

Rock Logic

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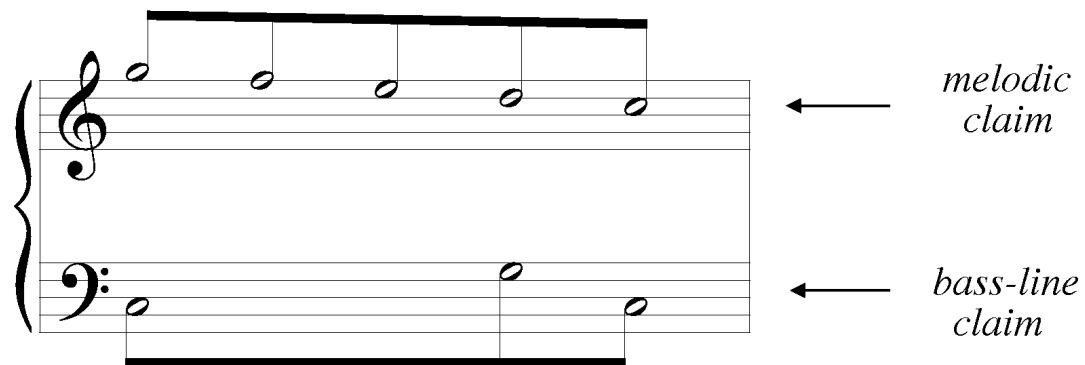
Melodies

- Heinrich Schenker made two true and useful claims about classical phrase structure:
 - Melodies typically ascend by leap and descend stepwise, often between notes of the tonic triad. (This motion is often decorated or embellished.)
 - Bass lines tend to outline an *leaping* motion from tonic to dominant, and back to the tonic.



Melodies

- These two claims are embodied what Schenker called the *Ursatz*.



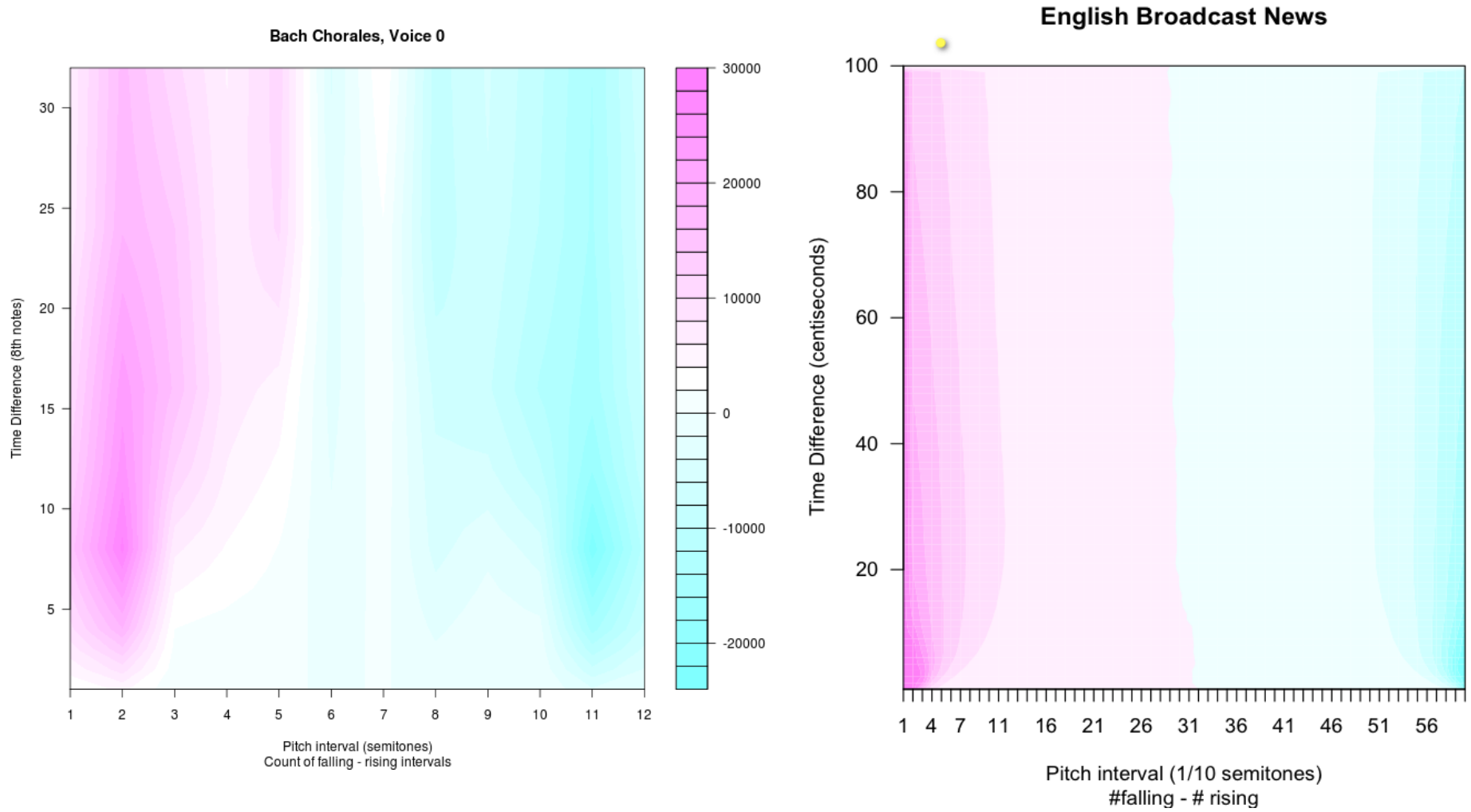
The image shows a musical score with two staves. The top staff is in treble clef and contains a sequence of five quarter notes: G4, A4, B4, C5, and B4. A thick black horizontal bar is drawn above this staff, spanning the entire width of the notes. An arrow points from the text 'melodic claim' to this bar. The bottom staff is in bass clef and contains three notes: G2, B1, and G2. A thick black horizontal bar is drawn below this staff, spanning the entire width of the notes. An arrow points from the text 'bass-line claim' to this bar.



Melodies

- As it turns out, the two claims are very different.
- The melodic claim is quite general:
 - Stepwise descent is a melodic norm across a wide range of different musical cultures, genres, and styles, functionally tonal and not.
 - As well as non-music
 - We can expect a broad range of musics to emphasize notes of the tonic triad, for instance by starting and ending melodic phrases with these notes.
- The claim about bass lines, however, is quite style-specific.
 - I-V-I functionality (contra Schenker) is heavily conventional.
 - There are lots of broadly tonal styles in which the V-I harmonic norm is weak or entirely absent.
 - There is no reason to expect bass lines in these styles to conform to a Schenkerian paradigm.

Evidence I



(Thanks to Mark Liberman.)

“Helpless” (Neil Young)

The image displays a musical score for the first three measures of the song "Helpless" by Neil Young. The score is written in D-flat major (two flats) and 4/4 time. It consists of two staves: a treble clef staff and a bass clef staff. The treble staff begins with a treble clef, a key signature of two flats, and a 4/4 time signature. The first three measures contain the following notes: G4 (quarter), F4 (quarter), E4 (quarter), D4 (half). The bass staff begins with a bass clef, a key signature of two flats, and a 4/4 time signature. The first three measures contain the following notes: G3 (quarter), F3 (quarter), E3 (quarter), D3 (half). Above the treble staff, the figured bass notation is 3̂ 2̂ 1̂. Below the bass staff, the figured bass notation is "D \flat :" I V IV. A speaker icon is located to the right of the score.

Harmonies (DT)

- Intuitively, there is an important difference between progressions like C–G or C–B \flat and progressions like C–F \sharp or C–B.
 - All support stepwise melodic motion, but the first two sound much more “normal” than the second two.
 - This sense of “normalness” has to do with the extent to which they imply *a diatonic scale* (in my terms: *a diatonic macroharmony*).

Measuring Diatonicity

- The C and G major triads, like the C and D major triads, (or C and B \flat , or C and F) have a *diatonic distance* of 0, since there is a single diatonic scale containing both.
- C and A have *diatonic distance* 1, since they are contained in diatonic scales that are adjacent on the circle of fifths (G major and D major). The same is true of C and E \flat , or any other minor-third related triads.
- C and E have *diatonic distance* 2, since they are contained in diatonic scales that are separated by one scale on the circle of fifths (G major and A major). The same is true of C and A \flat , or any other major-third related triads.

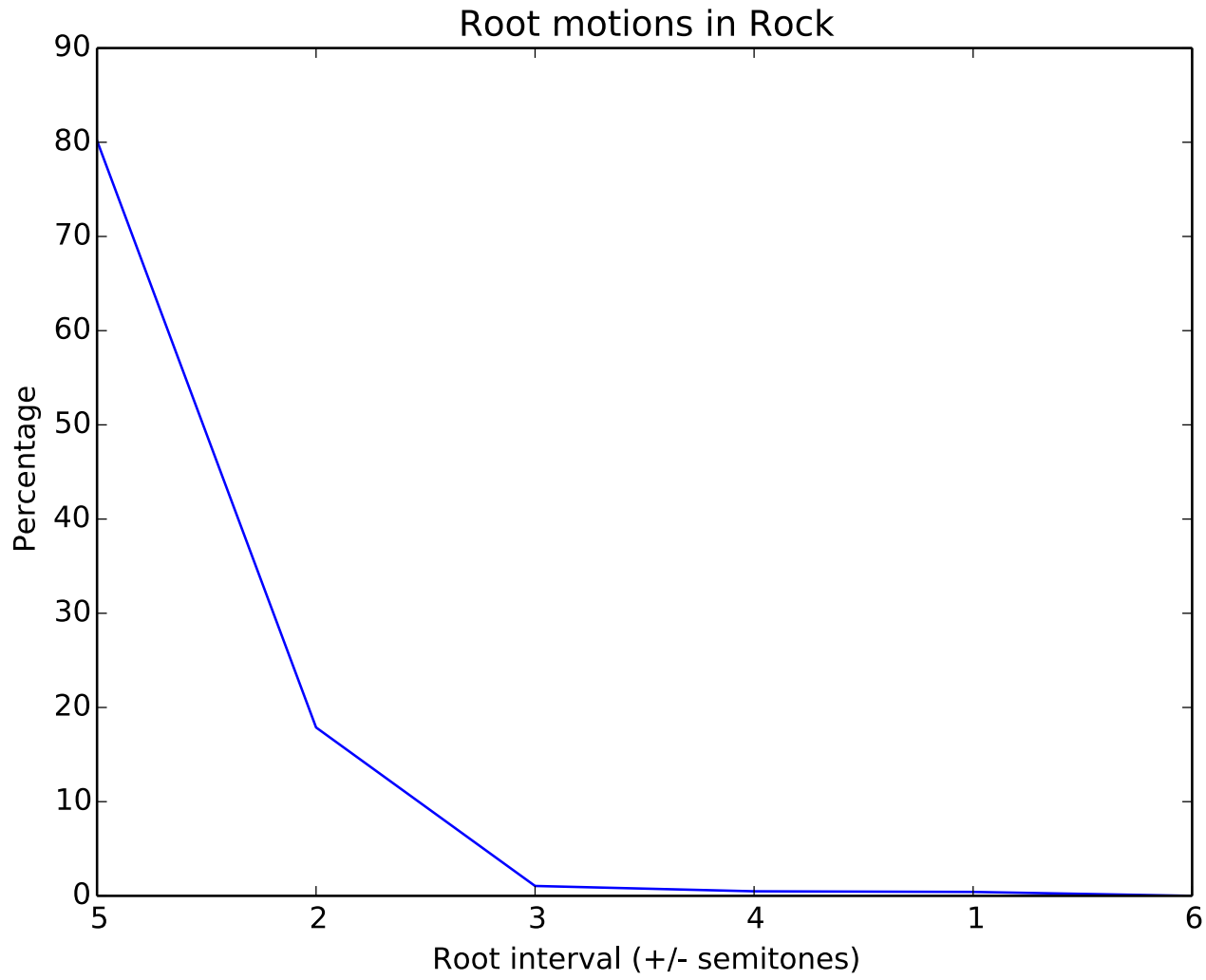
Measuring Diatonicity

- C and B, like any other pair of semitonally adjacent major triads, have diatonic distance of 3. (G major and E major are 3 steps apart on the circle of fifths.)
- C and F \sharp /G \flat have diatonic distance of 4, like every other pair of tritone-related major triads.
- This is just the “circle of fifths” distance among triads
 - NB: “circle of fifths distance” arises because of a background voice leading between *major scales* (GOM, Chapter 4).

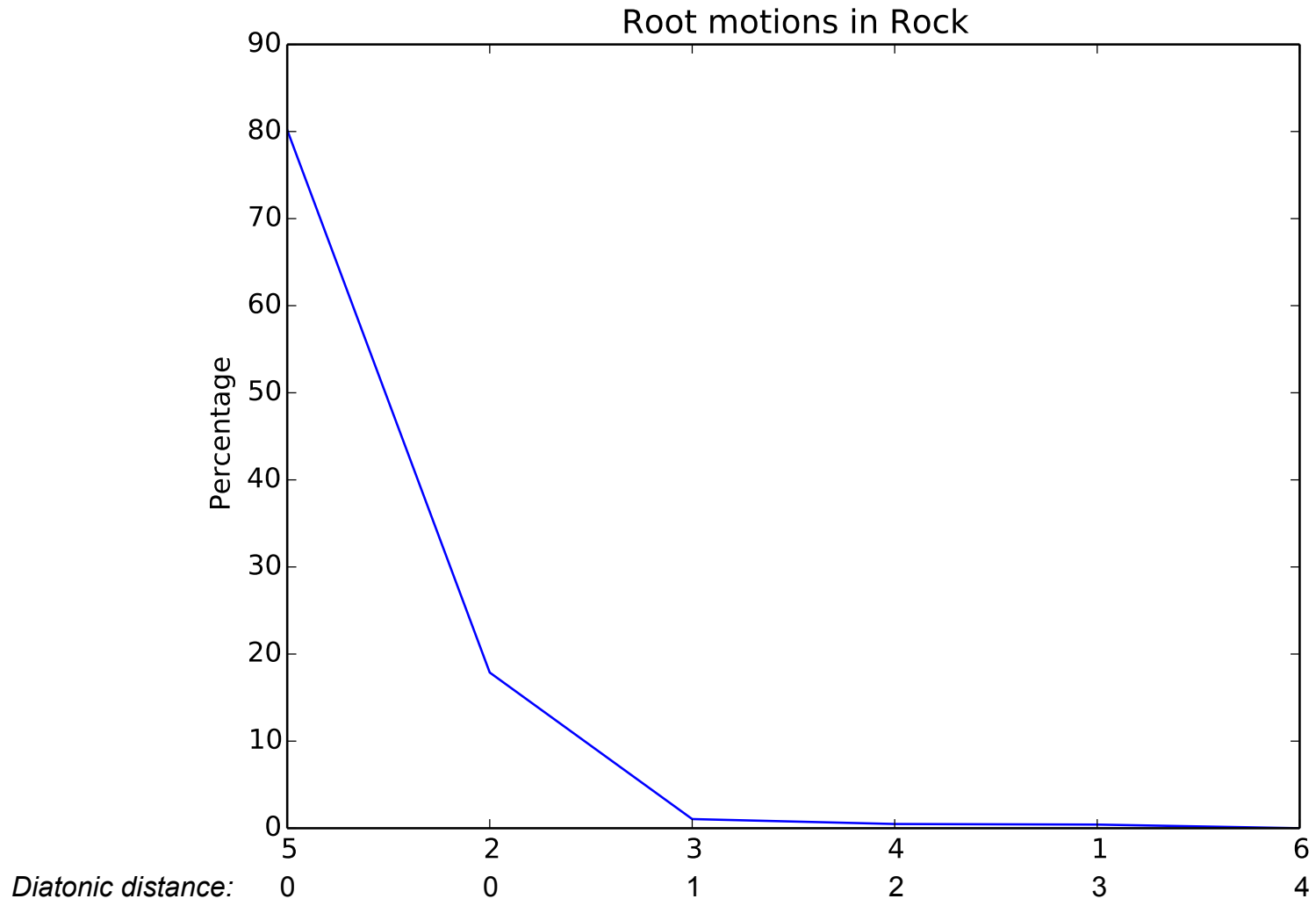
Claim

- Rock musicians will favor progressions that involve low diatonic distances—lots of motion by fifth, major second, and perhaps minor third, and less by major third, minor second, and tritone.
 - This represents an intuitive and untheorized preference for the diatonic scale.

Evidence II



Evidence II



“Heavily Diatonic Chromaticism”

Basic claim: *I’m arguing that rock musicians like the diatonic scale a lot, but not too much. Rock musicians are reasonably happy to depart from the scale, particularly when designing progressions that utilize exclusively major chords (e.g. C-G-B \flat -F or A-C-G-D). However, I am saying that a preference for diatonicity (or “near diatonicity”) still governs these departures from pure diatonicism.*

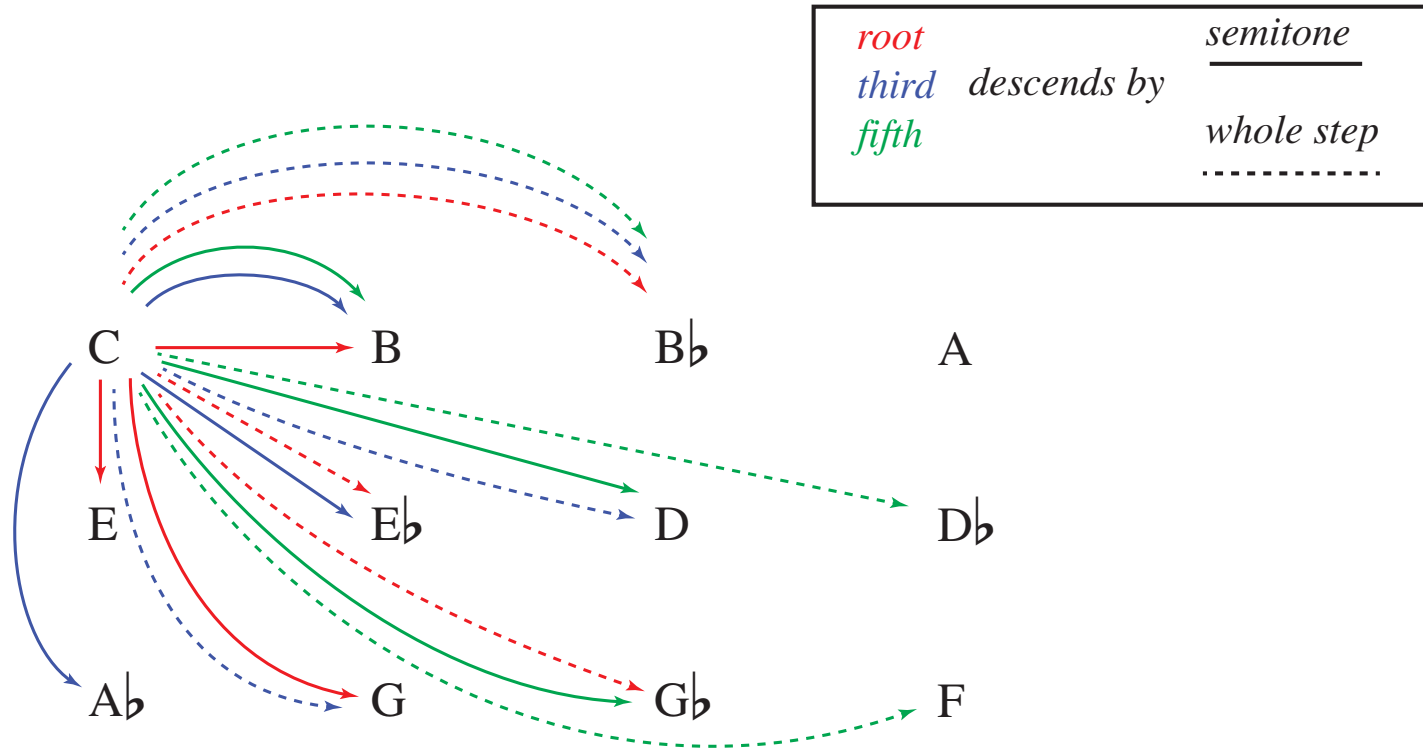
- An entirely new species of “chromaticism”
 - Fundamentally different from more familiar 19th-century varieties
- Later, I’ll draw connections to certain 17th-century repertoires, particularly Schütz’s Psalmen Davids.

So ...

We have two principles ... stepwise melodic descent and small diatonic distance ...

Now what we need is a model.

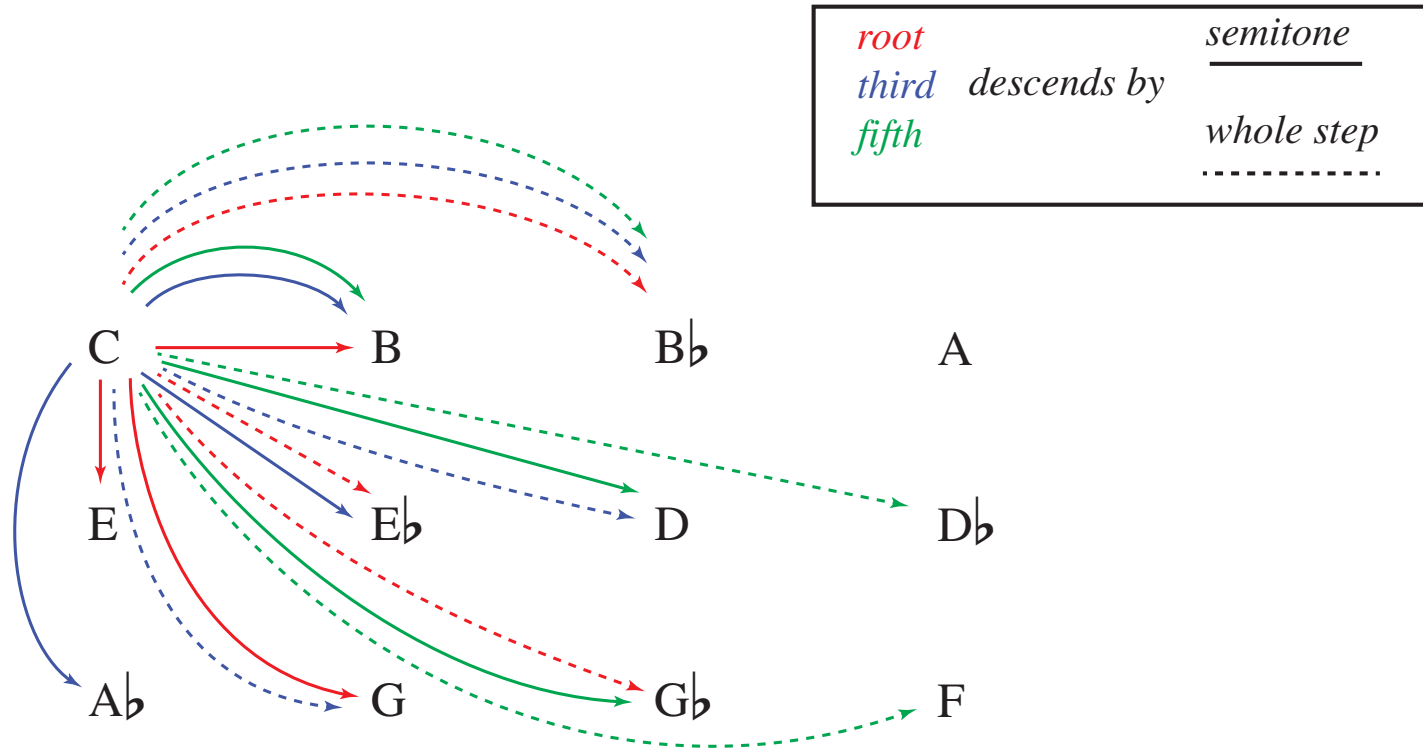
Theorizing Stepwise Descent



*we can list all major-chord progressions
that support a stepwise descending melody*

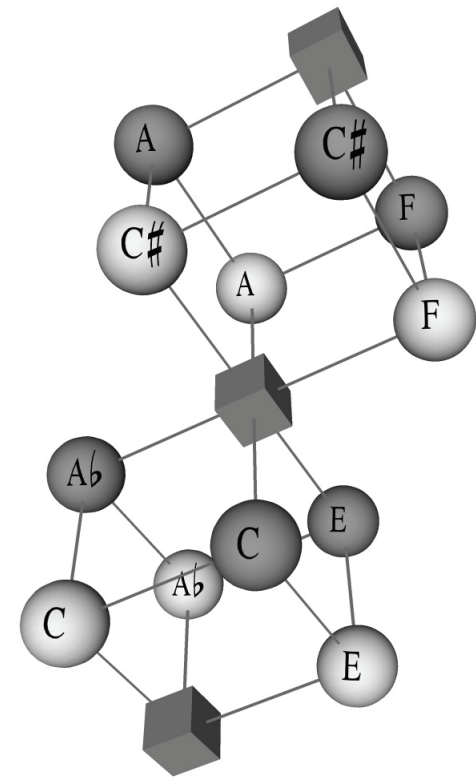
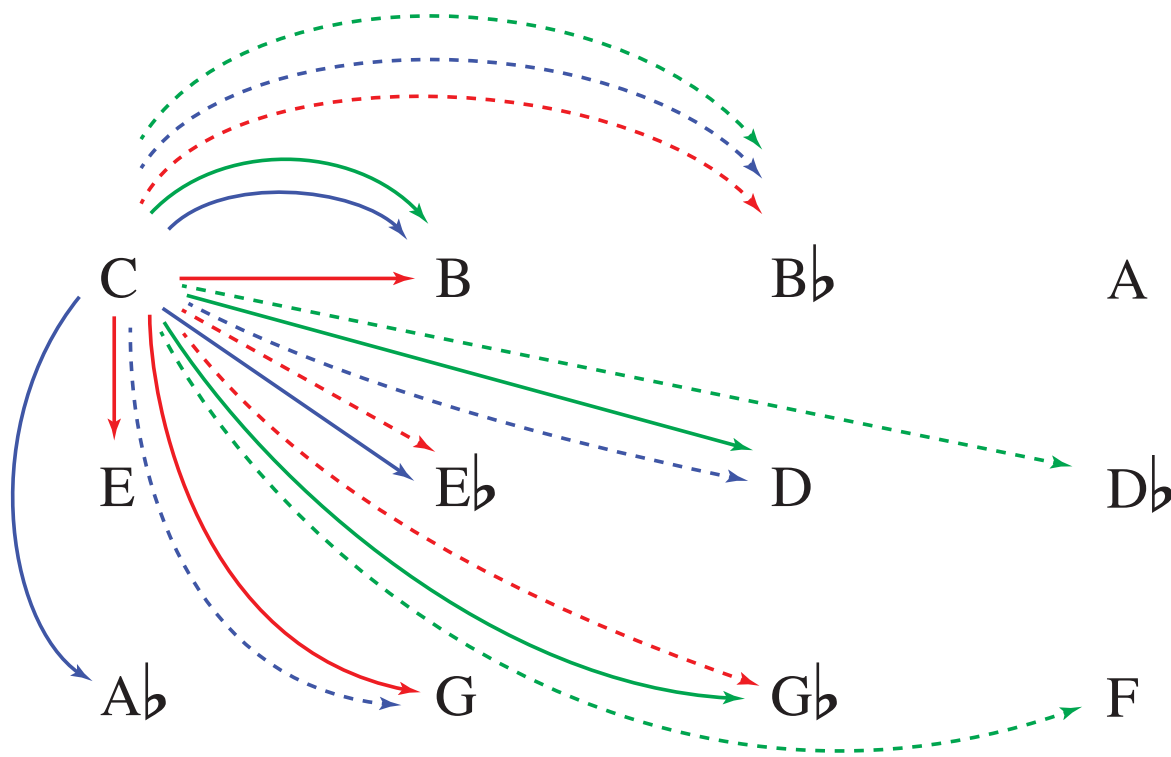
NB: the situation with minor chords is similar ...

Theorizing Stepwise Descent



*we can list all major-chord progressions
that support a stepwise descending melody
... but we won't discuss them today!*

It's Geometry Again!



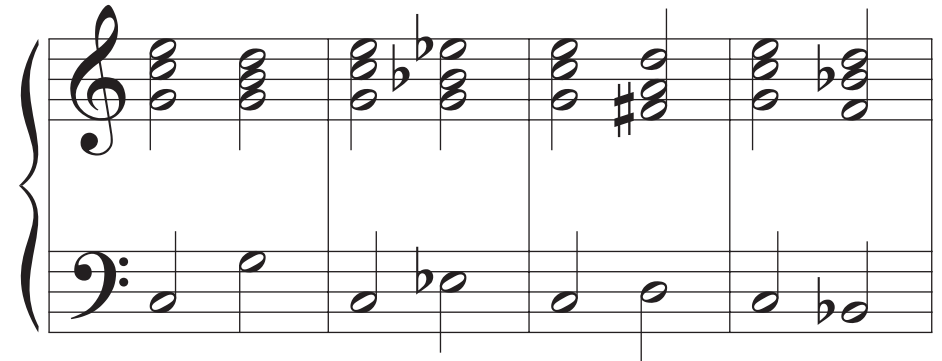
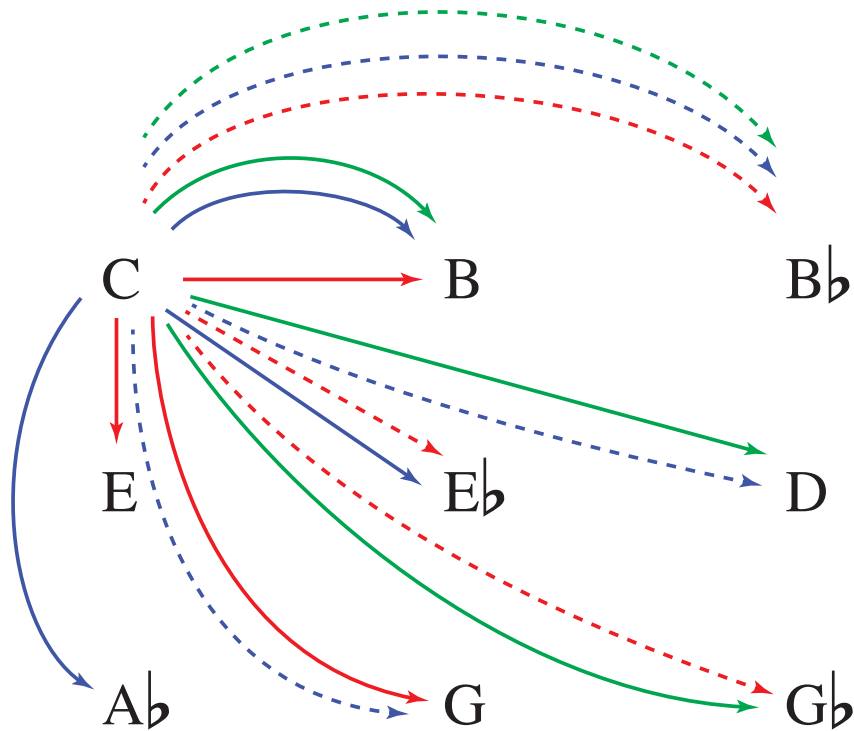
This is just a version of the lattice at the center of three-note chromatic space, sometimes called “Cube Dance” (after Douthett and Steinbach). See GOM, Chapter 3.

Multiple Arrows are Good

The diagram illustrates a C chord as a starting point with multiple arrows pointing to various other chords: B, B \flat , E, E \flat , D, Ab, G, and G \flat . Solid arrows represent direct harmonic relationships, while dashed arrows represent more complex or indirect relationships. The musical notation to the right shows a piano accompaniment for these chords in a four-measure progression, with the treble clef showing chords and the bass clef showing a simple bass line.

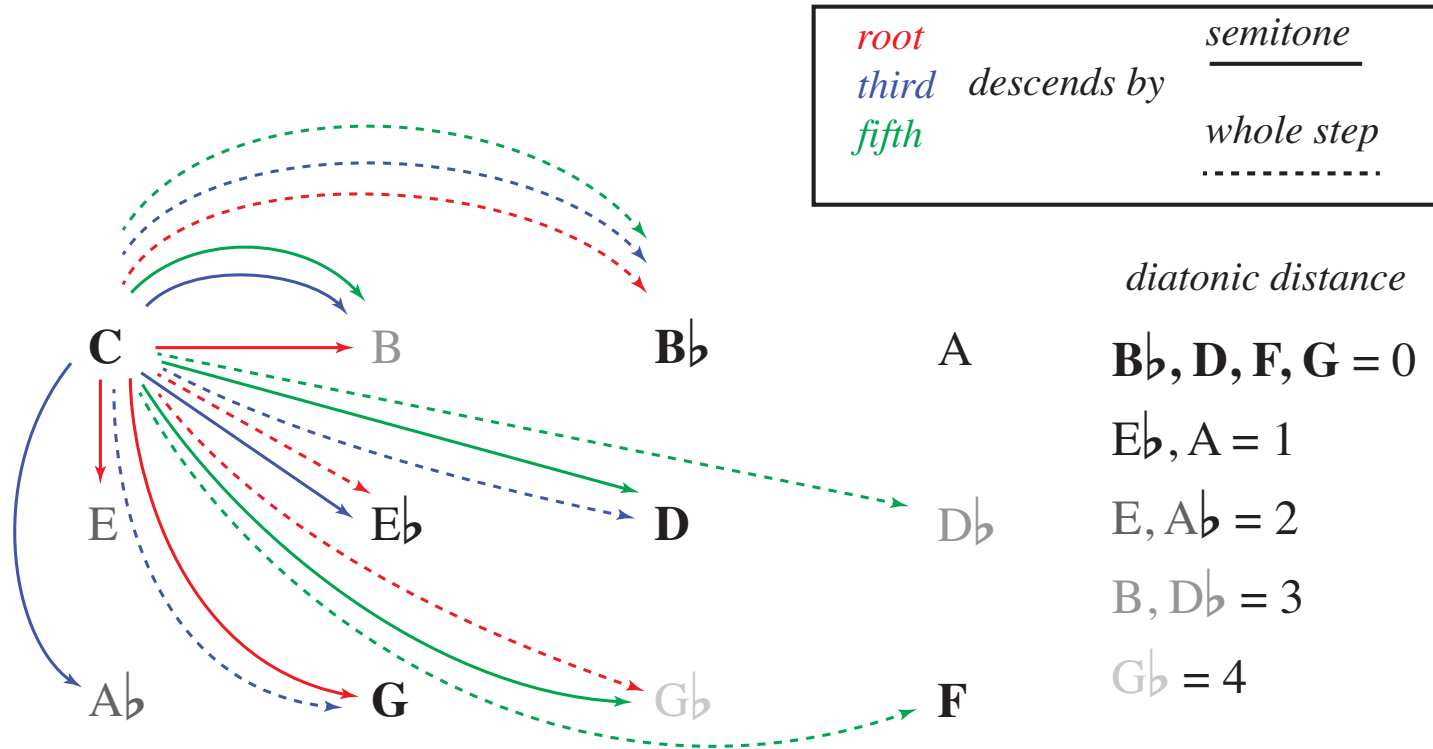
If you use a progression represented by multiple arrows then you have several melodic options (), as well as the possibility of simultaneous stepwise descents in harmony.*

Multiple Arrows are Good



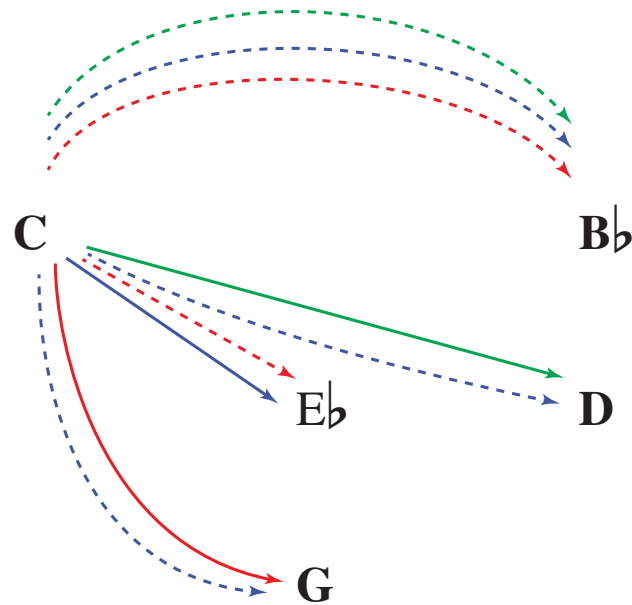
() Randomly harmonizing stepwise descents, one is more likely to choose one of the progressions with multiple arrows.*

Theorizing Rock Harmony



Claim: rock musicians will favor progressions providing multiple opportunities for stepwise descending voice leading (several arrows) and also a low diatonic distance (dark).

Theorizing Rock Harmony

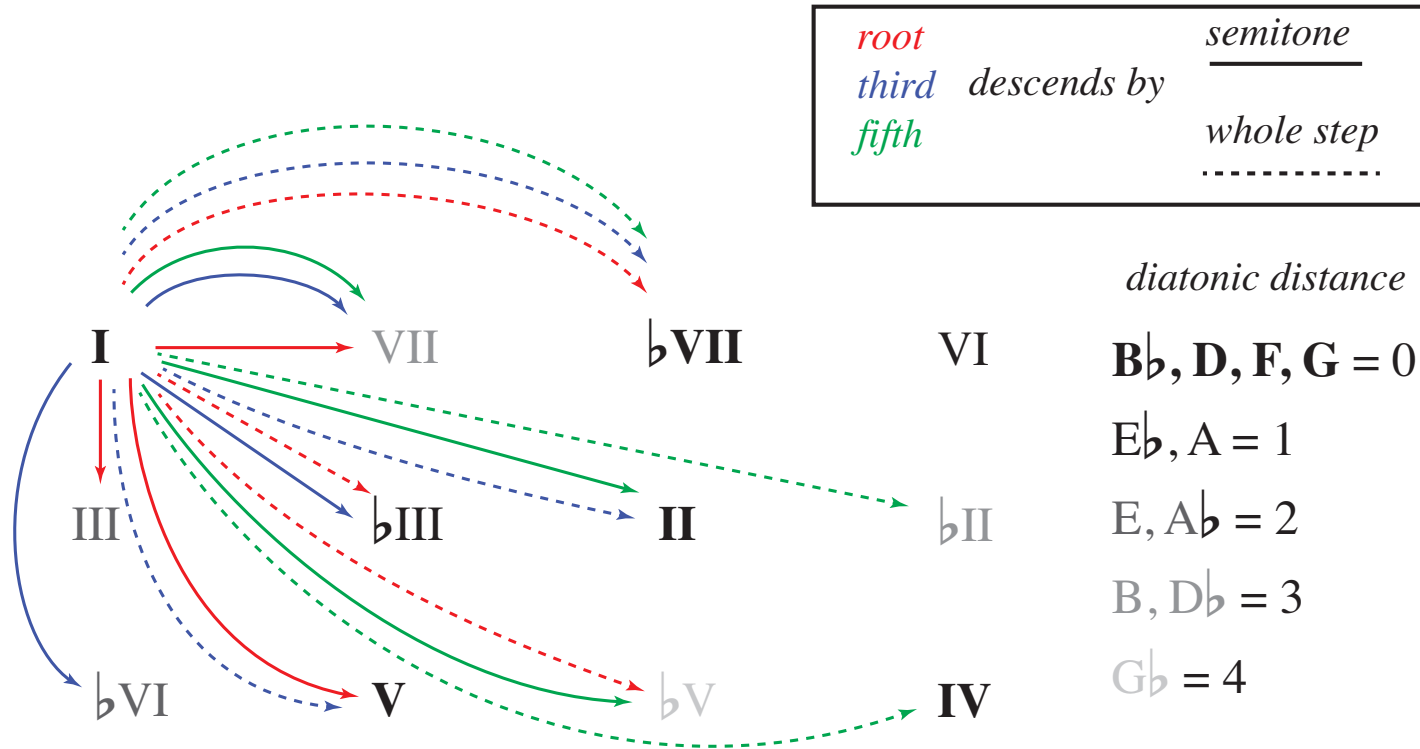


In particular, we should be expecting ascending minor-third, ascending fifth, and either ascending or descending major-second progressions (possibly with some major third motion)

Or to conversely: less semitonal, tritone, or descending minor-third () motion, with descending fifths only in special (functionally tonal?) circumstances.*

() these do appear; but not supporting descending VL.*

Theorizing Rock Harmony



We can use this as a kind of “gameboard” for tracing rock progressions

“Helpless” (Neil Young)

The diagram illustrates the chord progression for the song "Helpless" by Neil Young. It shows a sequence of chords: I, III, \flat VI, A5, VII, \flat III, V, D2, \flat VII, II, \flat V, VI, \flat II, IV, A5, I, III, \flat VI. Arrows indicate the progression: I to V (A5), V to IV (D2), IV to I (A5), and a curved arrow from V to IV. The musical score on the right shows three notes in the bass clef: I, V, IV, with hats above them ($\hat{3}$, $\hat{2}$, $\hat{1}$) and the label "“Db:”" below. The treble clef has corresponding notes.

Note: lots of ascending-fifth and major-second motion. I call this the *retrofunctional norm*, since it emphasizes ascending fifths and IV-I over descending fifths and V-I.

“Eight Days a Week” (The Beatles)

A2 A3 A5

I
VII
bVII
VI
I

III
bIII
II
bII
III

bVI
V
bV
IV
bVI

D: I
II
IV
I



Again, the progression is structured around a “retrofunctional” IV-I cadence, rather than a functional V-I progression. But the stepwise descending melody (connecting tonic-triad notes) is clear.

“F* you” (Cee-Lo Green)

“Rose Parade” (Elliott Smith)

The diagram illustrates the chord progression for the first four measures of "Rose Parade". The chords are: I, A5, VII, A5, bVII, A3, VI, A5, III, bIII, II, bII, III, bVI, V, bV, IV, bVI, I.

The musical score shows the following chords: D: I, V, II, IV. The notes above the staff are: $\hat{3}$, $\hat{2}$, $\hat{1}$.

*I'd say it's a sight that's quite worth seeing
 It's just that everyone's interest is stronger than mine
 And when they clean the street I'll be the only shit that's left behind*



“Rose Parade” (Elliott Smith)

The diagram shows a chord progression in D major. The chords are: I (D), V (A), II (B), and IV (G). The progression is: I → V → II → IV → I. Above the first four chords are the labels A5, A5, A3, and A5. To the right, a musical score shows the first four chords in D major, with figured bass notation below: D: I V II IV. Above the score are the numbers 3, 2, and 1, corresponding to the first three chords.

*"Depression is a prison where you are both the suffering prisoner and the cruel jailer."
~Dorothy Rowe*



Group I: the “Rose Parade” family

I	V	II	IV	(Rose Parade)
I	V		IV	(Helpless)
I		II	IV	(Eight days a week)
/	V	//		??

“Sympathy for the Devil” (Rolling Stones)

D2 A5 A5 $\hat{5}$ $\hat{4}$ $\hat{3}$

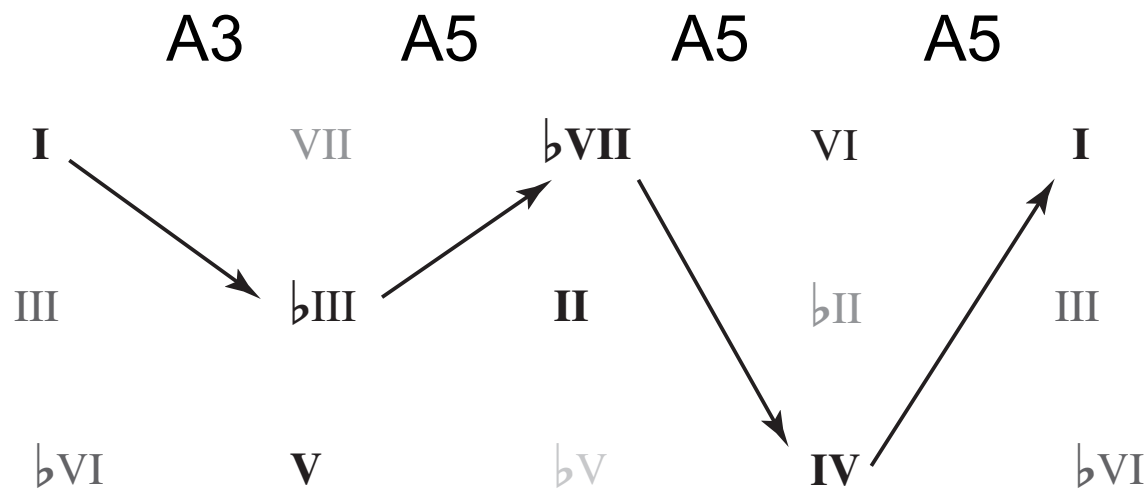
Chord progression diagram showing a sequence of chords: I, VII, bVII, VI, I, III, bIII, II, bII, III, bVI, V, bV, IV, bVI. Arrows indicate a path from I to bVII, bVII to IV, and IV to I.

Musical notation showing a sequence of chords: I, bVII, IV, V, I.

Also: “I Can’t Explain,” “Back in Black,” etc.



“The Air Near My Fingers” (The White Stripes)



Musical notation for the first four chords:

- Chords: I, \flat III, \flat VII, IV
- Labels above: $\flat\hat{3}$, $\hat{2}$, $\hat{1}$

A: I \flat III \flat VII IV



Also: “Mad World” (Tears for Fears)

Group II: the “Mad World” family

I	bIII	bVII	IV	(Mad Word/Air Near ...)
I		bVII	IV	(Sympathy for the Devil)
I	bIII	bVII		(Stairway to Heaven, etc.)
I	bIII		IV	(Born to be Wild, etc.)

Group III: the “Natural Woman” family

I	V	bVII	IV	(Rio/Natural Woman)
I	V		IV	(Helpless, etc.)
I		bVII	IV	(Sympathy for the Devil, etc.)
I	V	bVII		(Sweet Child O’ Mine, etc.)

To do: make graphs of Rio, etc.

“Hey Joe” (Roberts/Hendrix)

The diagram illustrates the chord progression for the first four measures of the song. The chords are arranged in a grid with Roman numerals and accidentals. Arrows indicate the voice leading between measures.

	A5	A5	A5	A5
I	VII	\flat VII	VI	I
III	\flat III	II	\flat II	III
\flat VI	V	\flat V	IV	\flat VI

Arrows show the following voice leading: \flat VI to \flat III, \flat III to VII, VII to \flat VII, \flat VII to VI, VI to I, I to \flat III, \flat III to \flat VI, \flat VI to V, V to \flat V, \flat V to IV, IV to \flat II, \flat II to \flat VI, and \flat VI to I.

The musical notation shows the first four measures of the piece. The treble clef staff contains chords with hats above them: $\hat{8}$, $\hat{7}$, $\hat{6}$, and $\hat{5}$. The lyrics "I'm going down to shoot my old lady ..." are written below the treble staff. The bass clef staff shows the bass line.

E: \flat VI \flat III \flat VII IV I

does this create the feeling of sinking down?

“Time Warp” (Rocky Horror), “A Day in the Life” (Beatles)
 “Here Comes the Sun” (Beatles)



Conclusion

- A fair amount of (seemingly idiosyncratic) rock harmony can be explained by the desire to support stepwise descending melodies using progressions with a low diatonic distance.
- Because of the geometry of musical space, and a desire to create mostly diatonic progressions, the music tends to exploit root motion by ascending fifth, ascending minor third, a ascending and descending major second.
- This produces tonic-returning, quasi-cadential progressions featuring IV-I (or maybe \flat VI-I or \flat VII-I) rather than V-I.
 - Hence the term “retrofunctional.” The music emphasizes *plagal* over *dominant/tonic* relationships.
- We can use our graph to group otherwise unrelated tunes into families

PART II

Shepard-tone Passacaglias

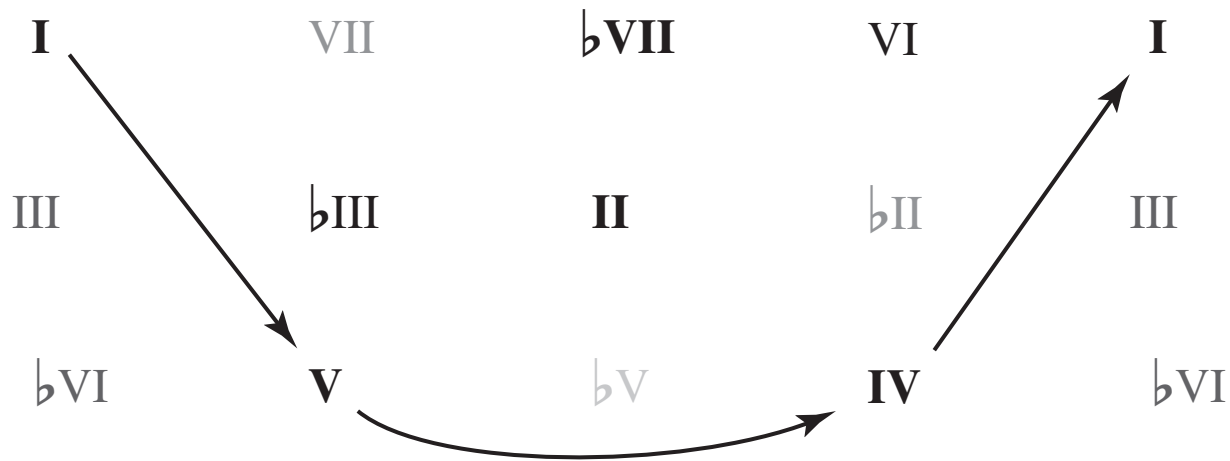
Shepard-tone Passacaglias

I	VII	\flat VII	VI	I
III	\flat III	II	\flat II	III
\flat VI	V	\flat V	IV	\flat VI

Suppose we have a three- or four-chord repeating pattern, moving rightward by short distances at each step.

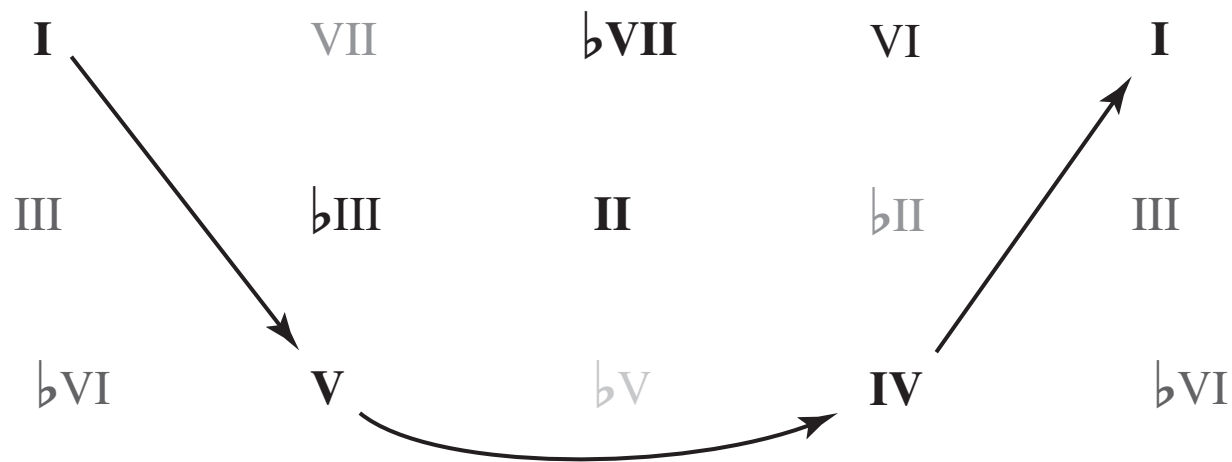
Q1: What can we say about the “wraparound” progression, which takes us from the last chord to the first?

Shepard-tone Passacaglias



A1. It should also feature short distance rightward motion.

Shepard-tone Passacaglias



*A1. It should also feature short distance rightward motion.
 Q2. What should this mean about the voice leading of the entire progression?*

“Helpless”

The image shows a musical score for a piano piece. The score is written in D-flat major (three flats) and consists of four measures. The first measure is the tonic chord (I), the second is the dominant (V), the third is the subdominant (IV), and the fourth is the tonic (I). The notes in each measure are: Measure 1: C4, F4, Bb4; Measure 2: C4, F4, Bb4; Measure 3: C4, F4, Bb4; Measure 4: C4, F4, Bb4. Arrows indicate a circular descending motion: from the top note of Measure 1 to the middle note of Measure 2, from the middle note of Measure 2 to the bottom note of Measure 3, from the bottom note of Measure 3 to the bottom note of Measure 4, and from the bottom note of Measure 4 back to the top note of Measure 1. A dashed arrow also points from the bottom note of Measure 3 to the top note of Measure 1, completing the circle. A speaker icon is located to the right of the score.

“D \flat :” I V IV I

Continuous circular descending motion. David Feurzeig, in a slightly different context, calls this a “Shepard-tone passacaglia.”

Q3. Does this create helplessness?

Canon a 3 a la Neil Young



There is a town in north Ontario,
With dream comfort memory to spare,
And in my mind I still need a place to go,
All my changes were there.

These continuous descending melodies make these progressions ideal for repeating riffs; they likely contribute to a sense of inevitability, rightness, “groove,” etc.

“Eight Days a Week” (The Beatles)

A2 A3 A5

I VII bVII VI I

III bIII II bII III

bVI V bV IV bVI

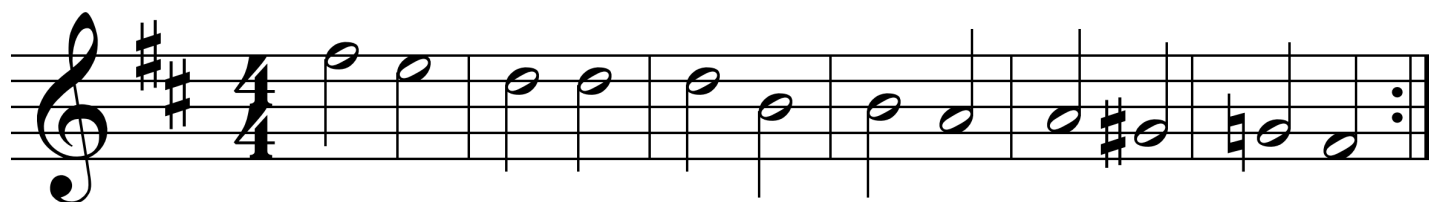
3 2 1

Ain't got nothin but love, babe ...

D: I II IV I

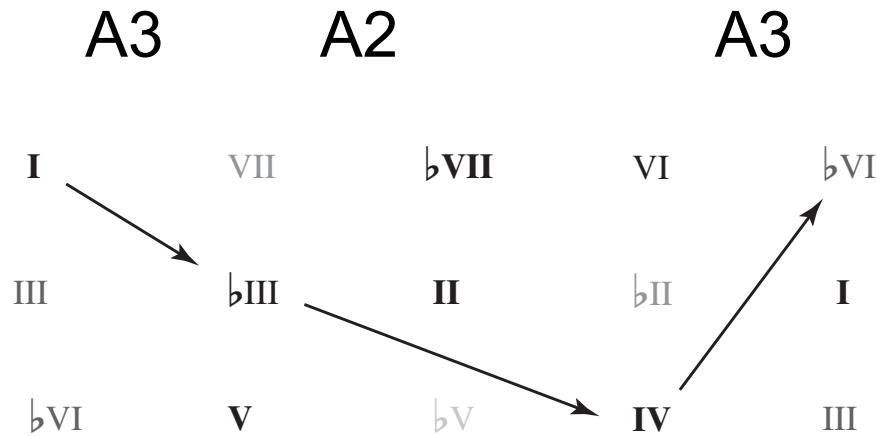
Again, the progression is structured around a “retrofunctional” IV-I cadence, rather than a functional V-I progression. But the stepwise descending melody (connecting tonic-triad notes) is clear.

Canon a 3 a la the Beatles



Ooh I need your love babe
Guess you know it's true
Hope you need my love babe
Just like I need you

“Steppin’ Stone” (Paul Revere & The Raiders)



8 7 #6 b6

5 4 3 1

harmony

lead vocal

e: I III IV VI

“Pentatonic Urlinie”

Inner voices do not continually descend, but melody does



“You Won’t See Me” (The Beatles)

	A2	A3	A5	
I	VII	\flat VII	VI	I
III	\flat III	II	\flat II	III
\flat VI	V	\flat V	IV	\flat VI

$\hat{5}$ $\hat{4}$ $\hat{3}$
 $\hat{3}$ $\hat{2}$ $\hat{3}$

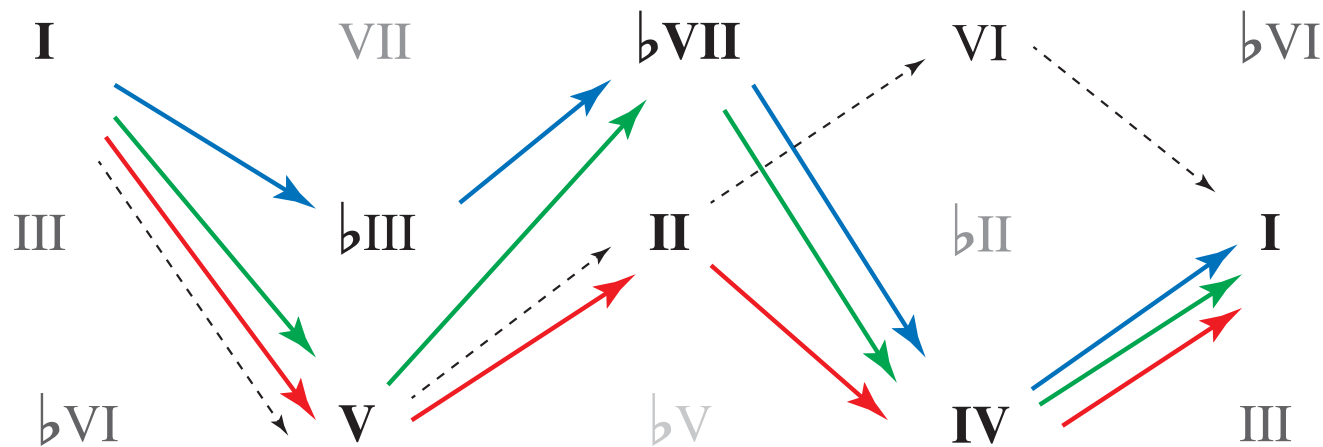
harmony

lead vocal

Inner voices continually descend.

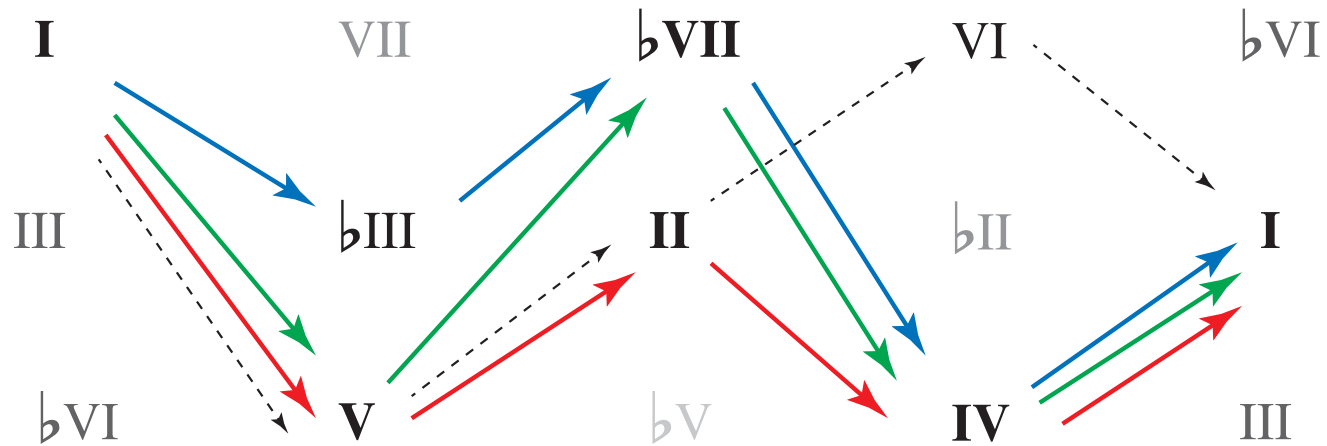


Theorizing Shepard-Tone Passacaglias



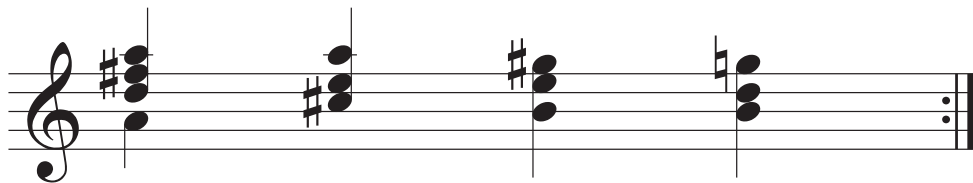
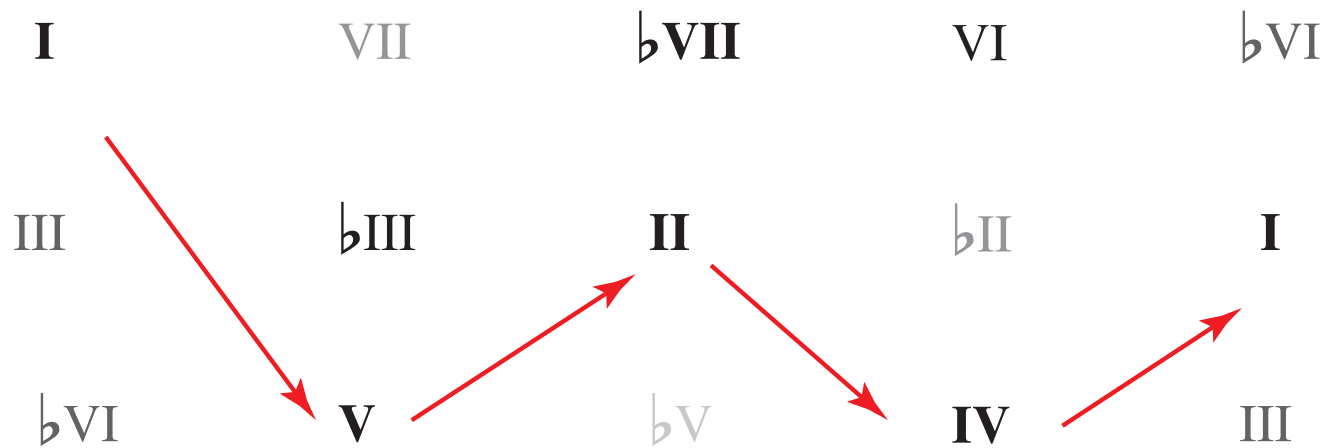
There are four repeating rightward paths through the space that avoid (a) global tritone relationships and (b) immediate semitonal motion.

Theorizing Shepard-Tone Passacaglias



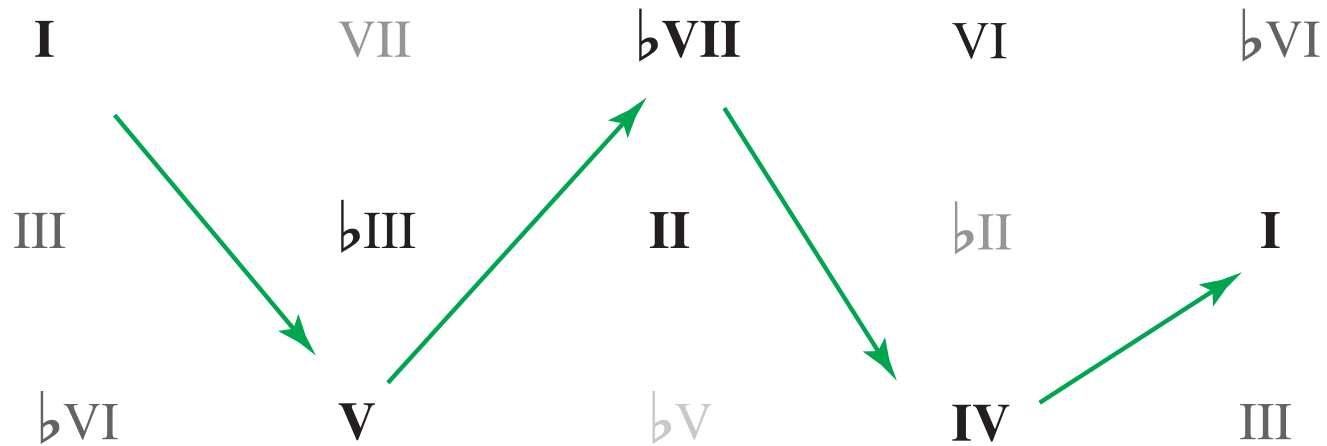
Three of them are quite common; they correspond to the three families discussed in the first section.

Theorizing Shepard-Tone Passacaglias



Elliott Smith, "Rose Parade"
Pixies, "Here Comes Your Man"

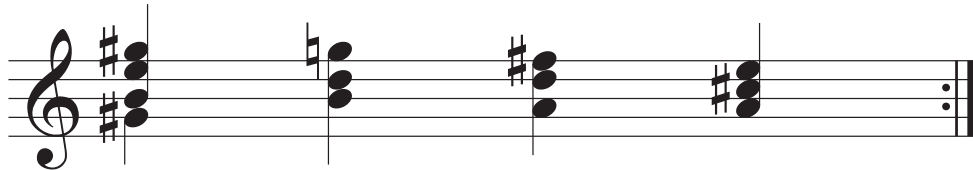
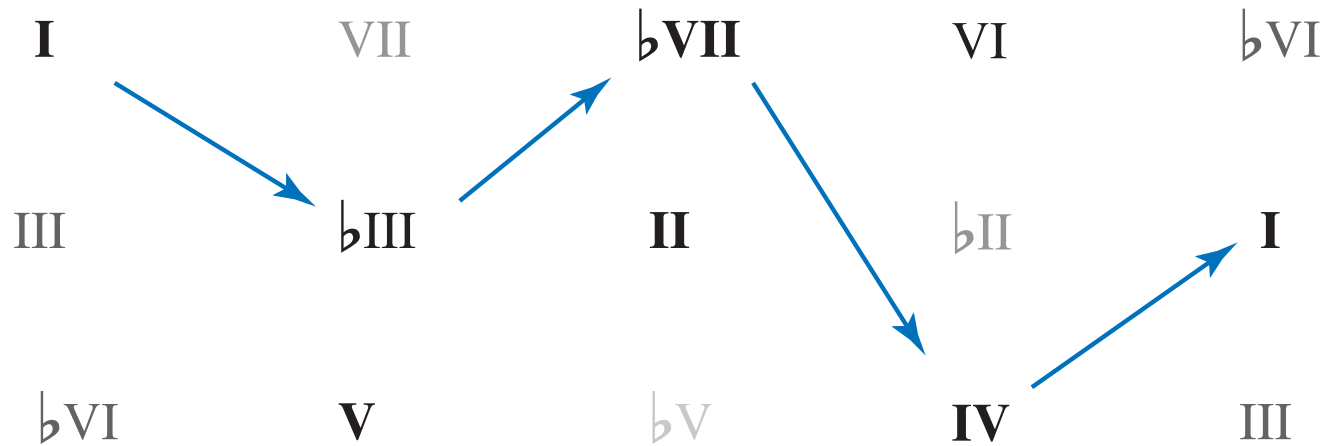
Theorizing Shepard-Tone Passacaglias



Duran Duran, "Rio"
Aretha Franklin, "Natural Woman"

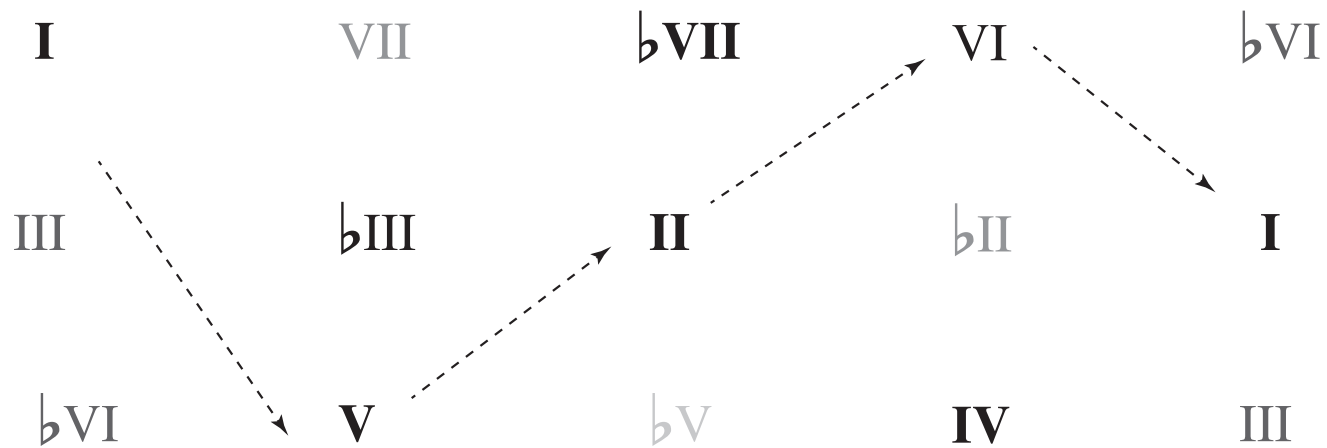


Theorizing Shepard-Tone Passacaglias



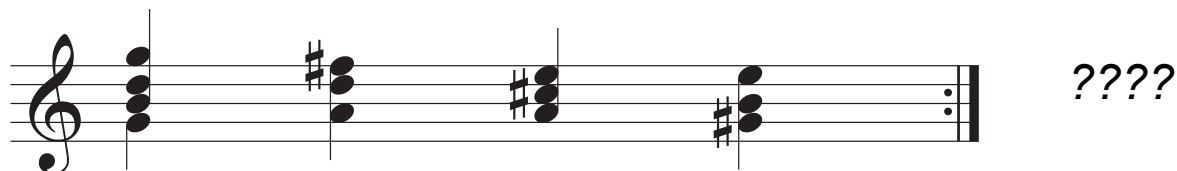
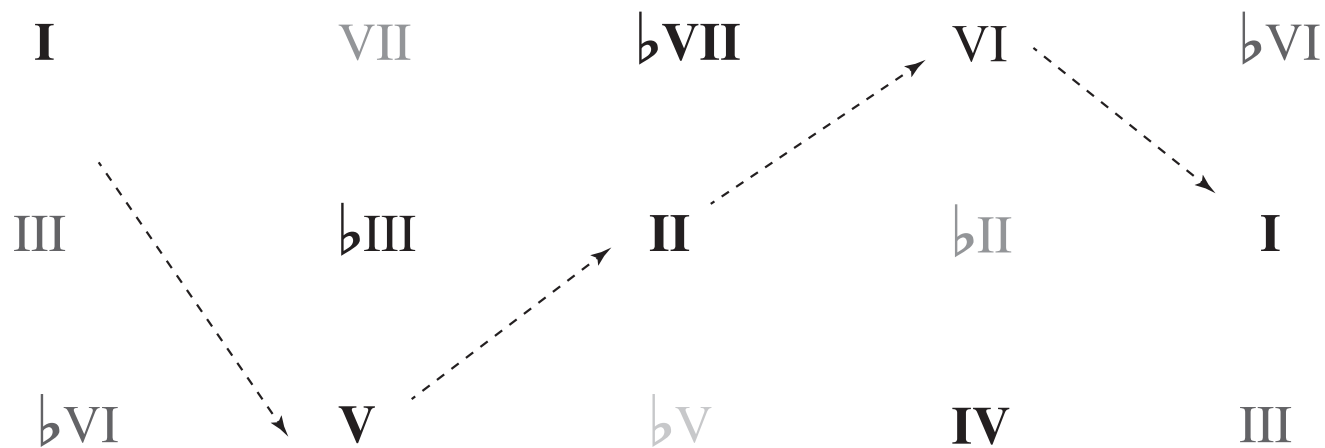
Tears for Fears, "Mad World"
White Stripes, "Air Near My Fingers"
Status Quo, "Matchstick Men"

Theorizing Shepard-Tone Passacaglias



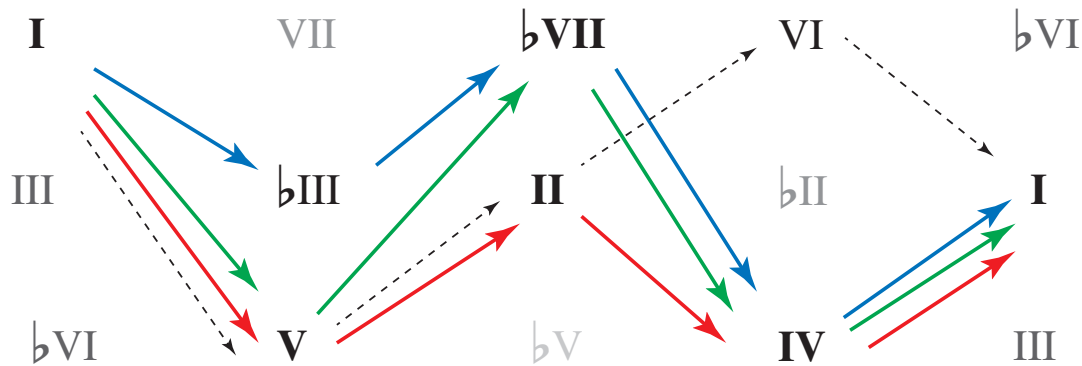
Perhaps VI–I provides an insufficiently strong, quasi-cadential return to the tonic.

Theorizing Shepard-Tone Passacaglias



Worth re-emphasizing that almost all of our examples return to the tonic with IV-I, bVI-I, or bVII-I

Out of four, one



The four paths are rotationally equivalent!



*“Rose Parade”
“Here Comes Your Man”*

“Rio”

“Air Near My Fingers”

???

Digression: phrase-based modulation

- O-Zone's "Dragostea din Tei" features a repeating progression (F-C-G-Am), heard sometimes in C major (IV-I-V-vi) and sometimes in A minor (i-VI-III-VII), with the changes almost entirely controlled by instrumentation and phrasing.
- Centricity controlled by hypermeter, melody, and instrumentation.
- 4-bar phrasing almost throughout the entire piece; only once (the first time) is there an extra bar of G major, setting up the shift to A minor.



Conclusion

- Neil Young did not know he was writing a canon in four voices
- Awareness of the canon can change (deepen? enrich?) our appreciation of the music
 - **But** ... the canon is not an accidental fact about the piece
 - It is a more or less inevitable byproduct of a commitment to quasi-diatonic harmony and descending melodies
 - Virtually every repeating progression of this sort will create a similar canon
- What does this mean for theory?
 - Theory can identify structures that composers only implicitly understood
 - By making these structures explicit it can change our relation to music

PART III

Some Renaissance Examples

Heinrich Schütz (1585–1672)

- Schutz's *Psalmen Davids* (1619)
 - Largely triadic (very few seventh chords)
 - Many more major than minor chords
 - Only sometimes tonally functional
 - Largely but not exclusively diatonic
- In all of these respects it is similar to rock
- Before the common practice, not after.

“Wie lieblich” (Schütz)

mm. 136–146

“Natural Woman”/“Rio” progression

ascending fifths

ascending fifths

d: i V

e: i V I

arrows show a “Shepard tone” effect of continuous descent with octave transfers



Schütz’s “Wie lieblich sind deine Wohnungen,” SWV 29,
mm. 136-146

“Warum toben” (Schütz)

mm. 25–31 *ascending fifths, as in
“Hey Joe,” “Time Warp,” etc.*

The musical score consists of two staves. The upper staff is in treble clef with a key signature of one flat (B-flat). It contains a sequence of chords: a B-flat major triad (Bb, D, F), a B-flat major triad with a sharp fourth (Bb, D, F, Ab), a B-flat major triad with a sharp fourth and a sharp fifth (Bb, D, F, Ab, C#), a B-flat major triad with a sharp fourth and a sharp fifth (Bb, D, F, Ab, C#), a B-flat major triad with a sharp fourth and a sharp fifth (Bb, D, F, Ab, C#), a B-flat major triad with a sharp fourth and a sharp fifth (Bb, D, F, Ab, C#), and a B-flat major triad with a sharp fourth and a sharp fifth (Bb, D, F, Ab, C#). The lower staff is in bass clef and contains a sequence of notes: Bb, D, F, Ab, C#, Bb, D, F, Ab, C#, Bb, D, F, Ab, C#.



Schutz’s “Warum toben die Heiden,” SWV 23, mm. 25–31

“Es woll’ uns Gott genädig sein” (Bach)

*retrofunctional series of ascending fifths,
embellished by F \sharp ₅*

The image shows a musical score for the end of Bach Chorale 16. It consists of three staves: a vocal line at the top and a piano accompaniment below. The key signature is D major (two sharps). The vocal line features a series of chords: D major (IV⁶), D major (I), B minor (iv⁶/iv), B minor (iv₄⁶), F \sharp major (V₅⁶), D major (i), and D major (V). The piano accompaniment provides harmonic support with a similar sequence of chords and melodic lines.

D: IV⁶ I b: iv⁶/iv iv₄⁶ V₅⁶ i V
?!?



Bach Chorale 16 (Riemenschneider ed.), end

K333, III, m. 40ff (Mozart)

G: $IV_{4/4}^6$ I IV/IV IV^6 $I_{4/4}^6$ V

Retrofunctional moments occur in the classical tradition, but they are very rare!



Conclusion

- Renaissance harmony and rock harmony are on opposite ends of the functional harmonic tradition.
- Because functional-harmonic constraints are weaker, they are freer to exhibit the deepest sorts of musical logic, in a very explicit way:
 - Descending stepwise melodies
 - Quasi-diatonic progressions
- The harmonic resonances between the two styles are not accidental or superficial.
- Theory can help us understand the “hidden roads” between pieces and styles.

PART IV

Functional and Retrofunctional

Functional Harmony: Theory

- Conventional descending fifth progressions support descending melodies only in limited circumstances.
 - In particular the triadic V-I progression supports only a 2-1 melodic descent.
- This helps us understand some deep facts about tonal harmony.
- For instance ...
- Suppose you wanted to design a musical style with lots of descending fifth motion and lots of stepwise melodic descents. What would you do?

What Would You Do?

- First, use V^7 rather than V , as well as vii° and $vii^{\circ 7}$. This permits many more stepwise descents.

$\hat{2}$ $\hat{1}$ $\hat{4}$ $\hat{3}$ $\hat{4}$ $\hat{3}$ $\hat{6}$ $\hat{5}$

The image shows a musical score with two staves. The right staff (treble clef) contains four measures of chords. Above the first measure is the number $\hat{2}$, above the second $\hat{1}$, above the third $\hat{4}$, above the fourth $\hat{3}$, above the fifth $\hat{4}$, above the sixth $\hat{3}$, above the seventh $\hat{6}$, and above the eighth $\hat{5}$. The left staff (bass clef) contains a single line of notes corresponding to the numbers above: 2, 1, 4, 3, 4, 3, 6, 5.

*covers all stepwise descents
to the tonic triad!*

only $\hat{7}$ - $\hat{6}$ requires new harmony

What Would You Do?

- Second, use I_4^6 to connect ii and V.
 - **NB:** ii-V permits only one stepwise descent in the melody, $\hat{6}-\hat{5}$.

$\hat{6}$ $\hat{5}$ $\hat{4}$ $\hat{3}$ $\hat{2}$ $\hat{2}$ $\hat{1}$ $\hat{7}$

The image shows a musical score for a ii-V progression in 6/4 time. The treble clef contains three chords: ii (F, A, C), V (D, F, A), and I (C, E, G). The bass clef contains a stepwise descending line: 6, 5, 4, 3, 2, 2, 1, 7. The notes are: ii (F, A, C), V (D, F, A), I (C, E, G).

PART V

Conclusions

Schenkerian Themes

- A key Schenkerian idea is that “voice leading produces harmony.”
 - That is, apparently “harmonic” progressions are being created by subterranean and more fundamental voice-leading forces.
- On this level, I’m Schenkerian.
 - I am proposing that a number of widespread rock harmonic routines arise out of the desire to harmonize descending melodies.
- Triadic voice leading, left to its own devices, produces *retrofunctional harmony*: harmony that emphasizes ascending fifths and minor thirds, rather than traditional progressions.
- Nonfunctional music provides an ideal environment for playing with deep voice leading facts
 - At least, compared to functional tonality

Schenkerian Themes

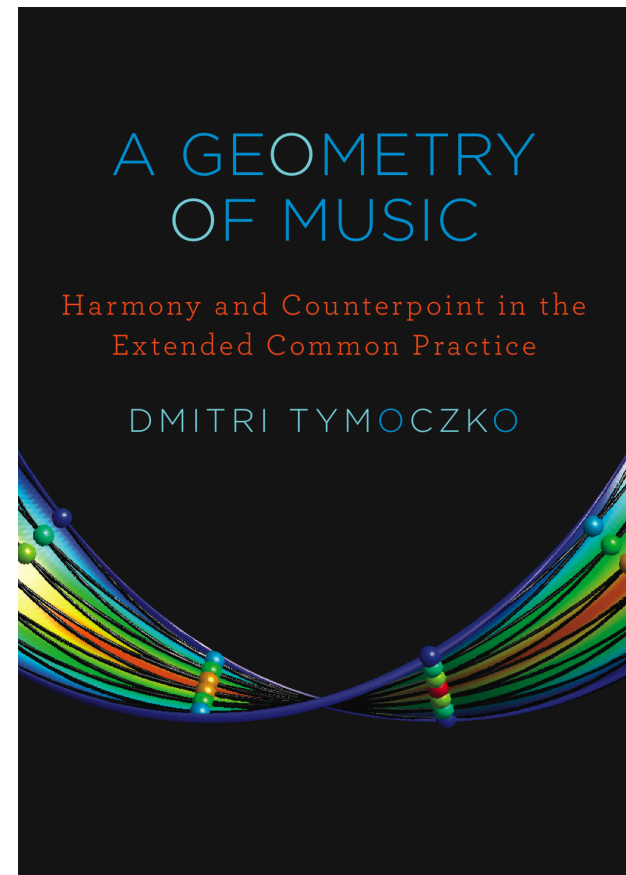
- Some theorists have hoped that we can *derive* the norms of functional harmony from deeper voice-leading principles, including the norm of descending melodies.
- In fact, there is actually a subtle *conflict* between these two principles:
 - continuously descending voice leading is very naturally embodied by “retrofunctional” progressions such as I-V-IV-I, I-II-IV-I, and so on.
- This strongly suggests that the harmonic and melodic principles operating in functional tonality are independent.
 - Tonal composers try to create stepwise descending melodies *within the constraints dictated by the harmonic grammar*.
 - That grammar is *not* a byproduct of the melodic intentions.

Schenkerian Themes

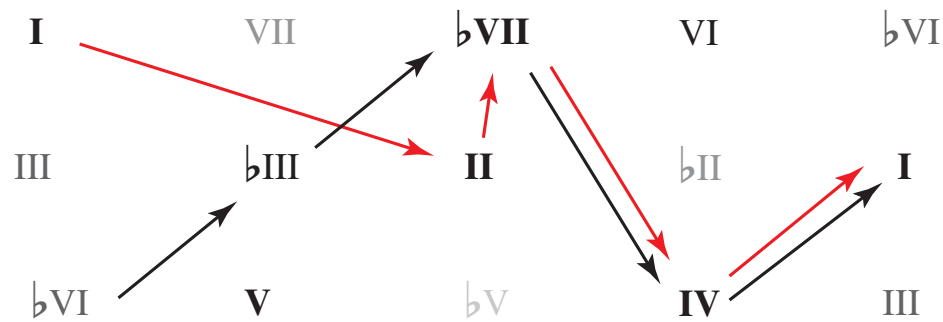
- To put it bluntly: *functional harmony is unnatural.*
- Rock composers, like late 16th and early 17th-century composers, inhabit something like the musical “state of nature.”
- This is not a bad place to be!

Thank you!

Thanks to David Feurzeig and Walt Everett for helpful conversations!



“Time Warp” (Rocky Horror Picture Show)



guitar $\hat{b}3 \hat{2} \hat{1}$
 $\hat{8} \hat{b}7 \hat{6} \hat{5} \hat{8} \hat{b}7 \hat{6} \hat{5}$

A: I V/V (?) IV I
 IV/IV (?)

