

1-1-1987

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### Recommended Citation

Swain, Joseph P. (1987) "Connections in Modulations," *Journal of Music Theory Pedagogy*. Vol. 1, Article 3.

Available at: <https://digitalcollections.lipscomb.edu/jmtp/vol1/iss1/3>

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First Prize

## CONNECTIONS IN MODULATION

JOSEPH P. SWAIN

The traditional theory of modulation is founded on the pivot chord. To change from one key to another, a chord that belongs in the harmony of both keys is used to make a connection between them. Because this pivot chord can be interpreted in both keys, it smooths the transition from the first key to the second.

Despite the elegance of this theory, the pivot chord, taken by itself, does not seem enough to explain modulations and their wonderful effects. Modulations are among the most important harmonic events a tonal piece will contain, and are also among the largest. One may last many measures, and the music might require as long as a full minute to establish the second key firmly. How can we point to a single chord as the explanation of such modulations?

We could expand the idea of the pivot chord and think of pivot progressions or simply transitional passages, which are longer harmonic phrases, or even groups of phrases, that can be interpreted in both keys. This still seems insufficient, however, because modulations in Mozart, Beethoven, and Schubert are among the most striking moments of their music—and not despite the change of key but because of it. Explaining these effects by pointing out chords or progressions that are harmonically ambiguous is not enough, because harmonic ambiguity is easy to achieve, and there is no reason to consider it intrinsically beautiful.

On the other hand, the pivot-chord technique contains the very important notion of a connection between the keys involved in the modulation. One of the most basic intuitions we have about music is that it is a continuous process. When there is a change of key in a piece, composers have generally tried to maintain this sense of continuity, even though an important change in the music is occurring, so that the music doesn't have the sense of starting over whenever the key changes. This is why the idea of a pivot chord is attractive; since it can be interpreted in both keys at once, it explains how the tonal center of the

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music can change without causing any gross interruption in the continuity.

This idea of connection doesn't have to be limited to the pivot chord, nor to ambiguous passages. In the best modulations, other aspects of the music associated with the change of key can be used by the composer to create an intricate set of connections between the first key and the second. These connections are what must be studied to appreciate modulations in depth. Such modulations need not be complex or chromatic; they can be quite straightforward. As an example, take the second movement of Beethoven's Piano Sonata, Op. 14, no. 1. It is short, simple in form (A B A), and relatively easy to play. Yet, the modulations have an abundance of connections that help to make them the most memorable moments of the piece.

Beethoven begins this movement with the most conventional of phrase structures, the antecedent-consequent phrase. The first phrase of eight measures (the antecedent) presents a melodic idea with the underlying harmony moving from I to V by the end. The consequent phrase (mm. 9-16) begins in just the same way, moved up one octave, except that it ends with an authentic cadence (V-I). By this time, the tonic key of E minor is firmly established in the listener's ear (see Figure 1).

There is nothing extraordinary about the chords or harmonic functions in these phrases. All the chords, even the chromatic ones, act as we would expect. When the melody is considered in conjunction with the harmony, however, there are several observations to be made. First, Beethoven defines his principal motive right away by repeating it in the second measure. Moreover, while the motive remains exactly the same, the chord beneath it changes from E minor (i) to C major (VI), so that the motive is reinterpreted in a different harmony.

Second, the first important melodic motion, the leap from E up to G, is emphasized by Beethoven in several ways. The most obvious one is that he writes a *sforzando* dynamic marking at that place. He also introduces the first dissonant chromatic harmony of the movement, and this is quite striking after the easy triads of the opening measures. Both of these procedures underline the G in the top voice, and since this note continues as a suspension into the next measure (reinforced one octave below), it gains further weight. Evidently, Beethoven wants this motion from E to G to be noticed.

These characteristics are repeated in the consequent phrase, which ends with a strong cadence in E minor. Then there is a surprise (see Figure 2). Clearly there has been a modulation to C major. But this modulation, although perfectly clear to the ear, is puzzling for the

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analyst. Where is the transition chord, the pivot? And why go to C major from E minor, rather than to the more closely related and more conventional G major?

Figure 1. (mm. 1-16)

Figure 1 shows a musical score for the first 16 measures of a piece. The tempo is marked *Allegretto*. The score is in 3/4 time and E minor. The Roman numeral analysis below the score is as follows:

e: i VI V<sub>9</sub>/V V<sub>6</sub><sup>0</sup><sub>3</sub> i<sup>6</sup> V<sub>4</sub><sup>6</sup> i V<sup>6</sup> i

The analysis continues on the second line of music:

V i VI (etc.)

The third line of music shows the final part of the analysis:

i<sup>6</sup> V i

Figure 2. (mm. 17-24)

Figure 2 shows a musical score for the next 8 measures (mm. 17-24). The tempo is *Allegretto*. The score is in 3/4 time and C major. The Roman numeral analysis below the score is as follows:

C: I V ii V<sup>6</sup> I V V/V V

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As for a pivot, it is not too difficult to find one. The E-minor chord of measure 16 could be interpreted as *i* in E and *iii* in C; or, the C-major chord of measure 17 could be chosen as *VI* in E and *I* in C. While these possibilities seem reasonable on the page, however, neither makes much sense to the ear. It is very difficult to hear the first chord in C major at all, since it is a cadential chord, and it is the cadence, perhaps more than any other gesture in music, that defines the sense of key for listeners. Now this cadence is followed by two beats of rest, and this length of silence makes the next chord sound like something separate from the previous phrase. The mind is ready to interpret this chord in a new key, and so it is difficult to hear it as *VI* in E minor, although a dual interpretation is possible—much more so than for the other pivot.

The absence of an audible pivot chord is what makes this change of key so sudden and surprising. Yet, it doesn't sound wrong; on the contrary, it is a most effective gesture. Where are the connections? Why does this modulation surprise us in one way, and yet sound perfectly placed and prepared in another?

Beethoven has certainly provided musical connections of superb imagination, but to find them we must look beyond pivot chords to the material of the music itself. If you listen to the melody that is harmonized in C major, you should notice that Beethoven continues to use his principal motive, the same one that began the movement and is so closely associated with the key of E minor. Yet the connection is much stronger than that. All of the important melodic ideas of the beginning have been reworked in the key of C major. You can see from Figure 3 how close the correspondence is between the two melodies. Not only is the principal motive used as the foundation of both, we also have the important leap from E to G, emphasized by a *sforzando* in both cases.

Figure 3. Comparison of mm. 1-4 with 17-24

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It is essential to realize that Beethoven has not simply transposed his original melody into the key of C; anyone can do that. What he has done is to reinterpret the melody in a new key, while retaining important original pitches and significant aspects of melodic shape, even though the tonal center has changed. This reinterpretation has accounted even for small details. The D-sharp contained in the principal motive is heard as a diatonic neighbor note in the original key of E minor, and then as a chromatic neighbor note in the new key. Both interpretations work equally well.

This reinterpretation is the main connection between the keys of E minor and C major. This is why the modulation at measure 17 sounds surprising and abrupt, but so appropriate at the same time. Incidentally, this particular connection between keys has little to do with harmonic ambiguity. There is no sense, while we are hearing these melodies, each in its own key, that the key is undefined or unstable. Beethoven uses strong tonal chords, and there is never any doubt about what the tonic note is. Yet, as clearly as we hear the melody in E minor at the beginning, so do we hear it in C major in measure 17.

A detail of this melodic connection reveals why Beethoven chose C major as his contrasting key for this section of the movement, rather than the relative major. In the first two measures of the movement, the principal motive is played twice, as we observed, but the second time it is reinterpreted with a different harmony. The first chord is E minor and the second C major. In a sense, Beethoven has already shown us here how the modulation will work; the role of the principal motive as a connection between the keys of E minor and C major has been foreshadowed at the outset.

Notice that this melodic connection is not so pervasive as to destroy any distinction between the keys, as often occurs in Romantic music. The passage in C is not heard as a subsidiary progression or prolongation of E minor, but rather as an important tonal center in its own right. Beethoven is careful to include the chord of d minor (ii in C) early in his progression (m. 19). This is one chord in C that has little to do with the key of E minor, since it contains F-natural and D-natural, both unlikely tones in the context of E; and when we hear this chord, we are sure that the key has really changed. This is perhaps why the arrival of that chord is a particularly poignant moment.

Beethoven's use of a secondary dominant in measure 23 strengthens the following dominant harmony and with it our sense of the key of C. There is one thing left to do for the key of C major to have commensurate status with the home key of E minor: articulate it with a firm cadence, as was done with the first key. As Figure 4 shows,

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however, this does not happen. Although this phrase begins as if answering the previous phrase, the Italian-sixth chord in measure 30 returns the music to E minor with a half cadence in that key. This modulation is quite smooth and the use of a pivot-chord analysis in measure 29 would be quite appropriate, since that C chord, now in the middle of a phrase, can be heard as a submediant to the B-major dominant as well as its own tonic. However, Beethoven loses no opportunity to make the connection stronger than a simple harmonic pivot. The principal motive, harmonized with a C-major chord, is once again the bridge between the two keys—now reversed. Just as that motivic-harmonic combination functioned as the connection from E minor to C major, so now does it provide an effortless transition back from C to E minor.

Figure 4. (mm. 24-40)

Figure 4 shows a musical score for measures 24-40. The score is in 3/4 time and E minor. It consists of three systems of two staves each (treble and bass clef). The first system (measures 24-28) includes dynamic markings *sf*, *sf*, and *p*. The second system (measures 29-33) includes *p* and *sf*. The third system (measures 34-40) includes *sf*. Chord symbols are provided below the first system: C: I, I, V, ii, V<sup>6</sup>, e: I, VI, It<sup>6</sup>. The final chord in measure 40 is an Italian sixth chord (It<sup>6</sup>).

The Italian-sixth chord, too, is chosen for stronger reasons than harmonic convenience. Because it has a C in the bass, the connection between the two keys is continued, but the presence of A-sharp in the

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middle voice removes any doubt that the music is returning to E minor. Not once does A-sharp appear in the C-major passage (mm. 17-29), but it is quite prominent in the E-minor music, since it was the root of that important diminished-seventh chord introduced in measure three.

Having made an explicit contrast of keys that is so important to the classical style, Beethoven's purpose now is to bring the first section to a close in the home tonic. As we can easily hear, the next phrase after the half cadence is the antecedent phrase used in the beginning. We would expect the consequent phrase next, perhaps, but Beethoven is always sensitive to the proportions of his harmonic statements. The consequent phrase that he used before was satisfactory in establishing the key of E minor for the first time, but it won't be strong enough to end the first big section. Its conclusive properties need to be strengthened.

If that is the case, the next phrase seems to begin rather oddly. The principal motive is there, but the texture is thinned, with both hands in octaves, so that there is no longer a full E-minor triad (see Figure 5). The following C chord is also incompletely spelled. The next chord (m. 43) is a complete surprise, an incomplete minor seventh which highlights a high C, and whose D-natural and F-natural recall that special D-minor chord of measure 19. Is this another modulation to C?

Figure 5. (mm. 40-51)

Harmonic analysis for Figure 5:

Measure 40: e: i

Measure 41: VI

Measure 42: ?

Measure 43:  $V^0_{\frac{4}{3}}/iv$

Measure 44: iv

Measure 45: (etc.)

Measure 46: iv

Measure 47:  $i^6_{\frac{6}{4}}$

Measure 48: V

Measure 49: i

This is a good example of the harmonic meaning of a passage becoming clear only after it has gone by, clarified by subsequent events. Here, the high C, while perhaps recalling the previous modulation,

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acts like a suspension in the next measure, and the mysterious seventh is revealed as a diminished seventh moving to an A-minor resolution (m. 45). This progression is repeated twice, and then it moves on to a very emphatic authentic cadence in E minor (mm. 48-51).

Now we can see what has happened. Beethoven has indeed strengthened the conclusive aspects by lengthening the phrase, and prolonging, or stretching out, its important chords, namely iv (A minor), V (B major), and i (E minor). The prolongation of iv is like a minuscule modulation to A minor; that is why the diminished-seventh G-sharp-B-D-F is introduced, acting as a temporary dominant. That is also why the texture is thinned at the beginning of the phrase. Beethoven undermines the E-minor beginning in order to prolong the A-minor chord. In particular he removes all the Gs, which of course discourage any perception of A. The mysterious minor seventh in measure 43 does in fact recall measure 19, but also functions as iv in A minor.

Beethoven makes the conclusion even stronger by prolonging the final tonic chord. Notice in Figure 6 that the bass note never moves from the note E. Meanwhile, within this long bass tonic pedal, there are little cadences made by the inner voices. Notice that these do not employ the progression V-I, but instead use a diminished seventh, perhaps because that chord contains a C-natural, another reminder of the important structural relationship the pitches E and C have for this movement.

Figure 6. (mm. 51-62)

The musical score for Figure 6 (measures 51-62) is presented in two systems. The first system shows measures 51-53. The bass line has a long tonic pedal on E. Chord symbols below the staff are 'e:', 'V 6/4 2', and 'i (etc.)'. The second system shows measures 54-62. Dynamics markings include 'sf', 'p', 'pp', and 'cresc.'.

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Now that the first part of this ternary movement has concluded firmly in E, it should be no surprise that Beethoven chooses the key of C major for the middle section. Finally, this alternative tonal center to E has achieved the structural status that was so carefully prepared, but unrealized, in the first section. In retrospect, we can see how Beethoven gradually increased the importance of this pitch. At first, it was simply an alternative chord (m. 2); then, a contrasting key, but one without a firm cadence (mm. 17-29); and finally, a tonality governing a section in its own right. In this way, the cumulative contrasts between the two keys do not seem forced, but grow out of the music itself.

Figure 7. (mm. 63-100)

*Maggiore*

C: I V<sup>5</sup> I V I V<sup>5</sup> I

I V VI V<sup>6</sup> IV<sup>6</sup> V<sup>6</sup>/vi vi ii<sup>6</sup>  
G: ii vii<sup>06</sup> I

V<sup>7</sup> I

*p cresc.* *decresc.*

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Figure 7. con't.

C: I V<sup>6</sup> I

I vi<sup>6</sup>  
e: iv<sup>6</sup> i<sup>4</sup> V

The transition consists of a single E, sustained (m. 62), and then the C chord is filled out beneath it to begin the section. We accept this without question as a real change of key, because we have heard the likes of it several times before. Now that Beethoven is composing a section in C major, he will want to make connections in reverse, reminding the listener of the key of E while in the context of C. We can hear several such reminders within the first repeated strain (see Figure 7).

First, the comparison of the first phrase of the new melody with that of the original shows a similar shape. Both begin on E, rise to an emphasized G, then fall back to E again (see Figure 8). If this new melody is heard, even subconsciously, as a reinterpretation of the original, the original key will be recalled, by association, with the melody.

Second, we should notice that the new melody is somewhat chromatic, containing several chromatic passing tones in measures 66 and 70. However, if we consider the keys of E minor and C major, there are two important notes that differentiate the former from the latter: F-sharp, which is the second degree of E minor and which is included in the key signature, and D-sharp, the leading tone. These are precisely the chromatic pitches that Beethoven introduces into his C-major melody. In one way they are heard as simple passing tones, but in another they are heard as another connection with the alternative key.

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Finally, the passage modulates to G major, a conventional goal for a section composed in C major, to be sure, but also one that reminds us of the important role of the pitch G, especially at the beginning of the piece. The modulation to G is quite straight-forward, but it is interesting to note that Beethoven uses a single secondary-dominant relationship in his transition passage (m. 74), the V of vi, another tiny reminder of E.

Figure 8. Comparison of mm. 1-4 with 63-71

Figure 8 consists of two musical staves. The top staff is labeled *Allegretto* and shows a melodic line in G major (one sharp) with a 3/4 time signature. It contains measures 1-4 and 63-71, with a long slur spanning from the first measure to the end. The bottom staff is labeled *Maggiore* and shows a piano accompaniment in G major (one sharp) with a 3/4 time signature, also containing measures 1-4 and 63-71, with a long slur spanning from the first measure to the end.

Figure 9. (mm. 101-116)

Figure 9 consists of two musical staves. The top staff is labeled *Coda* and shows a melodic line in G major (one sharp) with a 3/4 time signature, containing measures 101-116. The bottom staff shows a piano accompaniment in G major (one sharp) with a 3/4 time signature, also containing measures 101-116. The piano part includes dynamic markings *p* and *pp* and features a double bar line with repeat dots at the end of the section.

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The middle section concludes with a transitional passage that prepares the return of the opening section. As we would expect, the transition is based upon the E-C relationship. The passing tone D-sharp is reiterated in the high register (m. 96); and the following E is harmonized by a C chord. This acts as a pivot chord and moves easily to V of E minor. This passage is heard again when the piece reaches the coda (see Figure 9). Here Beethoven wants to make a stark contrast between the two keys in a short span of time, in effect, summarizing the relationship that has been the foundation of the movement.

In this short, apparently simple, movement, Beethoven has shown that modulations are rather more complex events than single points of harmonic ambiguity. They can be implied and prepared by foregoing events in the music and recalled by subsequent ones. They can have connections with musical aspects that are not essentially harmonic, such as principal motives and themes, or rhythmic gestures. In the best music these various and intricate connections are superbly co-ordinated in moments of great beauty. In this way modulations, as large and important events in tonal pieces, can be appreciated as something more than mechanical manipulations of chords; they are, in fact, structural events of the highest art and imagination.