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The Backcycle Progression - A Supplement to the Omnibus Progression for the Study of Chromatic Harmony

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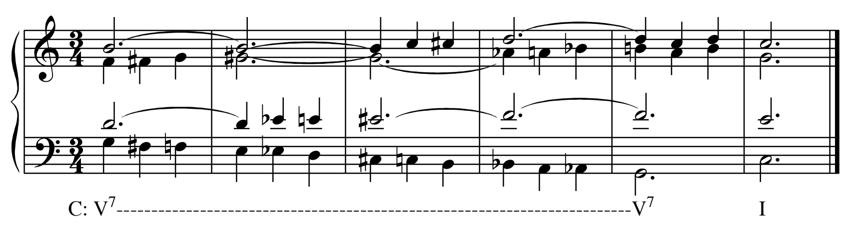
Introduction

Appearing in numerous undergraduate theory textbooks, the omnibus progression is a standard topic in the study of chromatic harmony and enharmonicism.[2] While the progression has several variants, three current textbooks use the progression in Example 1 as a keyboard harmony exercise.



Example 1. Omnibus progression in three current textbooks.

Each textbook provides the student with different instructions. Gauldin asks the student to "play this progression then transpose it to two other keys of your choice."[3] Aldwell, Schachter, and Cadwallader instruct the student to play every keyboard progression in their book "through at least the first four sharp and flat keys, major and minor."[4] In an exercise titled "Driving the Omnibus,"

[1] I wish to thank Steven Laitz, Edward Pearsall, Matthew Santa, and the anonymous *JMTP* readers for their valuable suggestions. I also thank Joseph N. Straus for permission to reproduce the diagram in Example 22.

[2] Aldwell, Schachter, and Cadwallader (2011, 638), Benward and Saker (2003, 227-28), Clendinning and Marvin (2011, 620), Gauldin (2004a, 746-49), Kostka, Payne, and Almén (2013, 444-46), Laitz (2012a, 641-42, 644). Relevant non-textbook sources include Gauldin 2004c, Telesco 1998, and Yellin 1998.

[3] Gauldin (2004b, 459).

[4] Aldwell, Schachter, and Cadwallader (2011, 670, 690).

Laitz asks the student not only to transpose the progression, but also to demonstrate the enharmonic equivalence between the major-minor seventh chord and the German augmented sixth chord. His instructions read, "Play the progression in keyboard style as written, and then transpose to the key of F major (you'll be starting on C^7 since this omnibus expands the dominant). Then try leaving the sequence at various points, treating the first chord of any measure as a V^7 or as a Ger^6."[5] When the first chord acts as V^7, Laitz asks the student to resolve it directly to I; when the first chord acts as Ger^6, the student is to follow it with the cadential progression V^{6-5}_{4-3} - I.

In "Brain Twister," the keyboard exercise that follows "Driving the Omnibus," Laitz further drills the concept of enharmonic equivalence between V^7 and Ger^6, asking the student to use E♭-G-B♭-D♭ (or its enharmonic equivalent) "in at least two different ways. Recall that enharmonic changes permit different harmonic destinations."[6] In addition, Laitz includes the sonorities C♯-E-G-B♭ and C-D-F♯-A♭. With C♯-E-G-B♭, Laitz drills enharmonic modulation with the fully diminished seventh chord. With C-D-F♯-A♭, Laitz demonstrates the enharmonic equivalence shared by V^7 with a lowered fifth (e.g. A♭-C-E𝄫-G♭ as $V^{\circ 7}$ in D♭) and the French sixth (Fr^6) chord (e.g. A♭-C-D-F♯ as Fr^6 in C).[7]

The present paper introduces numerous variations to the Example 1 omnibus progression with the goal of deepening the student's theoretical and analytical command of enharmonic transformation and enharmonic modulation. I begin by reviewing the enharmonic equivalence shared by V^7 and Ger^6, and present a *tritone network* to represent the equivalence (Examples 1-6). I then introduce the *backcycle progression*, a harmonic sequence containing root-position major-minor seventh chords with root motion by descending fifth. This prompts the addition of two new tritone networks (Examples 7-14). Next, I discuss a version of the backcycle progression containing a chromatic descending bass line (Examples 15-17). Two summary examples from Chopin Mazurkas then follow (Examples 18-19). In the final section of the paper, I point out aspects of the

5 Laitz (2012b, 449).

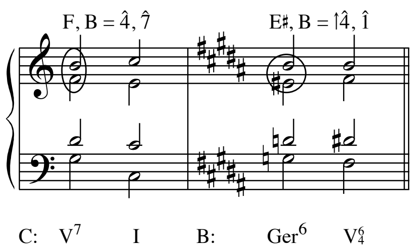
6 Laitz (2012b, 449).

7 $V^{\circ 7}$ indicates a V^7 chord with a lowered fifth; $V^{\circ 6}_{5}$, $V^{\circ 4}_{3}$, and $V^{\circ 4}_{2}$ inversions appear as well. I use the locution "in X" as shorthand for "in the parallel keys of X major and X minor."

backcycle progression that foreshadow topics typically covered in undergraduate post-tonal theory textbooks, including interval cycles, pitch-class integers, parsimonious voice leading, atonal pitch space, and transformational voice leading (Examples 20-22).

Preliminaries: A First Tritone Network

Nearly every textbook that covers the enharmonic equivalence of V[7] and Ger[6] stresses the respelling of the minor seventh interval in V[7] as an augmented sixth interval in Ger[6].[8] The minor seventh interval involves $\hat{5}$ and $\hat{4}$; the latter resolves down by step to $\hat{3}$ while the former holds as a common tone. The augmented sixth interval, involving $\downarrow\hat{6}$ and $\uparrow\hat{4}$, resolves to $\hat{5}$ in both voices.[9] Example 2 demonstrates another enharmonic transformation that takes place between these harmonies, one that is generally overlooked.



Example 2. Enharmonic transformation of the tritone interval.

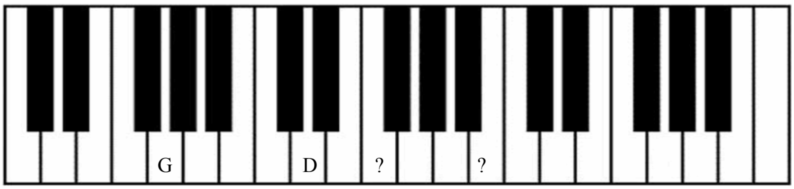
The transformation involves the tritone interval in each chord. As indicated by the circle in m. 1, the tritone of V[7] in C is spelled with F as $\hat{4}$ and B as $\hat{7}$. As indicated by the circle in m. 2, when V[7] in C is reinterpreted as Ger[6] in B, the tritone is respelled with E♯ as $\uparrow\hat{4}$ and B as $\hat{1}$. Example 3 displays a keyboard diagram that indicates G and D, the notes shared by V[7] and Ger[6], but labels the notes of

[8] Aldwell, Schachter, and Cadwallader (2011, 583), Benjamin, Horvit, and Nelson (1997, 158), Clendinning and Marvin (2011, 630-33), Gauldin (2004a, 552), Kostka, Payne, and Almén (2013, 395), Laitz (2012a, 485-87), Roig-Francolí (2011, 579-80). Biamonte (2008, §3, 4, 7 and Example 6) is a relevant non-textbook source.

[9] I use a downward-pointing arrow to indicate a lowered scale degree and an upward-pointing arrow to indicate a raised scale degree.

the tritone with question marks. This encourages the student to determine enharmonically-equivalent spellings for the tritone.[10]

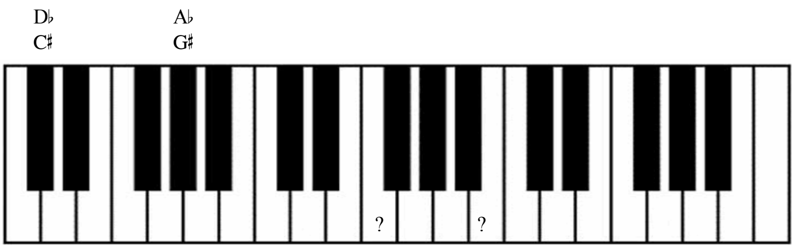
"?" indicates that the spelling of the note is to be determined by the student.



Example 3. Keyboard diagram illustrating the tritone.

A second feature of the keyboard diagram is the ease with which it leads students to discover that there is a *second* pair of V^7/Ger^6 chords that contain the same tritone. Example 4 illustrates that the tritone in Example 3 acts as $\hat{4}$ and $\hat{7}$ not only in C, but in F♯ (or G♭) as well.

"?" indicates that the spelling of the note is to be determined by the student.



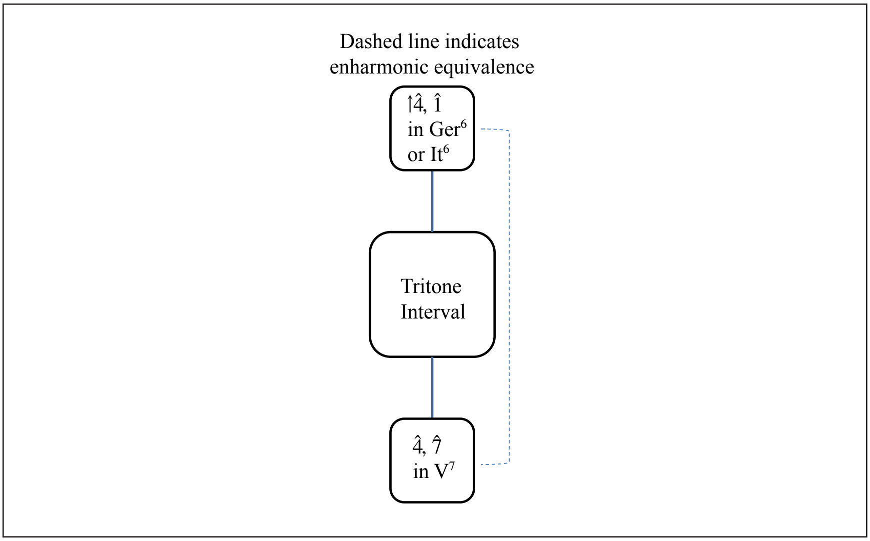
Example 4. Another V^7/Ger^6 pair that contains the same tritone.

Here, the student holds the tritone in the right hand, and locates a second perfect fifth (one other than G/D) with the left hand. In this case, the spelling of the tritone changes to E♯/B (in F♯) or F/C♭ (in G♭). Similarly, the same tritone acts as $\uparrow\hat{4}$ and $\hat{1}$ not only in B, but in F as well. In this case, the spelling of the tritone changes to F/B♮. In summary, the tritone can form part of a V^7 chord in two tritone-related keys (here C and F♯/G♭), and part of a Ger^6 chord

[10] I use the term "note" in place of the more precise but awkward "pitches that are octave-equivalent but not enharmonically-equivalent."

in two tritone-related keys (here B and F). Students versed in jazz harmony will recognize the tritone-related keys as a phenomenon akin to tritone substitution.[11]

Example 5 summarizes the preceding observations in a diagram that I will refer to as a *tritone network*.

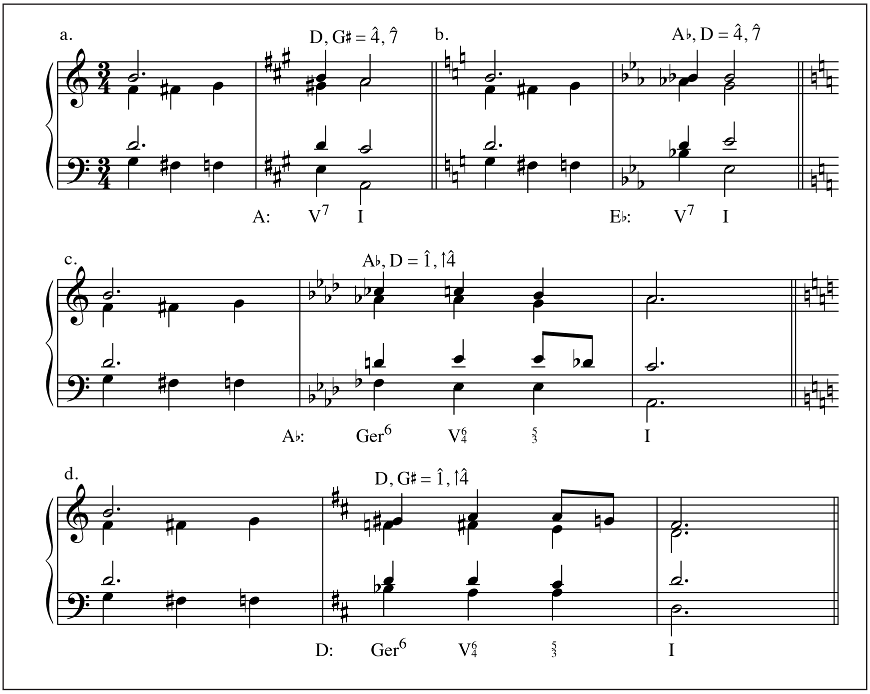


Example 5. Tritone network for V^7, Ger^6, and It^6 chords.

It conveys that a tritone interval may realize $\uparrow\hat{4}$ and $\hat{7}$ in V^7 (this is the pair of tritone substitutes), or $\uparrow\hat{4}$ and $\hat{1}$ in Ger^6. $\uparrow\hat{4}$ and $\hat{1}$ can also realize two of the three scale degrees in an Italian sixth chord (It^6) because It^6 is a subset of Ger^6. Tritone networks will prove useful for keeping track of the ways in which a tritone interval can participate in various harmonies.

Shifting the focus from the minor seventh or augmented sixth interval in V^7 or Ger^6 to the tritone interval offers a new perspective on Laitz's "Driving the Omnibus." As an illustration, please see Example 6.

[11] Gauldin (2004a, 546-47), Roig-Francolí (2011, 567), Spencer (2004, 352), Tymoczko (2011, 360-65).



Example 6. Four resolutions for Laitz, "Driving the Omnibus," bar 2, beat 1.

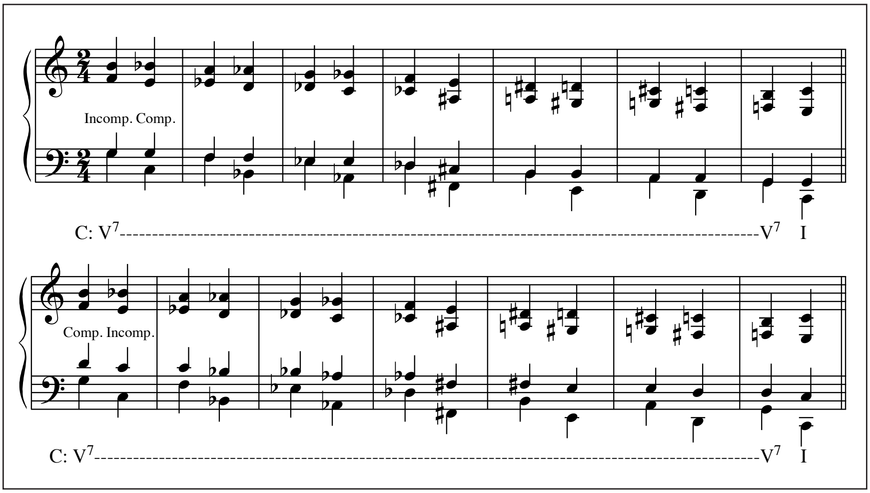
The example reproduces m. 1 of Laitz's progression, followed by four resolutions for the chord on beat one of m. 2. They are: 1) V^7- I in A; 2) V^7 - I in E♭; 3) Ger^6 - V^{6-5}_{4-3} - I in A♭; 4) Ger^6 - V^{6-5}_{4-3} - I in D.[12] As illustrated by Example 6, the student should always use the same exact keys on the keyboard for the tritone in the fourth chord; this facilitates the process of determining multiple resolutions.

In the next section of the paper, I introduce and develop another context for the enharmonic reinterpretation of V^7 and Ger^6. The root-position backcycle progression will provide a new setting for exchanging these harmonies, as introduced in "Driving the Omnibus," and will also accommodate the enharmonic transformations of $vii^{\circ 7}$ and $V^{\circ 7}$/Fr^6 that Laitz describes in "Brain Twister."

[12] In Examples 6b and 6d, the chordal seventh of the third chord (F♮) does not resolve down by step.

The Root-Position Backcycle Progression; Two Additional Tritone Networks

Example 7 presents the root-position backcycle progression. The outer voices form a 10-7 linear intervallic pattern.[13] The top staff alternates between incomplete (no fifth) and complete voicings, in that order. The bottom staff alternates between complete and incomplete voicings, in that order.[14]



Example 7. The backcycle progression.

Like most sequences, the backcycle progression goes by several names in current textbooks and anthologies. Aldwell, Schachter, and Cadwallader, as well as Burkhart and Rothstein, refer to it as a "descending fifths sequence with applied chords and interlocking sevenths."[15] Roig-Francolí refers to it as a "descending fifths sequence with secondary dominants."[16] Laitz refers to it as an example of "applied V^{7}s in a descending second

[13] The term "linear intervallic pattern" first appears in Forte and Gilbert (1982, 83-102).

[14] Roig-Francolí (2011, 431) discusses the voice-leading issues attendant with this progression, and suggests alternating between complete and incomplete chords to prevent "irregular resolution of the leading tone and the seventh."

[15] Aldwell, Schachter, and Cadwallader (2011, 704), Burkhart and Rothstein (2012, 660).

[16] Roig-Francolí (2011, 429-31).

(descending fifth/ascending fourth) sequence with interlocking sevenths."[17] Kostka, Payne, and Almén refer to it as "a series of major-minor seventh chords in a circle-of-fifths sequence."[18] Clendinning and Marvin refer to it as "dominant seventh harmonies in a descending fifth sequence."[19] Jazz musicians refer to it as an example of *backcycling*, so named because the chord roots move counterclockwise ("backwards") on the circle (cycle) of fifths.[20] I will refer to this progression as the backcycle progression, and will use the verb *backcycle* in a manner akin to Laitz's use of the verb "drive" in "driving the omnibus."

The backcycle progression shares a number of features with the omnibus in Example 1. Both root progressions divide the octave equally (the omnibus bass line by minor seconds from beat to beat, or minor thirds from downbeat to downbeat; the backcycle bass line by perfect fifths from beat to beat); each prolongs a single dominant seventh harmony when played in its entirety; both are heavily chromatic; and both feature semitonal voice leading (the omnibus in all voices, the backcycle in the upper voices). What distinguishes the backcycle progression is its distillation of the possibilities for enharmonic transformation present in the omnibus. That is, by omitting the passing $^6_4$ chords in the omnibus, which do not invite enharmonic reinterpretation, *any* chord in the backcycle progression may serve as a launching pad for enharmonic reinterpretation and subsequent cadential resolution.[21]

Examples 8 and 9 provide examples from the literature that illustrate the potential for enharmonic transformation latent in each chord of the backcycle progression.[22]

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[17] Laitz (2012a, 364).

[18] Kostka, Payne, and Almén (2013, 272).

[19] Clendinning and Marvin (2011, 440).

[20] Backcycling is discussed in many jazz theory textbooks, including Fisher (1995, 44), Greene (1971, 78-80), Marohnic (2000, 37-39), Rawlins and Bahha (2005, 61), and Scott (2003, 58, 236, 478).

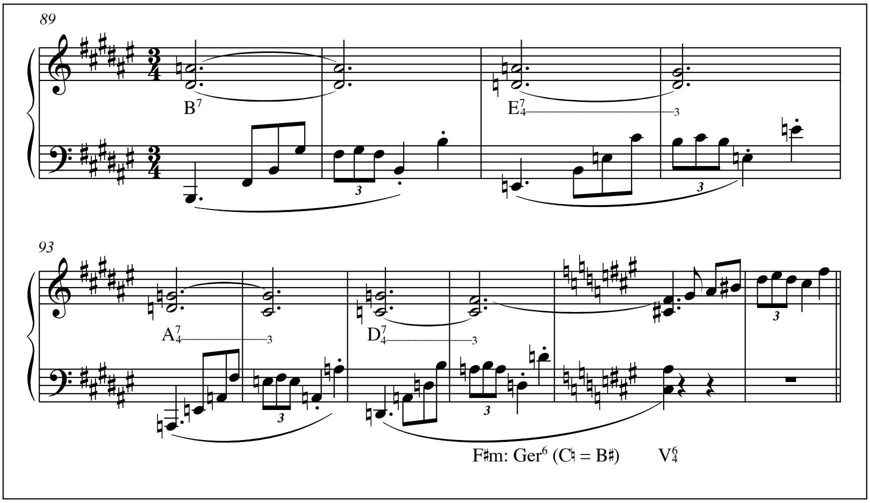
[21] Examples of the root-position backcycle progression appear in Burkhart and Rothstein (2012, 175, m. 9; 381, m. 13); Aldwell, Schachter, and Cadwallader (2011, 485-86 (Chopin); 704 ("sequences with applied chords")); and Kostka, Payne, and Almén (2013, 273).

[22] The Example 8 passage is discussed by Gauldin (2004a, 667-68), Roig-Francolí (2011, 441) and Clendinning and Marvin (2011, 542-43).

Example 8. Mozart, String Quartet in D minor, K. 421, III.

Example 8 reproduces a passage from a Mozart string quartet. The passage begins with a series of major-minor seventh chords whose roots descend by perfect fifth: E-A-D-G-C-F. A final descending fifths motion alights on a B♭ major triad, not a major-minor seventh harmony (m. 27). As B♭ holds in the lowest voice, the highest voice descends to G♯, forming an augmented sixth interval in the outer voices. The inner voices flesh out the augmented sixth interval with Ger^6 and It^6 harmonies. The passage ends on a half cadence (HC) in D minor, the key of the movement.

The latter authors read a Fr^6 chord on beat two of m. 28, viewing C♯ as a lower neighbor to D.



Example 9. Chopin, Mazurka 38 in F♯ minor, Op. 59, No. 3.

Example 9 reproduces a passage from a Chopin Mazurka. As does the Mozart, the Chopin begins with a series of major-minor seventh chords whose roots descend by perfect fifth: B-E-A-D. However, the Chopin passage introduces a notational twist. Despite its spelling as D-F♯-A-C♮, the D chord acts as Ger^6 in F♯ minor, such that the notated C♮ functions as B♯. The following cadential $^6_4$ chord harmonizes the return of the work's opening motive and resolves to root-position tonic harmony in F♯ minor, the key of the entire piece. In summary, while the notation of each backcycle sonority in Example 8 reflects its function as a V^7 or Ger^6, the notation of the final backcycle sonority in Example 9 (D-F♯-A-C♮) does *not* reflect its function. Such discrepancies often arise in common-practice tonal music.

Let us return to the backcycle progression in Example 7. It may be put to several uses prior to enharmonic reinterpretation. After playing the progression in its entirety as a prolongation of V^7 in C, the instructor may ask the student to backcycle to, say, an imperfect authentic cadence (IAC) in E♭. In this case, the progression does not *prolong* V^7 in C, but rather *progresses* to the key of E♭.[23] Example 10a provides a straightforward solution.

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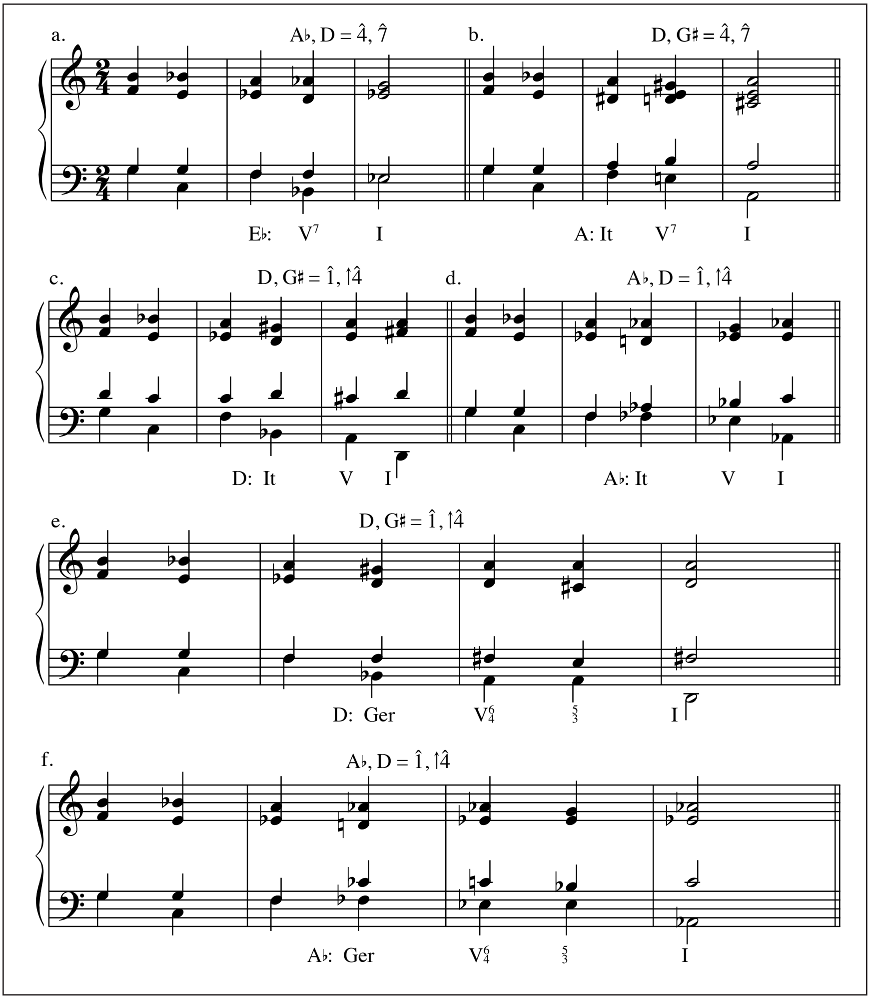
[23] Laitz (2012a, 808) draws the important distinction between sequences that prolong a single harmony, versus sequences that progress from one harmony (or key) to another. See also Clendinning and Marvin (2011, 440).



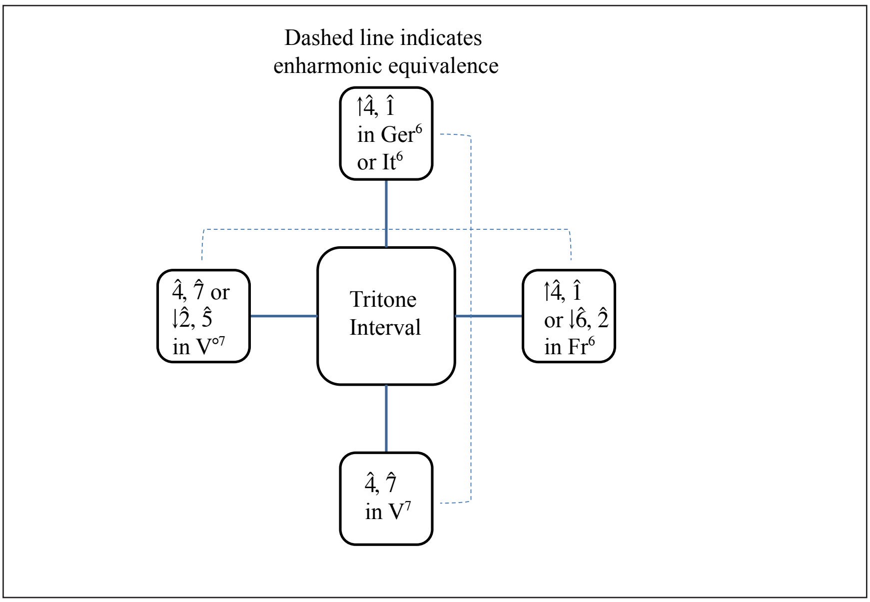
Example 10. Resolving the fourth chord in the backcycle progression.

After playing the first three chords as written, the student would treat the fourth chord as V^7 in E♭. In this case, the tritone in the fourth chord acts as $\hat{4}$ and $\hat{7}$ in E♭ (spelled as A♭/D). By resolving the chordal seventh down by step, an IAC results.

A first enharmonic transformation will treat the fourth chord as V^7 in the tritone-related key of A. Example 10b offers an illustration. The chordal tritone will be respelled as $\hat{4}$ and $\hat{7}$ in A (D/G♯). The bass note B♭ will be replaced by E. This time, the cadence will be perfect authentic (PAC) to resolve the leading tone in the soprano up by step.

Having resolved the D/G♯ or D/A♭ tritone as part of two dominant seventh chords, we can proceed to resolving it as part of two It^6 or Ger^6 chords. In Example 10c, the fourth chord functions as It^6 in D. The tritone is spelled as D/G♯ to function as $\hat{1}$ and $\uparrow\hat{4}$. Notice that Example 10c begins with a complete chord voicing; this permits smooth voice leading from FMm^7 to It^6. In Example 10d, the tritone functions as $\hat{1}$ and $\uparrow\hat{4}$ in A♭, as part of an It^6 chord preparing a PAC in that key. Examples 10e and 10f treat the fourth chord as Ger^6 in D and A♭ respectively, thereby exhausting the possibilities presented by the tritone network.

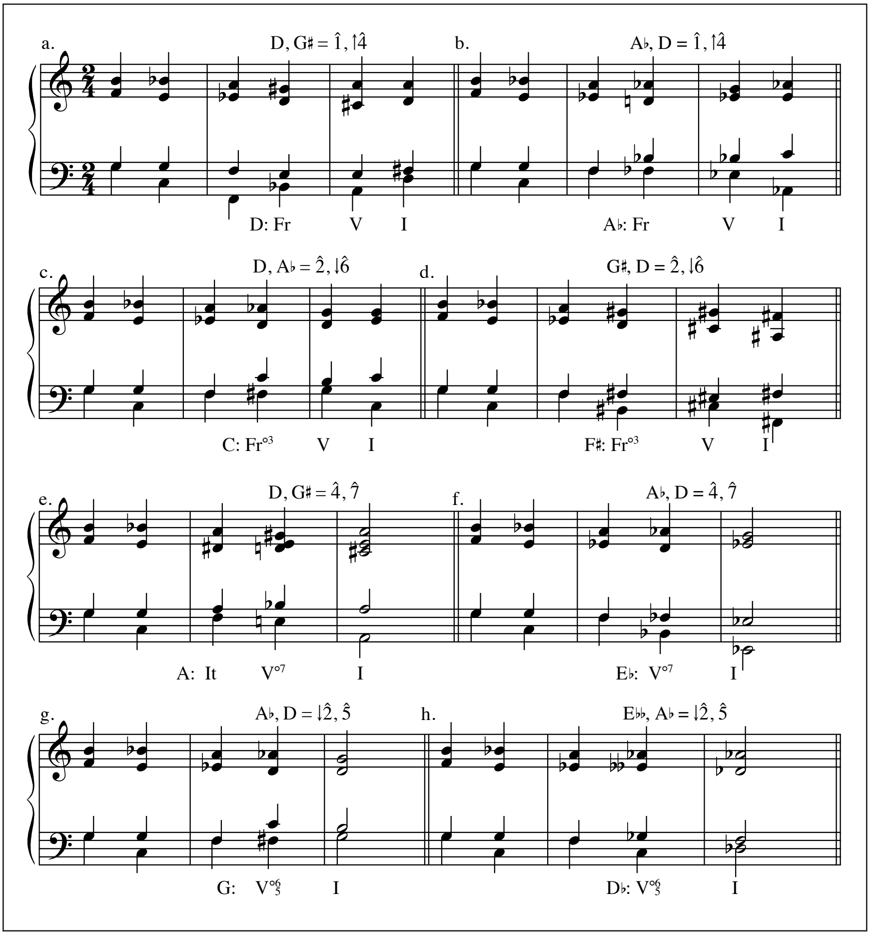
Example 11 expands the tritone network to accommodate the Fr^6 and V$^{\circ 7}$ chords in Laitz's "Brain Twister."[24]



Example 11. Adding the Fr^6 and V$^{\circ 7}$ harmonies to the tritone network.

Whereas the Ger^6, It^6, and V^7 harmonies each contain one tritone, the Fr^6 and V$^{\circ 7}$ chords each contain two. For this reason, each tritone in Fr^6 can act as $\uparrow\hat{4}$ and $\hat{1}$, or as $\downarrow\hat{6}$ and $\hat{2}$. Examples 12a-d illustrate these resolutions for Fr^6, using the fourth chord of the backcycle progression as the exit point.

[24] Laitz (2012a, 672-74) discusses the roles of Fr^6 and V$^{\circ 7}$ in a work by Scriabin.



Example 12. Resolving the fourth chord using Fr^6 or $V^{\circ 7}$.

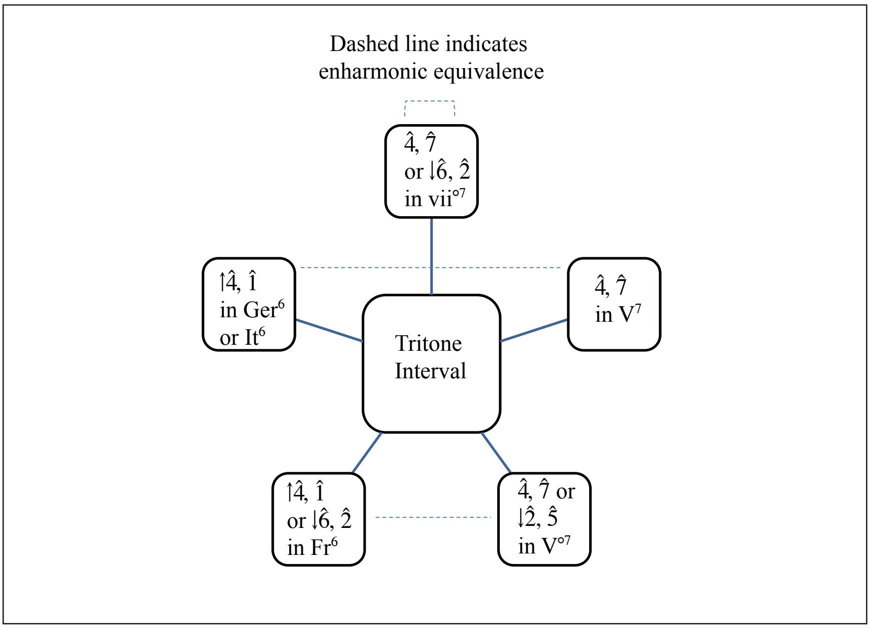
In Example 12a, the tritone D/G♯ acts as $\hat{1}$ and $\uparrow\hat{4}$ in D major. In Example 12b, this tritone is spelled as A♭/D♮ to form $\hat{1}$ and $\uparrow\hat{4}$ in A♭ major. Examples 12c and 12d treat the same tritone as $\downarrow\hat{6}$ and $\hat{2}$ in C and F♯, respectively. Here, $Fr^{\circ 3}$ appears in place of Fr^6 so that the D/A♭ or D/G♯ tritone may remain fixed in the right hand.[25]

Examples 12e-h illustrate resolutions for the $V^{\circ 7}$ chord. Each tritone in $V^{\circ 7}$ can act as $\hat{4}$ and $\hat{7}$ (as in the unaltered V^7) or as $\downarrow\hat{2}$ and $\hat{5}$. In Example 12e, the tritone D/G♯ acts as $\hat{4}$ and $\hat{7}$ in A major; in Example 12f, it is spelled as D/A♭ to form $\hat{4}$ and $\hat{7}$ in E♭ major. Examples 12g and 12h treat the same tritone as $\downarrow\hat{2}$ and $\hat{5}$ in G and D♭, respectively. Similar to Examples 12c and 12d, $V^{\circ 6}_{5}$ appears in

[25] Additional keyboard exercises involving "inverted" augmented sixth chords appear in Brings et al (1979, 111).

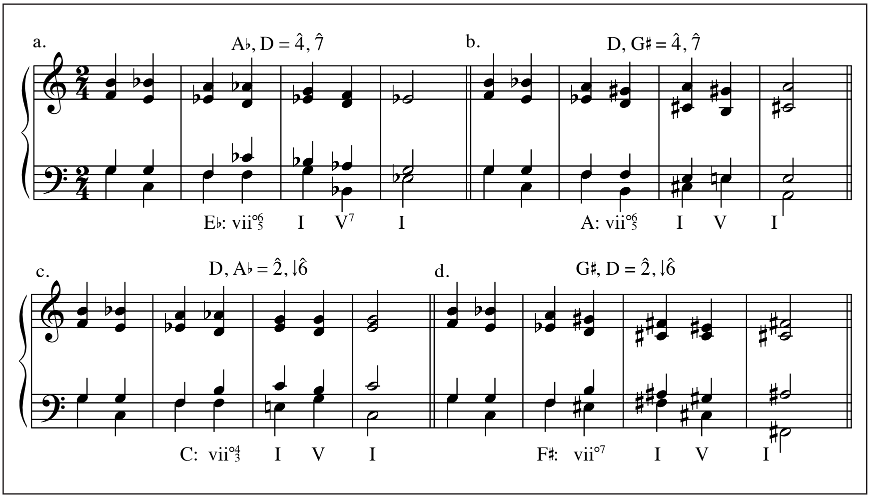
place of V°[7] so the D/A♭ or E𝄫/A♭ tritone may remain fixed in the right hand. This wraps up the possibilities presented thus far for resolving the fourth chord, and indeed any chord, in the backcycle progression: as V^7, Ger^6, or It^6 (following the first tritone network in Example 5), and Fr^6, $Fr^{\circ 3}$, $V^{\circ 7}$, or $V^{\circ 6}_{5}$ (following the second tritone network in Example 11).

Example 13 presents a third tritone network that accommodates enharmonic modulations using the diminished seventh chord, the last sonority in Laitz's "Brain Twister."



Example 13. Adding $vii^{\circ 7}$ to the tritone network.

Like the $V^{\circ 7}$ and Fr^6 chords, the diminished seventh chord contains two tritones. Each tritone can function as $\hat{4}$ and $\hat{7}$ in two tritone-related keys (as in the unaltered V^7 chord) or as $\hat{2}$ and ↓$\hat{6}$ (as in the Fr^6 chord), also in two tritone-related keys. Example 14 illustrates these scale degree functions, using the fourth chord of the backcycle progression as the exit point.



Example 14. Resolving the fourth chord using vii°7 and its inversions.

As in Examples 6, 10, and 12 previously, I will continue to exit the backcycle progression on the fourth chord. Examples 14a and 14b treat the D/A♭ or D/G♯ tritone as $\hat{4}$ and $\hat{7}$ in E♭ and A, respectively. Examples 14c and 14d treat this tritone as $\hat{2}$ and $\downarrow\hat{6}$ in C and F♯ respectively. It is important to point out that there are multiple possibilities for the bass note of each diminished seventh chord. For example, in Example 14a, the bass note could also be C♭, forming $\text{vii}^{\circ 4}_{2}$. The choice of $\text{vii}^{\circ 6}_{5}$ instead of $\text{vii}^{\circ 4}_{2}$ is based on two factors: the bass note F is maintained from beat one to beat two and, generally speaking, $\text{vii}^{\circ 4}_{2}$ is less common than $\text{vii}^{\circ 6}_{5}$.[26] These factors also guide the choice of bass notes and chordal inversions in Examples 14b, c, and d.[27]

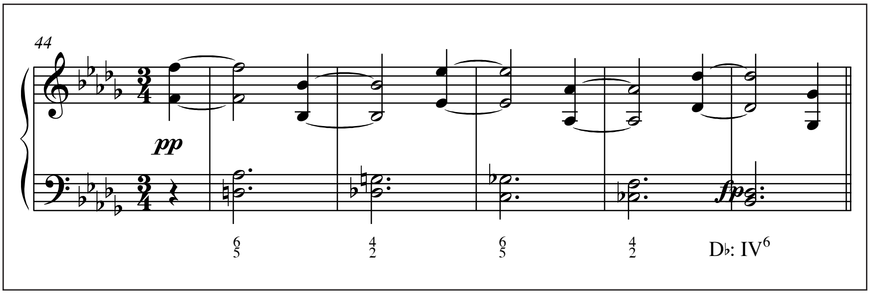
The Backcycle Progression with Chromatic Bass Line

When the major-minor seventh chords in the backcycle progression are inverted so as to alternate between $^6_5$ and $^4_2$ positions (beginning on either), a descending chromatic bass line results,

[26] Aldwell, Schachter, and Cadwallader (2011, 427); Roig-Francolí (2011, 359).

[27] The diminished seventh chords in Examples 14 and 15 may form a bridge to other versions of the omnibus that include diminished seventh chords. See Aldwell, Schachter, and Cadwallader (2011, 631), Gauldin 2004c, and Telesco 1998.

recalling the omnibus chromatic bass line in Example 1. To illustrate, Example 15 provides a passage from Beethoven's Piano Sonata, Op. 27, no. 2 (Trio).[28]

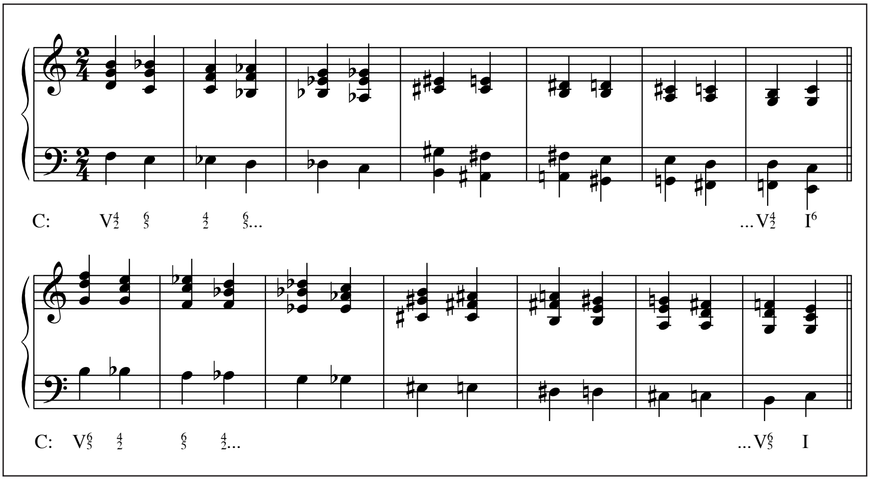


Example 15. Beethoven, Piano Sonata, Op. 27, No. 2 (Trio).

The excerpt opens the B section of the Trio. Beginning in the first full measure, the right hand presents the chordal roots of the sequence: B♭-E♭-A♭-D♭. The parallel tritones in the left hand recall those in the Example 7 root-position backcycle progression, as do the descending fifth/ascending fourth leaps in the right hand. In fact, by switching the hands of the Example 7 progression and changing the contour of the bass line from "down-up-down-up" to "up-down-up-down," the Beethoven passage results (to within key transposition). The closing G♭$^{6}_{3}$ chord acts as IV^6 in the overall tonic of D♭, and leads directly to an IAC in that key.

Example 16 presents two model progressions for backcycling with a chromatic bass line.

[28] Laitz (2012a, 364) discusses the passage in Example 15. Additional examples of the backcycle progression with chromatic bass line appear in Roig-Francolí (2011, 433) and Aldwell, Schachter, and Cadwallader (2011, 484).



Example 16. Backcycling with chromatic bassline.

The first progression begins on V^4_2 in C, chromatically descends a complete octave by the downbeat of the final measure, and resolves to I^6. The outer voices move in parallel tritones, forming the linear intervallic pattern +4, °5. The second progression begins on V^6_5 in C and works similarly, resolving to a root-position I chord. Here, the outer voices form the pattern °5, +4.

The chordal inversions and opportunities for enharmonic reinterpretation in Example 16 open up new possibilities for resolving a given chord in the backcycle progression. To organize these options, Example 17 provides a table arranged by tritone network.

N.B.: If the resolution to I is abrupt, append a V-I or IV-V-I cadence.

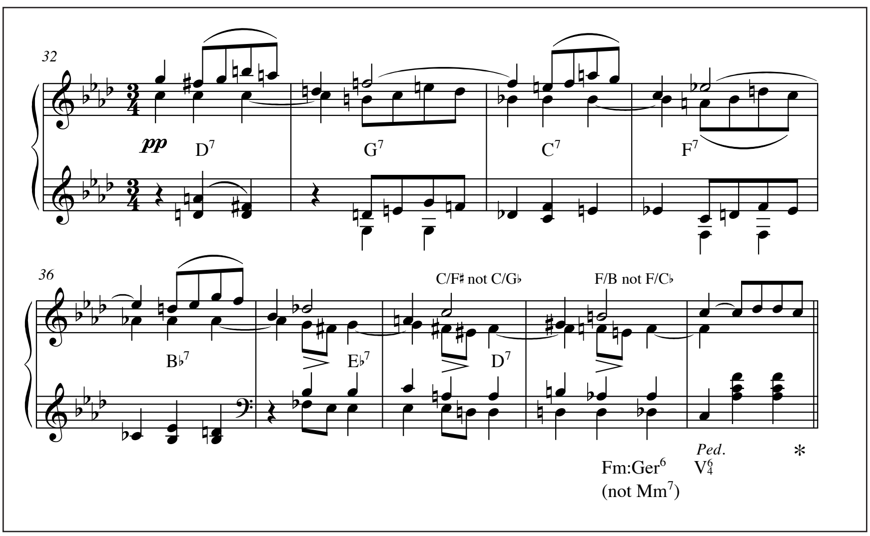
Tritone Scale Degrees	Scale Degree In Bass	Progression	Comment
Tritone Network 1 (Example 5)			
$\hat{4}, \hat{7}$	$\hat{5}$	V^7 - I	Cf. Examples 6 and 10
$\hat{4}, \hat{7}$	$\hat{7}$	V^6_5 - I	Cf. Example 16
$\hat{4}, \hat{7}$	$\hat{4}$	V^4_2 - I^6	Cf. Example 16
$\uparrow\hat{4}, \hat{1}$	$\downarrow\hat{6}$	Ger^6 - V^{6-5}_{4-3} - I	Cf. Examples 6 and 10
$\uparrow\hat{4}, \hat{1}$	$\downarrow\hat{6}$	It^6 - V - I	Cf. Example 10
$\uparrow\hat{4}, \hat{1}$	$\hat{1}$	CT Ger^6 - I	Enharmonic respelling of V^6_5
$\uparrow\hat{4}, \hat{1}$	$\hat{1}$	CT It^6 - I	Enharmonic respelling of V^6_5
$\uparrow\hat{4}, \hat{1}$	$\uparrow\hat{4}$	Ger^{o3} - V - I	Enharmonic respelling of V^4_2
$\uparrow\hat{4}, \hat{1}$	$\uparrow\hat{4}$	It^{o3} - V - I	Enharmonic respelling of V^4_2
Tritone Network 2 (Example 11)			
$\hat{4}, \hat{7}$ or $\downarrow\hat{2}, \hat{5}$	$\hat{5}$	V^{o7} - I	Cf. Example 12
$\hat{4}, \hat{7}$ or $\downarrow\hat{2}, \hat{5}$	$\downarrow\hat{2}$	V^{o4}_3 - I	Enharmonic respelling of V^{o7}
$\hat{4}, \hat{7}$ or $\downarrow\hat{2}, \hat{5}$	$\hat{7}$	V^{o6}_5 - I	Cf. Example 12
$\hat{4}, \hat{7}$ or $\downarrow\hat{2}, \hat{5}$	$\hat{4}$	V^{o4}_2 - I^6	Enharmonic respelling of V^{o6}_5
$\uparrow\hat{4}, \hat{1}$ or $\downarrow\hat{6}, \hat{2}$	$\downarrow\hat{6}$	Fr^6 - V - I	Enharmonic respelling of V^{o7}
$\uparrow\hat{4}, \hat{1}$ or $\downarrow\hat{6}, \hat{2}$	$\hat{2}$	Fr with $\hat{2}$ in bass - V - I	Enharmonic respelling of V^{o4}_3; root-position equivalent of Fr ; predominant function as V^{o7}/V. (Aldwell, Schachter, and Cadwallader 2011, 579)
$\uparrow\hat{4}, \hat{1}$ or $\downarrow\hat{6}, \hat{2}$	$\hat{1}$	CT Fr^6 - I	Enharmonic respelling of V^{o6}_5
$\uparrow\hat{4}, \hat{1}$ or $\downarrow\hat{6}, \hat{2}$	$\uparrow\hat{4}$	Fr^{o3} - V - I	Enharmonic respelling of V^{o4}_2
Tritone Network 3 (Example 13)			
$\hat{4}, \hat{7}$ or $\hat{2}, \downarrow\hat{6}$	$\hat{7}$	vii^{o7} - I	Cf. Example 14
$\hat{4}, \hat{7}$ or $\hat{2}, \downarrow\hat{6}$	$\hat{2}$	vii^{o6}_5 - I^6	Cf. Example 14
$\hat{4}, \hat{7}$ or $\hat{2}, \downarrow\hat{6}$	$\hat{4}$	vii^{o4}_3 - I^6	Cf. Example 14
$\hat{4}, \hat{7}$ or $\hat{2}, \downarrow\hat{6}$	$\downarrow\hat{6}$	vii^{o4}_2 - V^{6-5}_{4-3} - I	Cf. Example 14

Example 17. Resolving any chord in any tritone network.

The leftmost column lists the tritone scale degrees under discussion. The next column indicates the scale degree in the bass. A sample harmonic progression then follows. The rightmost column lists the examples that illustrate the progression and provides commentary on select progressions. Specifically, in tritone network 1, V^{6}_{5} may be enharmonically reinterpreted as a common-tone (CT) Ger^{6} with $\hat{1}$ in the bass. Likewise, V^{4}_{2} may be enharmonically reinterpreted as a Ger$^{\circ 3}$ chord with $\uparrow\hat{4}$ in the bass. Omitting $\downarrow\hat{3}$ from CT Ger^{6} creates CT It^{6}, and omitting $\downarrow\hat{3}$ from Ger$^{\circ 3}$ creates It$^{\circ 3}$. In tritone network 2, $\mathrm{V}^{\circ 7}$ may be reinterpreted as $\mathrm{V}^{\circ 4}_{3}$ or Fr^{6}; $\mathrm{V}^{\circ 6}_{5}$ may be enharmonically reinterpreted as $\mathrm{V}^{\circ 4}_{2}$ or CT Fr^{6} with $\hat{1}$ in the bass; $\mathrm{V}^{\circ 4}_{3}$ may be reinterpreted as Fr^{6} with $\hat{2}$ in the bass; and $\mathrm{V}^{\circ 4}_{2}$ may be reinterpreted as Fr$^{\circ 3}$. In all cases, a V-I or IV-V-I cadence may be appended to the listed progression if an immediate resolution to I sounds abrupt.

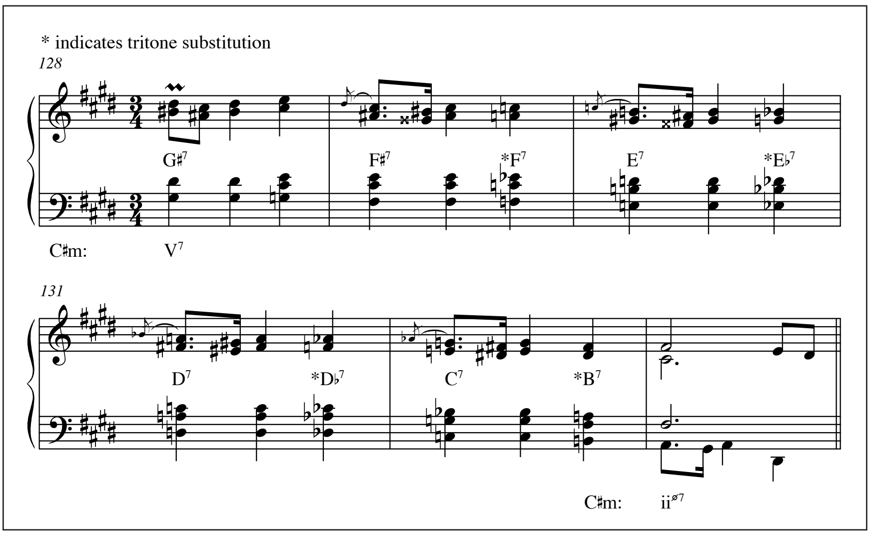
Two Summary Examples

Two passages from Chopin Mazurkas will serve to summarize two important features of the backcycle progression: enharmonic transformation between major-minor seventh and augmented sixth sonorities, and tritone substitution. Examples 18 and 19 reproduce the passages.



Example 18. Chopin, Mazurka 49 in F minor, Op. posth. 68, No. 4.

Example 18 presents an eight-measure phrase that alternates between strong and weak measures; the closing cadential $^6_4$ chord prompts a reprise of the opening material in F minor, the key of the entire work. Annotations on the example indicate a portion of the backcycle progression projecting the roots D-G-C-F-B♭-E♭. The sequence breaks in m. 38, where D^7 appears in place of A♭^{7}; the chordal tritone C/F♯ thus replace C/G♭. This tritone substitution permits a stepwise chromatic bass descent from E♭ to C (mm. 37-40). The descent prepares the return of the tonic key by projecting $\downarrow\hat{7}$ - $\uparrow\hat{6}$ - $\downarrow\hat{6}$ - $\hat{5}$ in F minor. During the descent, a second enharmonic transformation takes place in which D♭ supports Ger^6 instead of V^7; the chordal tritone F/B♮ thus replaces F/C♭. The Ger^6 also creates momentum toward F minor, which the subsequent cadential $^6_4$ intensifies. An intricate and beautiful series of suspensions and half-diminished seventh chords breaks up the parallel motion from D^7 to B♭^{7}, and from E♭^{7} to D^7 to the Ger^6.[29]



Example 19. Chopin, Mazurka 21 in C♯ minor, Op. 30, No. 4.

Example 19 presents the second passage. In terms of phrase rhythm, m. 128 is hypermetrically weak; m. 130 begins a four-bar

[29] While half-diminished seventh chords contain a tritone, they do not typically undergo enharmonic transformations in common-practice music. For this reason, I do not address them in this paper. Cohn (2012, 160-61) and Tymoczko (2011, 284-87) study the interaction of major-minor and half-diminished seventh chords in the Example 18 excerpt.

unit that alternates between strong and weak beats, and m. 133 is hypermetrically strong. Harmonically, the excerpt begins on V^7 in C♯ minor, the tonic of the piece. A chromatic bass line descends from $\hat{5}$ to $\downarrow\hat{7}$. Starting on $\hat{4}$ (F♯), a descending fifths sequence harmonizes the descent, with every other chord replaced by its tritone substitute. On the example, asterisks indicate the tritone substitutions. The resulting parallel voice leading is striking and ceases upon completion of the sequence, where the appearance of $ii^{ø7}$ in the tonic key signals a return to functional harmony and prepares the conclusion of the piece.

The Backcycle Progression As Bridge to an Undergraduate Post-Tonal Theory Course

Like the omnibus progression, the backcycle progression exhibits properties that are covered in several undergraduate textbooks on post-tonal theory. As such, the backcycle progression may act as a bridge from the final semester of tonal harmony to a course on post-tonal theory. In what follows, I outline specific features of the backcycle progression that lay the groundwork for the study of post-tonal music.

The importance of presenting post-tonal theory as an extension of tonal theory, rather than something completely new, cannot be overstated. This stance finds support in Michael R. Rogers's book *Teaching Approaches in Music Theory*, where Rogers writes, "Good theory teaching—not just in harmony, but in all phases—constantly pursues opportunities for presenting one topic as an offshoot, variant, or relative of another."[30] Ken Bain voices similar sentiments in his book *What the Best College Teachers Do*: "When we encounter new material, we try to comprehend it in terms of something we think we already know. We use our existing mental models to shape the sensory inputs we receive…[W]e all use existing constructions to understand any new sensory input."[31]

The first such topic is pitch-class integers (mod 12).[32] Please refer back to the keyboard diagrams in Examples 3-4. As stated earlier, the

[30] Rogers (2004, 57).

[31] Bain (2004, 26-27).

[32] Clendinning and Marvin (2011, 706-8), Henry and Rogers (2005, 461-62), Kostka, Payne, and Almén (2013, 495), Pearsall (2012, 43-46), Roig-Francolí (2008, 70), Straus (2005, 4-5), Williams (1997, 31).

purpose of such diagrams is to lead students toward a conception of note names that encourages enharmonically-equivalent spellings of each note. The descriptor "tritone" accomplishes this task, as do scale degree numbers. It requires only a modest conceptual leap to rename the individual piano keys with pitch-class integers. Each C or B♯, regardless of octave, will be named zero; each C♯ or D♭, regardless of octave, will be named one; and so forth, ending with each B or C♭, which will be named eleven. In the context of post-tonal theory, where (broadly speaking) enharmonic equivalence holds, students now have a way to name notes that does not involve scale degrees or the tonal implications of, say, B versus C♭. In the context of the backcycle progression, where (broadly speaking), enharmonic equivalence does *not* hold, students now have neutral descriptors for tritones, such as "zero, six," or Mm^{7}/Ger^{6} chords, such as "zero, four, seven, ten" that may be translated into scale degrees in specific keys.

Sensitized to the benefits of having a single numerical name for each note on the keyboard, students are well positioned to reconceive of intervals, and to begin the study of interval cycles, another set of topics common to undergraduate post-tonal textbooks.[33] The instructor may begin by pointing out the slight discrepancy that arises when one describes the omnibus as an "equal division of the octave by minor thirds" or the backcycle progression as an "equal division of the octave by perfect fifths." The discrepancy, of course, is that it is impossible to equally divide the octave by any interval without enharmonic respelling.[34] As such, the omnibus progression in Example 1 substitutes an augmented second for a minor third on the downbeats of mm. 3 and 4 (from C♯ to B♭), and the backcycle progression in Example 7 substitutes a diminished sixth for a perfect fifth in m. 4 (from D♭ to F♯). From the tactile perspective of the pianist, however, the bass note on each downbeat of Example 1 is "three keys away" (counting white and black keys). Likewise, in Example 7, adjacent bass notes *within* measures are "seven keys away," while

[33] Intervals are covered in Clendinning and Marvin (2011, 720-24), Henry and Rogers (2005, 456-60), Kostka (2006, 186), Pearsall (2012, 50-56), Roig-Francolí (2008, 71-73), Straus (2005, 6-12), and Williams (1997, 35-44). Interval cycles are covered in Pearsall (2012, 57), Roig-Francolí (2008, 37-41), Straus (2005, 154-57), and Williams (1997, 200-203).

[34] Aldwell, Schachter, and Cadwallader (2011, 631-33), Cohn (2012, 9, 11), Gauldin (2004a, 737), Laitz (2012a, 648-53), Roig-Francolí (2011, 724-25).

the pairs of bass notes on beat two in one measure and beat one in the following measure are "five keys away." From this perspective, one may rename the omnibus progression as an "interval three cycle" and the backcycle progression as an "interval seven or interval five cycle." The concept may be further developed upon noticing that each voice in the omnibus progression moves by "interval one," as do the upper voices of the backcycle progression in Example 7. The identification and naming of the remaining interval two, four, and six cycles is then straightforward; students will recognize these cycles by their familiar names: "whole-tone scale," "augmented triad," and "tritone."

To illustrate all possible interval cycles using the backcycle progression, the student should direct attention to pairs of chords at increasing temporal distances. In Example 7, adjacent chords form an interval 5/7 cycle, since the root of each chord is a perfect fifth below (or perfect fourth above) the immediately preceding chord. Similarly, chords that occur two beats apart form an interval 2/10 cycle, since the root of each chord is a major second below (or minor seventh above) the immediately preceding chord. In like fashion, chords that occur three beats apart form an interval 3/9 cycle; chords that occur four beats apart form an interval 4/8 cycle; chords that occur five beats apart form an interval 1/11 cycle; and chords that occur six beats apart form interval 6 cycles. To play these cycles, the student may silently depress the piano keys on the chords that lie outside the cycle.

A final feature of the backcycle progression that looks ahead to post-tonal theory stems from the fact that dominant seventh and diminished seventh chords share three tones, with the remaining tones separated by one semitone. For example, CMm^7 and $\text{C}\sharp^{\circ 7}$ share the common tones {E, G, B♭}, while the remaining tones C and C♯ lie a semitone apart. Several undergraduate tonal theory textbooks stress this point, noting the similar behavior of V^7 and $\text{vii}^{\circ 7}$ (and their inversions), as well as the opportunities for modulations to distant keys that arise through this relation.[35] In the context of the backcycle progression, a semitonal alteration of V^7 to $\text{vii}^{\circ 7}$ grants access to additional resolutions upon exiting the sequence, as illustrated by Example 14 in connection with tritone network 3. The Brahms passage in Example 20 illustrates this semitonal relation as well.

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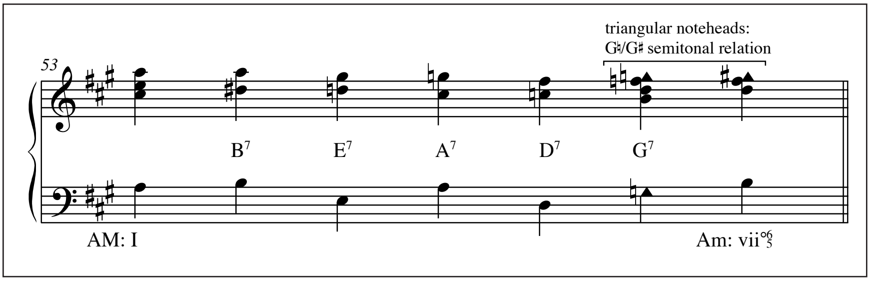
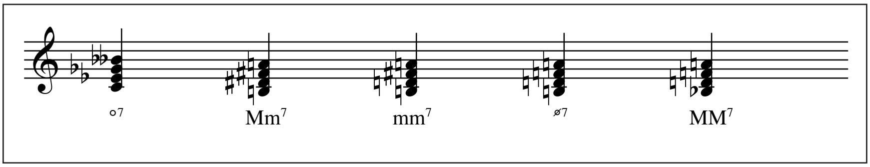
[35] Gauldin (2004a, 726), Laitz (2012a, 172), Roig-Francolí (2011, 359). See also Cohn (2012, 150-55).



Example 20. Brahms, Symphony 3, I.

The excerpt begins in A major and ends on $vii^{\circ 6}_{5}$ in A minor, the closing key of the exposition in this sonata form movement. The passage backcycles through B-E-A-D-G♮, with each root harmonized as a Mm^7 chord. The concluding GMm^7 and $G\sharp^{\circ 7}$ chords share three common tones (B, D, F♮) and the remaining tones lie one semitone apart (G♮, G♯). On the example, triangular noteheads indicate the semitonal relation. In sum, rather than continuing to backcycle past B-E-A-D-G♮, Brahms exploits the semitonal relation shared by GMm^7 and $G\sharp^{\circ 7}$ to cadence in A minor more quickly.

Example 21 illustrates how the semitonal relation between Mm^7 and $^{\circ 7}$ chords extends to the other three types of seventh chords in tonal music as well.[36]



Example 21. Semitonal relations among seventh chords.

Each adjacent pair of chords shares three common tones, while the remaining tones lie one semitone apart. Other orderings of the five types of seventh chords will create similar progressions, such as CMM^7 - CMm^7 - Cmm^7 - $C^{ø7}$ - $C^{\circ 7}$, or Cmm^7 - $C^{ø7}$ - BMM^7 - BMm^7 - $C^{\circ 7}$.

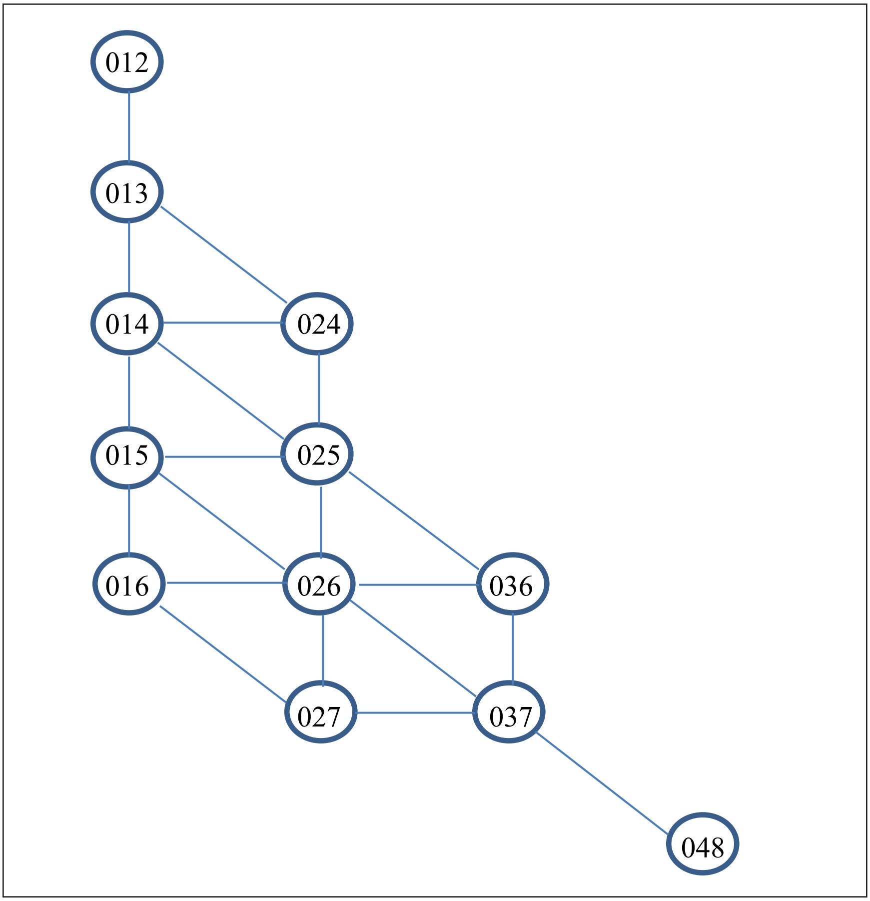
[36] Semitonal relations among four-note set classes are studied in Cohn 2003, Cohn (2012, 149-68), Straus (2003, 337-40), and Tymoczko (2011, 93-106).

Generalizations of this property underlie three topics covered in undergraduate textbooks on post-tonal theory. The first topic is parsimonious voice leading among major and minor triads, covered in texts by Roig-Francolí, Pearsall, and Straus.[37] The voice leading between two triads is parsimonious if they share two common tones and the remaining tones lie one (or two) semitones apart. Parsimonious voice leading, and the triadic transformations associated with it, provides a way to analyze music that uses major and minor triads outside the context of functional harmony. The second topic is atonal pitch space, covered in Straus's *Introduction to Post-Tonal Theory*.[38] Straus introduces this topic with the "voice-leading space for trichords" reproduced in Example 22.[39]

[37] Roig-Francolí (2011, 729-37), Pearsall (2011, 10-12), Straus (2005, 158-66). A relevant non-textbook source is Engebretson and Broman 2007.

[38] Straus (2005, 110-12).

[39] Straus (2005, 111). Reproduced with permission of author. Straus includes Forte numbers for each trichord, which I have omitted. Similar diagrams appear in Straus (2003, 337) and Tymoczko (2011, 85-92).



Example 22. Reproduction of Straus, "Voice-leading space for trichords."

The diagram displays the twelve trichordal set classes. Lines connect trichords that share two common tones and whose remaining tones lie one semitone apart. For example, 012 and 013 share two common tones (0 and 1), while the remaining tones differ by one semitone (2 and 3). In essence, the diagram extends the principle of parsimonious voice leading among major and minor triads to *all* three-note set classes.

Straus's presentation of "transformational voice leading" in *Introduction to Post-Tonal Theory* extends the principle yet further. In the parlance of transformational voice leading, the semitonal relation between $C^{\circ 7}$ and BMm^7 is a "fuzzy-T_0 relation with an offset of one semitone."[40] "Fuzzy-T_0 relation" indicates that $C^{\circ 7}$ and BMm^7 *almost* relate by T_0 – they share three common tones out of a possible four.

[40] Straus (2005, 108-9).

The "offset" number indicates the distance from an exact T_0 relation, as measured in semitones. Straus employs this methodology in the analysis of non-tonal excerpts from compositions by Webern and Sessions. In that setting, the approach is not limited to four-note sets such as seventh chords, and the offset number need not be one. However, the lower the offset number, the tighter the relation between two sets. Like parsimonious voice leading among triads and atonal pitch space, transformational voice leading places a premium on the coherence provided by common-tone retention and semitonal voice leading.

Conclusion

The backcycle progression equips the student to gain mastery of enharmonic equivalence, enharmonic modulation, and equal divisions of the octave at the keyboard. By seizing on a seldom-discussed aspect of the enharmonic equivalence between V^7 and Ger^6 involving the spelling of the chord's tritone, the progression deepens the student's understanding and command of enharmonic transformation. Tritone networks organize the myriad possibilities for transformation in a gradual, methodical framework. The progression and its associated networks thus synthesize several important topics in the undergraduate study of chromatic harmony. In addition, the backcycle progression grants analytic access to rich and challenging repertoire by Chopin and Brahms, forges connections with the study of jazz harmony via tritone substitution, and lays the groundwork for the study of post-tonal theory. An important avenue for future research is the pedagogical treatment of additional keyboard progressions that actively engage the student in the process of resolving a given chord through both cognitive and tactile modalities.

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