

Lobbying for a La-Based Approach to the Minor Tonic in Popular Music Harmony

Hello, everyone. Let's begin with a simple task: singing tonic. [NEXT] I am going to play the verse section from the song "Down Under," and after it's finished, please sing tonic using whatever solmization system you want. [NEXT] (Sing tonic). Great. [NEXT] The tonic you just sang was B, and as you may have noticed, it was a minor tonic. Given this tonic, the prevailing approach among music theorists who study popular music is to label the Roman numerals as shown here. [NEXT]. Note that the standard approach to Roman numerals in popular music is to base them off the parallel major, so a G major chord in B minor is FLAT-SIX, the same as a G major chord in B major. This is a Do-based approach to the minor tonic, which highlights similarities between progressions in parallel keys.

OK, let's play that singing tonic game again. [NEXT] This time, I'll play the chorus of the song, and after it's finished, please sing the tonic of the chorus [NEXT]. (Sing tonic). Very good. The tonic you now sang was D, and as you may have noticed, it was a major tonic. [NEXT]. Given a tonic of D major, I think we can all agree on the appropriate Roman numerals. The analysis of the verse and chorus shown here epitomizes the standard way to handle minor and major pitch centers in popular music, and indeed, Chris Doll [NEXT] analyzes this song using these exact Roman numerals in his 2011 article. Note that the Roman numerals imply rather different hearings of the chords in the verse and chorus. But aside from the chords on the downbeat of the first and third measures of each section, [NEXT] circled in red, the two passages have almost identical harmonic and melodic content. I don't want to downplay the effect of those chords circled in red. Like you, I hear the verse as more strongly centered on B minor, and the chorus as more strongly centered on D major.

But for me, the Roman numerals shown here exaggerate or misrepresent the difference in how I hear harmony in these two sections. Specifically, I do not hear in this case a relationship between parallel keys, as the Roman numerals suggest. Instead, I hear a play between two relative keys. As a result, I believe a better reflection of what's going on in the music is to use a La-based approach to the minor tonic, as shown here [NEXT]. A La-based approach takes the minor tonic to be the SIX chord rather than a new or different ONE chord. My goal for the rest of today is to show why a La-based approach, rather than the prevailing Do-based approach, makes sense for the analysis of harmony in popular music.

One problem with a Do-based approach is that it often forces a false choice about whether a song involves a modulation, a tonicization, or something else. [NEXT] Consider, for example, the song "Hotel California". The chords for the verse and chorus are shown here. I won't ask you to sing tonic, but as you listen to the song, think about what chord or chords might be tonic, what key the song is in, whether the song modulates or tonicizes certain tonal areas, that kind of stuff. [NEXT] I would guess that many of you, if you had to choose, would say that the song is in B minor, and I don't disagree that there is a strong emphasis on B minor. So you might analyze the song using the Roman numerals shown here [NEXT], which is exactly how David Temperley analyzed the song in our 2013 corpus of rock music. But there is something unsatisfying about this analysis, particularly with those G and D chords at the beginning of the chorus where it sounds like a move to D major, if only briefly. Temperley's Roman numeral analysis illustrates what I call a "MAY-based major" approach, since the major tonic is represented as FLAT-THREE. This FLAT-THREE major tonic is a typical and I would say problematic byproduct of Roman numeral analyses of popular music using a Do-based approach to minor.

In contrast to Temperley, [NEXT] my encoding of the song from our 2013 corpus uses a two-bar modulation at the beginning of each phrase in the chorus. So my version arguably better accounts for that feeling of moving to the relative major there. But then again, I don't really hear it as a modulation. [NEXT] Notice also that I didn't change key in the second phrase of the verse, even though it's the exact same chord progression as the second phrase of the chorus. Basically, Temperley and the 2013 version of me are getting tangled up by our Do-based approach to harmony, which really isn't what's going on in the song. [NEXT] I now believe a better approach is to simply accept the SIX chord as the minor home. This approach also accepts that the dominant of the minor tonic—F sharp in this case—is a major THREE chord. Now you might feel that taking the dominant of the minor tonic to be THREE is equally as whacky as taking FLAT-THREE to be the major tonic. But you're going to have to choose one or the other, and I would say a LA-based minor is more preferable than a MEY-based major.

[NEXT] It's worth mentioning that Drew Nobile has a forthcoming article on double-tonic complexes in rock. In many ways, Nobile's article sets the groundwork for what I'm talking about today, in that the issue is not really tonal ambiguity; it's not like I can't tell whether "Hotel California" is in B minor or D major, it's more like it's in both at the same time. Nobile, though, limits the application of the double-tonic complex to a small set of cases, whereas I see it as a broader model for popular music. Nobile also doesn't address how Roman numerals should be used given a double-tonic complex, whereas I posit that a La-based approach is a workable solution.

[NEXT] As another example of two relative keys happening at once, consider the song "Treasure" by Bruno Mars. The entire song is built off an 8-bar harmonic loop, one iteration of which is shown here. [NEXT] Since you can probably guess where my argument is headed, here are the chords

in Roman numerals using a La-based approach. Note that the song has no E-flat major chord—no “one” chord. [NEXT] If you’re familiar with Mark Spicer’s 2017 article, you might say that this song is an example of an absent tonic. But I hear the C minor chord at the end of the first phrase, what I have labelled as the SIX chord, as the minor tonic. So there is at least one tonic here. And even though the E-flat major chord—the “one” chord—may be absent, it is strongly implied. The A-flat over B-flat chord in the last two bars, for example, sounds like a V9sus4 in E-flat major. [NEXT] As well, you can hear the vocals descend 5-4-3-2-1 in E-flat major in the first and fifth bars. Perhaps we have a melodic-harmonic divorce here, where the melody is in one key and the chords are in another. But I think it’s simpler to just say this song is in both C minor and E-flat major, playing with those two available tonics. Let’s listen [NEXT].

[NEXT] I should also point out that the La-based approach to minor is common among professional studio musicians. Here, for example, is an excerpt from a chart for the song “Rolling in the Deep” by Adele. This chart was created by Chas Williams, a well-known session musician here in Nashville. I don’t have time to get into the details of a Nashville chart today, but as a very quick explanation, each of the large numbers represents a chord that lasts a bar, with underlined or boxed numbers representing multiple chords in a bar. The numbers themselves are Arabic versions of Roman numerals. So the verse, indicated by the big “V” in the top left, begins with a SIX minor chord, which is a C minor chord in this case. [NEXT] Here are some pop chord symbols, in red, to help you follow along. Like the Bruno Mars song we heard earlier, this song has no “one” chord, which would be E-flat major here as well. That said, in the prechorus section, which Nashville players refer to as the “Channel”, the FOUR and FIVE chords—A-flat major and B-flat major, respectively, sound to me like true FOUR and FIVE chords, as if the song is flirting with a move to the relative major. [NEXT] Yet there is a G7 chord at the end of the prechorus, notated as a

THREE SEVEN, which is the dominant of C minor. So the song never really escapes C minor. Let's listen [NEXT].

Notice in this song how many A-flat and B-flat major chords there are, which are the FOUR and FIVE chords of the relative major, and how few F minor or D diminished chords there are, which would be the FOUR and TWO chords in C minor. We thus find more chords in this song deriving from the relative major than the parallel major, statistically speaking, excluding tonic. In that regard, let's take a brief detour into some statistics on a broader scale. [NEXT] Here are the overall stats on chord roots that Temperley and I reported for our corpus. These are all upper-case Roman numerals, since we just tallied the chord root and ignored chord quality. Notice that after FOUR and FIVE, FLAT-SEVEN is the most common chord root. Note also that FLAT-SIX and FLAT-THREE are relatively common chord roots, at least as compared to the truly chromatic roots like FLAT-TWO and SHARP-FOUR. But as I alluded to earlier, Temperley and I analyzed this corpus primarily using a Do-based approach to minor. Let's see how that approach plays out as we tease apart the data.

[NEXT] On the right is a table with the stats for just those songs in the corpus with only a major tonic. FLAT-SEVEN turns out to be not as common as it was in the overall statistics. Notice also how much FLAT-THREE and FLAT-SIX have dropped in terms of frequency. Those chords are not much more common than the chromatic chords at the bottom. [NEXT] Now let's compare this distribution to the distribution of chord roots for those songs with a minor "one" chord, as shown in the new table on the left. As you can see, here is where half of the FLAT-SEVEN and most of the FLAT-SIX and FLAT-THREE chords can be found. If these were statistics from a corpus of classical music, we would see the distribution of chord roots to be similar between parallel major and minor keys—with FIVE being the most common chord after tonic in both, TWO

and FOUR being the next most common chords in both, and so on. But this is popular music, and the chord palettes for parallel keys are rather different. As an attempt to quantify this difference, I calculated between chord roots a weighted sum of squares error known as chi-squared, which is used by statisticians to assess the goodness of fit between two distributions. [NEXT] So for example, The FIVE chord in a minor key is about 13.2% of the total, which is compared to the total for FIVE in a major key, which is about 18.9%. [NEXT] This gives a chi-squared statistic of about 28,000, which is a huge error and implies a very bad fit.

[NEXT] In contrast, I re-encoded all the songs with a minor “one” chord using a La-based approach, and the stats for that are shown in this new table on the left. Note now how the most common chords in the minor key are simply all of the chords in the diatonic major scale. If I calculate the weighted sum of squares error on this La-based distribution as compared to the major distribution, the chi-squared statistic equals about 2,800 [NEXT] — one tenth of the value from the Do-based distribution. Now to be clear, a chi-squared of 2,800 is still very high. But there is less difference between the La-based minor encoding and the major key than the Do-based minor encoding and the major key. That is to say, the distribution using a La-based approach “fits” the distribution of chords in a major key better than the Do-based approach.

Let’s bring this home to pedagogy. [NEXT] Here is how I expect many of us teach the diatonic chords in a major key. For popular music, this does not really represent what generally happens in practice, though. [NEXT] In particular, the diminished chord on scale-degree seven is fairly rare. So when I teach classes on harmony in popular music [NEXT], the FLAT-SEVEN chord is my tweak to the otherwise diatonic palette. Not that long ago, I used to teach chords in a minor key using a Do-based approach, as shown here. [NEXT] But this past semester, I started teaching chords in a

minor key using a La-based method, which is simply a rotation of the chords in a major key. [NEXT] From a practical perspective, I find my students pick up this pattern much more quickly, since it just involves a shift in tonal center rather than a whole new system. The students simply have to recognize that the THREE chord—as the dominant of the SIX chord—will sometimes appear as a major chord, which turns out to be a nice preparation for getting them ready to think about applied chords. Another strength of this method is that it highlights the rotational aspect of harmony, which is such a common feature of popular music.

[NEXT] As a famous example of chord rotation, consider the “Axis” progression—C major, G major, A minor, and F major—and its various rotations and transpositions, which is ubiquitous in popular music. [NEXT] Sometimes this progression is labeled with the C major chord as “one”, other times the A minor chord is labeled as “one”, often based on which chord comes at the beginning of the hypermeasure. But it’s not just meter that affects our hearing of this progression. Mark Richards devotes his 2017 article to exploring when and how the “Axis” progression sounds as if it’s in a minor key or a major key and ultimately argues that the melody is a central factor. But I think the need to decide whether this progression sounds like it’s in a major key or its relative minor is missing the point. The Axis progression, like much of popular music, is not in either major or minor; it is in both. I hear both the C major chord and the A minor chord as viable tonics, each of which counterbalances the other.

[NEXT] As a final example that shows this counterbalance, consider the song “Umbrella” by Rihanna, which uses the Axis progression. You should hear the D-flat chord as the major tonic, and the B-flat minor chord as the minor tonic. If you are a Do-based person, you might be unsure which of these tonics is the true and only tonic. The G-flat to D-flat motion at the beginning of the chorus will tilt your ear toward the D-flat major tonic. But

then in the post-chorus, the F chord will probably tilt your ear toward the B-flat minor tonic. But then the Bridge arrives, with a tilt back to the D-flat major tonic. Yet at the end of the Bridge, the F major chord returns to point us back to the minor tonic. If all this tilting is making you nauseous, perhaps you might just accept the medicine I'm offering [NEXT]. I accept the SIX chord as the minor tonic. I accept the THREE chord as the dominant of the minor tonic. If this sounds a bit religious, well, solmization systems are belief systems fundamentally, and I realize I may sound heretical for going against the orthodoxy of the Do-based approach. I'll touch on that briefly in my conclusion, but first let's listen to this song. [NEXT].

Honestly, I would be surprised if I have convinced everyone here today to abandon their Do-based approach in favor of a La-based approach when analyzing popular music. My viewpoint derives from analyzing and encoding lots of music, and it's hard to recreate that experience in a 20-minute talk. I also want to clarify that I do not believe that a Do-based approach is always inappropriate when analyzing popular music. Most twelve-bar blues songs in a minor key, for example, have a strong parallel-key relationship to the major tonic. So using one approach versus another is somewhat contextual, and unfortunately I don't have a simple rule to offer today on when to choose one approach over another. But I do think that the La-based approach should be our default method for popular music from the last half century, in contrast to the current default of the Do-based approach, which I feel like we have somewhat carelessly copied and pasted over from our analyses of classical music. Ultimately, my hope is that by using a La-based approach, we'll find patterns of harmony in popular music that were previously obscured by our Do-based approach, and as a result, we'll move closer toward a cohesive grammar of harmony in popular music.