *Journal of Music Theory* 23/1 (1979): 45-61. John Clough, "Diatonic Interval Sets and Transformational Structures," *Perspectives of New Music* 18/2 (1979-80): 461-482. John Clough and Gerald Myerson, "Variety and Multiplicity in Diatonic Systems," *Journal of Music Theory* 29/2 (1985): 249-270.

²The extended cycle ensures that students will not run out of room and that the pitches will stack as thirds without having to wrap around the cycle. I would like to thank Paul Garstki of Goddard College for his help in preparing the examples.

3) Circle the lowest notated pitch; the first pitch (reading left to right) will indicate root position, the second pitch first inversion, the third pitch second inversion (see Ex. 1).

Example 1. Mapping a first inversion F triad onto a diatonic thirds cycle



This method works just as well with seventh chords, only circling the fourth pitch indicates third inversion. In simple textures, passing tones and neighbor notes between any two thirds will appear outside the 'stack of thirds' and thus be easily visible as nonharmonic tones (Ex. 2).

However, students will have to carefully evaluate more complex textures as well as neighbor tones 'below' the root or 'above' the fifth (as these will create two possible chord types) and passing and neighbor tones in seventh chords (see Exs. 3 and 4).

The diatonic thirds cycle will not automatically yield the proper chord quality, but can function well with standard tricks, i.e., that all *natural* fifths are perfect except B to F. These natural fifths are present in the diatonic thirds cycles and can be derived by extracting every other pitch.³ Since the outer interval in the triad is quickly

³Clough provides a formal description of extraction and its complement *interpolation* in "Diatonic Interval Sets," 476-77.

Example 2. Nonharmonic tone between the third and fifth

A - C - E - G - B - D - F - A - C - E

The diagram shows a sequence of ten notes: A, C, E, G, B, D, F, A, C, E. A bracket above the first four notes (A-C-E-G) indicates a chord. Below the notes is a single treble clef staff with a key signature of one flat (B-flat). The notes are placed on the staff as follows: A (below the staff), C (first space), E (second space), G (third space), B (below the staff), D (first space), F (second space), A (third space), C (fourth space), E (below the staff). Curved lines connect the notes to their positions on the staff. A bracket above the first four notes (A-C-E-G) indicates a chord. The notes G and B are connected to the staff by curved lines, showing they are not part of the chord indicated by the bracket above.

Example 3. Neighbor tone above the fifth

A or C?

A - C - E - G - B - D - F - A - C - E

The diagram shows a sequence of ten notes: A, C, E, G, B, D, F, A, C, E. A bracket above the first four notes (A-C-E-G) indicates a chord. Below the notes is a single treble clef staff with a key signature of one flat (B-flat). The notes are placed on the staff as follows: A (below the staff), C (first space), E (second space), G (third space), B (below the staff), D (first space), F (second space), A (third space), C (fourth space), E (below the staff). Curved lines connect the notes to their positions on the staff. A bracket above the first four notes (A-C-E-G) indicates a chord. The notes G and B are connected to the staff by curved lines, showing they are not part of the chord indicated by the bracket above. The note C is placed on the fourth space, which is above the G note, indicating it is a neighbor tone.

Example 4. Passing tone between the fifth and seventh

E or G?

A - C - E - G - B - D - F - A - C - E

The diagram shows a sequence of ten notes: A, C, E, G, B, D, F, A, C, E. A bracket above the first four notes (A-C-E-G) indicates a chord. Below the notes is a grand staff (treble and bass clefs) with a key signature of one flat (B-flat). The notes are placed on the staff as follows: A (below the bass staff), C (first space of bass staff), E (second space of bass staff), G (third space of bass staff), B (below the bass staff), D (first space of bass staff), F (second space of bass staff), A (third space of treble staff), C (fourth space of treble staff), E (below the bass staff). Curved lines connect the notes to their positions on the staff. A bracket above the first four notes (A-C-E-G) indicates a chord. The notes G and B are connected to the staff by curved lines, showing they are not part of the chord indicated by the bracket above. The note E is placed on the second space of the bass staff, which is between the G and B notes, indicating it is a passing tone.

calculated from the thirds cycle, students can develop their own tricks and short cuts in order to evaluate the inner intervals and hence the chord quality.

Using this method, my nonmajor music theory class has successfully navigated the first 25 measures of Bach's *C Major Prelude* (WTC I) with few or no errors and practically no confusion⁴ More importantly, students learn how to think about music structure on different levels—thirds and fifths—and how these different levels interact.⁵ This method is not fool proof and careful listening and ear training are still critical for understanding the musical point to inversion. Nevertheless, this method should allow students to grasp the basic mechanics and surmount the initial hurdles with ease.

⁴Measures 26-31 contain numerous suspensions over a dominant pedal—a difficult formation to grasp at sight for non-majors.

⁵One can also relate seconds (and hence sevenths) to the thirds and fifths through extraction or interpolation. I have my students memorize all possible diatonic interval cycles at the start of each semester. A quick analysis shows them how melodies tend to move by step, how chords are comprised of thirds, and how chords often progress by fifth.