

Reverse Extensions and Multi-Layered Experiences of Harmony in Drake's Harmonic Loops

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Introduction

The top single of 2018, “God’s Plan” by the Canadian R&B/hip-hop artist Aubrey Graham (better known by his stage name, Drake) is strikingly conflicted, and like many Drake songs, this conflict comes not just from its lyrics, but from certain kinds of ambiguity in its harmonies. In a music-analytic survey of the year’s Top 5 singles, the guitarist and blogger Dean Olivet exclaims, “Man, the chords in this loop were hard to identify.” He continues,

[...] they start out as ninth chords whose upper halves are louder and more timbre-distinct than their lower, arpeggio-happy halves. It’s almost like it’s better explained not as “9-chords,” but as “an Em stacked on top of an Am,” and then “a D chord stacked on a G chord.” This “separation” thinking is enhanced by the low-muffled organ patch playing the Am and G, and the more trebly organ patch playing the Em and D. (Olivet 2019)

Olivet’s wording “it’s almost like” highlights something counterintuitive: he still hears these stacked triads as one single harmony (rather than a truly “polytonal” combination of unrelated chords). These multilayered harmonies are part of how “God’s Plan” creates an atmosphere that is, in the words of the music critic Chris Molanphy (2018), “shimmering,” “hypnotic[,] and seductive”; and they seem especially meaningful in conjunction with Drake’s famously conflicted lyrics, which are full of fake friends, unfaithful lovers, and an uneasy layering of braggadocio with self-doubt and regret.

The “separation thinking” which Olivet describes sounds a lot like what Trevor de Clercq (2019) calls a “harmonic-bass divorce.” Allan Moore (1993, 31–32; 2012, 20–21) has previously described rock music as having four distinct functional layers: the “explicit beat layer” (the drum kit and other percussion), the “functional bass layer,” the “harmonic filler layer” (played by “harmony instruments” like piano or rhythm guitar), and the “melodic layer” (usually the lead singer or a solo instrument). In this scope, “harmony” has two common meanings: (1) the chord played in a song’s harmonic layer at a certain point in time, or (2) the combined sonority of all layers (de Clercq 2019, 272). A “harmonic-bass divorce” refers to moments in rock music in which the bass and harmonic layers seem to move independently, similar to the

“melodic-harmonic divorce” discussed earlier by Drew Nobile (2015) and David Temperley (2007).

But some harmonies in Drake’s music seem to invite both integrated hearings and hearings of harmonic-bass divorce, and the conflicted, multilayered experiences they evoke seem like more than just a terminological or analytical ambiguity. As de Clercq (2019, 272) admits, “while it is true that divorced partners are no longer directly related, they are often indirectly related or related through just a single degree of removal.” In this article I define “reverse extension”—a new term for adding thirds below the root of a chord, and for thinking about third-related chords—as a way to quantify the “relatedness” in some harmonic-bass divorces, and to theorize the multilayered experiences they can create. As I’ll explore later, reverse extensions are similar to Drew Nobile’s (2020) “double-tonic complexes” in rock music, affording similar properties of plural chord identity and harmonic indeterminacy; but while Nobile presents these as properties of a unique double-tonic sonority (a hybrid between a I and vi chord), I show how these properties can occur anywhere in the scale. Reverse extensions are especially relevant within recent multi-layered, multi-author, loop-based digital music production. While a harmonic loop may be fixed and unchanging, the chords within that loop remain open to revision when a new bass line is added to create a reverse extension, potentially creating multilayered, plural experiences of harmony.

Another goal of my article is to move away from the objective language used in previous discussions of harmonic divorce, and instead build from jazz theory to develop an alternative model of “divorcedness” or “integratedness” as subjective effects which are enacted by listeners (and when I say “listeners,” I mean to include performers, producers, and songwriters). Temperley (2007), Nobile (2015), and de Clercq (2019) each attempt to authoritatively distinguish between musical moments which are divorces, and those which are not; but I argue that reverse extensions can often afford both divorced and integrated hearings. Following Christopher Doll (2017, 15 and 218), I understand a chord’s identity and functions to be subjective “effects” rather than objective analytical truths. From this perspective, independence between harmony and bass is another subjective effect. In developing a more subjective ontology, I hope to get closer to the experience of listening and making music, by describing (1) the open-ended possibilities for adding new layers to a chord by changing the bass line, and (2) the multi-layered, plural experiences of harmony these moments seem to invite.

One last goal is to help fill a void in scholarship on hip-hop and R&B genres. Drake pioneered a hybridized rapping and singing style, arguably transforming or reinventing both rap (Caramanica 2019) and R&B (Leight 2018). Countless metrics testify to Drake’s superlative streaming and sales, but perhaps the bluntest is that he

“generated more U.S. on-demand streams in 2021 [8.6 billion] than all pre-1980 records combined” (Caldwell 2022), an astounding feat for an artist whose musical career began only twelve years earlier, in 2009. Drake is one of the most widely heard musicians in human history, and yet, his music hardly appears in the field of music theory. Additionally, there is hardly any scholarship on harmony in hip-hop and R&B, (other than Richard Desinord’s 2021 video lecture about neo-Soul and R&B harmony; see also his 2022 dissertation about harmony in gospel music), part of the broader underrepresentation of Black music and scholars within what Philip Ewell (2020) calls “Music Theory’s White Racial Frame.” My hope is that by studying one of today’s most popular Black artists I can contribute, albeit in a small way, to uncovering and undoing the field’s biases and blind spots.

Defining Reverse Extensions

A “reverse extension” can be either a literal chord-to-chord motion, or a more abstract relationship between chords. An example sung by the “Queen of Hip-Hop Soul” Mary J. Blige illustrates the motivation and applications of this term. There’s an old bass-player joke that goes, “it’s not a C chord until I play a C.” The opposite occurs in Example 1, the opening to Blige’s song “Be Without You” (2005): the bass line starts on the root of a Dm chord, then creates a new harmony by moving down a third to B \flat . While the bass moves, the notes in the melody and harmony layers repeat without any alterations. One can hear the Dm chord continuing through the whole measure, creating a bass-harmonic divorce; but a more integrated hearing is also possible, with the new bass note making a new chord, B \flat maj7. This B \flat maj7 chord can be described as a “reverse extension” of Dm.¹ As I will explain below, this harmonic relationship has already been observed in jazz theory, especially in research on postbop jazz by Keith Waters (2016) which builds on an article by Steven Strunk (1979); but harmony in Drake’s contemporary hip-hop/R&B is quite different from either the classical harmonic functions of tonal jazz, or the expansive chromatic idiom of postbop. By theorizing this relationship as a “reverse extension,” I am grounding it in a diatonic context, and also highlighting the ambiguous chord identity that leads to such multilayered effects in Drake’s loop-based songs.

A reverse extension is thus both a harmonic-bass divorce and an integrated chord, which potentially can afford multiple different heard roots and chord identities. One advantage of this theoretical plurality is that it reflects the layered and decentralized compositional practice common in today’s popular music. Musical analysis traditionally assumes that each song is conceived by an individual composer, but today songs are often composed in bits and pieces within Digital Audio Workstations by loose networks of collaborators who may be continents apart. Drake often credits

several writers and producers for each track, and in a very literal sense, Drake himself is probably not responsible for the harmonies I analyze below. Noah “40” Shebib is an especially important collaborator who has had a lot of influence on the songwriting and production of every Drake album. However, in my analyses I will often refer to Drake rather than his songwriters or producers, even when it is possible to uncover the creative contributions of each individual, because in popular music the lead artist is often the “persona” through whom songs’ meanings are imagined.² In other words, each compositional choice is often heard as the lead performer’s expression, not the producers’ or songwriters’.

The image shows a musical score for the opening of Mary J. Blige's "Be Without You." It is in 4/4 time and features three parts: Voice, Piano, and a second Piano part. The key signature has one flat (B-flat). The first measure of the voice part is marked with a Dm chord. The second measure is marked with a Dm/Bb chord, which is noted as being equivalent to Bbmaj7. The third measure is marked with a C chord. The lyrics under the voice part are: "I wan-na be with you, got-ta be with you, need to be with you." The second measure of the voice part contains the word "Oh," and the third measure also contains "Oh,". The piano parts provide harmonic accompaniment, with the second piano part featuring a bass line.

Example 1: Piano and background vocal parts from the opening of Mary J. Blige’s “Be Without You.” 2006. (Transcribed by the author.)

In this distributed creative environment, harmonies are never fixed or final, but remain open to additions like reverse extensions, which can give new identities and functions to the harmonies in existing layers. Songs may begin with a sample from a decades-old recording, which might be filtered to isolate the melody or percussion and set with new harmony parts; a new bass line might be added later, perhaps even in a different session or by a different collaborator. Chord charts and lead sheets, when they exist at all, are often post-hoc transcriptions.

Jazz theory provides a framework which easily accommodates this open-ended creative practice and the ambiguities of chord identity that result. Unlike classical music theory, which often focuses on analyzing a fixed score, jazz theory focuses on defining different options for how a musician can add to the music (Stover 2018, 235). In jazz theory a chord progression is always open to addition and revision through techniques of melodic improvisation and harmonic extension and substitution. Jazz theory is also the tradition of music theory which contemporary hip-hop and R&B musicians are most likely to be familiar with, primarily through the Berklee School of Music, which for decades has had a position of unrivalled dominance within popular music pedagogy in the United States. I’ll refer readers to two introductory jazz theory textbooks, *The Berklee Book of Jazz Harmony* by Joe Mulholland and Tom Hojnacki

(2013) and *The Jazz Harmony Book* by David Berkman (2013), and also Chris Stover’s 2018 chapter on “Jazz Theory’s Pragmatics.” But while jazz theory gives us ways of thinking about extended harmonies and chord substitutions that are known to many contemporary popular musicians and will be useful for analyzing Drake’s harmonies, Drake’s music is not jazz. Many of the rules and idioms from these textbooks, especially phrase structure created through ii–V–I cadences and rules about voicing and harmonic function, do not apply to Drake’s chord progressions.

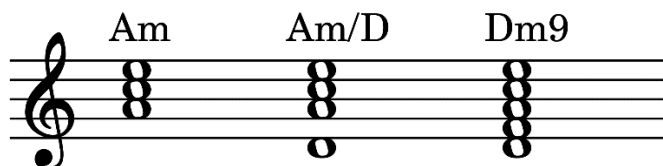


Figure 1: Am/D can sound more like Am or Dm9, depending on the context.

Jazz theory’s epistemology of extended chords provides the mechanisms for understanding the plural identity of reverse extensions. Seventh chords are the basic building blocks of harmony in jazz theory. Unlike classical music, the seventh of a chord is not considered a dissonance; in jazz, sevenths are stable chord tones which need no special preparation or resolution. Another basic principle of jazz theory is to extend chords beyond the 7th, continuing to add thirds upwards to create 9ths, 11ths, and 13ths.³ The Berklee method calls these extensions “tensions,” implying that they do not really change the chord, they just add extra energy (Mulholland and Hojnacki 2013, ix). Extended chords are sometimes analyzed as “slash chords,” identifying the upper extensions as a separate triad; for example, as shown in Figure 1, a Dm9 chord (containing the notes D F A C E) is in many contexts equivalent to Am/D (A minor with D in the bass, or D A C E). Looking at the chord symbol Am/D, one might call A the root of the chord, not the D that’s in the bass; but one could also hear D as the root because of this sonority’s similarity to Dm9. Mulholland and Hojnacki (2013, 215 and 218) describe this as a “polychord” or a “hybrid voicing,” depending on how closely-related the tones appear to be.⁴

Jazz theory’s embrace of plural chord identities resonates with Christopher Doll’s understanding that in rock music, chords’ identities and functions are experiential “effects” or “qualities” rather than objective “structure”—terminology which “is intended to keep the focus at all times on the listening experience itself, as well as to facilitate engagement with multiple, and even contradictory, interpretations of presumably fixed aural stimuli” (Doll 2017, 9). Specifically, Doll (*ibid.*, 70) describes chord identity as a “root effect,” and he cites polychords and added sixth chords as examples of how the same sonority can afford multiple different roots. “Fixed aural stimuli” is a sensible focus for Doll, whose book focuses on “*Hearing Harmony*” in

recorded rock music. But since I am describing reverse extensions as a creative possibility, not just a listening experience, I have grounded my discussion in jazz theory rather than Doll's terms.

With this grounding in jazz theory, I am ready to define a few new terms. The first is a "reverse extension," in analogy to normal extensions: instead of adding additional notes a third higher than the existing chord tones, a reverse extension adds a note a third lower, drawing from the song's established key or scale. An extension of a triad does not change the identity or roles of the original notes; when a Dm chord becomes a Dm9, D remains the root of the chord, and F remains the 3rd, and A remains the 5th. But a reverse extension can change the perceived identity of the chord and recontextualize its notes. In Figure 2, B \flat maj7 is a reverse extension of Dm, and the new added B \flat becomes the root, while the D that was the root in the first chord becomes a 3rd, and so on.



Figure 2: Dm chord becomes a B \flat maj7 by reverse extension.

As I mentioned earlier, this invites a kind of "double-function hearing": one can hear Dm continuing through the measure, with B \flat as a divorced, independent bass note; or, one can hear a new B \flat chord, with the root of Dm becoming a 3rd. This double-function hearing resembles Drew Nobile's "double-tonic complex," a hybrid of a major key and its relative minor (for example, C major and A minor) which unites the two tonic triads of those keys into a single tonic seventh chord (Am7). To paraphrase Nobile (2020, 207), a reverse extension exhibits neither one single chord identity nor competition among multiple chord identities. The biggest difference is that for Nobile (*ibid.*, 207), the combined tonic chord Am7 is the center of a polytonal system which is neither the key of A minor, nor the key of C major, but a "more abstract tonality encompassing them both." A reverse extension can happen in any tonality, and it need not be a tonic chord.

This harmonic relationship has been observed previously by Steven Strunk (1979) and elaborated by Keith Waters (2016), but by defining it as a "reverse extension" I am simplifying their concepts and highlighting the phenomenon of double-function hearing. Following Strunk, Waters describes the relative major/minor relationship as an "inclusion relation"; in mathematical terms, when a minor seventh chord such as C \sharp m7 is considered as a set of notes (C \sharp E G \sharp B), it "includes" its relative major triad,

E (E G# B). He then describes how C#m can often be substituted for E, and vice versa, since these two triads are so similar (Waters 2016, 41). My conception of reverse extensions identifies the same similarities and substitutions, but I go further by describing how this inclusion relation can lead to a double function hearing in which the C#m7 chord might sometimes be heard as an E chord with C# added beneath.

Example 2 shows a longer excerpt of “Be Without You” that includes a “double reverse extension” in the third measure. Here the song repeats the chords from the first two bars, but the bass changes to G instead of Bb. The resulting Gm9 chord is a double reverse extension of Dm. Like a (single) reverse extension, the double reverse extension has some ambiguity of root and identity; the Gm9 seems to retain the Dm chord, but the new bass note can be heard to recontextualize the notes of Dm as upper extensions of Gm. Dm/Bb has all the same notes as Bbmaj7, so I have written (= Bbmaj7) below the Dm/Bb chord symbol; but Dm/G is missing the Bb that is in Gm9, so I have used the approximate-equality symbol (\cong Gm9) to show that these chords are not exactly identical. Subsequent examples also use these two symbols.

One could even describe a “triple reverse extension,” such as the C/D chord (\cong Dm11) in Example 6 below. Some readers may be skeptical of hearing C/D as a single integrated harmony; but except for the minor 7th scale degree implied by the surrounding mode, this is nearly equivalent to what Mark Spicer calls the “rock dominant” (2008, 39) or the “soul dominant” (2017, 3), a IV chord with Sol in the bass, which Spicer and other scholars have observed is often labelled as V11 (for example, Temperley 2011, 3.10). The idea of hearing a triple reverse extension as a single integrated harmony seems to be uncontroversial in the case of IV/Sol, but other chords (or even more remote reverse extensions) may need to be justified with further emic support.

Reverse extensions in “Be Without You” appear as motions between adjacent chords, but a reverse extension can also be an abstract relationship between two non-adjacent chords. We can say that Bbmaj7 is a reverse extension of Dm, and Gm9 is a reverse extension of Bbmaj7 and a double reverse extension of Dm, even if these chords occur separately, especially if these chords occupy the same spot in a repeating chord progression.

Dm
Dm/B♭
(= B♭maj7)
C

Voice

I wan-na be with you, got-ta be with you, need to be with you. Oh, Oh,

Piano

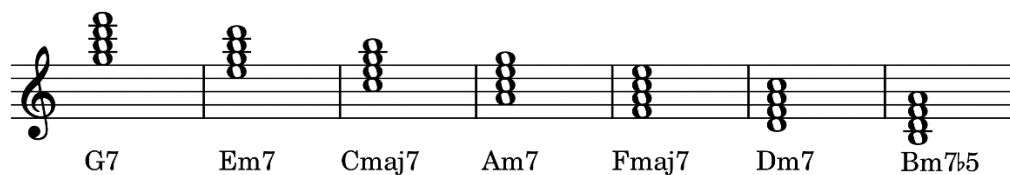
3 Dm
Dm/G
(= Gm9)
C
A7

Vo.

I wan-na be with you, got-ta be with you, need to be with you. Oh, Oh,

Pno.

Example 2: A longer excerpt from “Be Without You” (see Example 1).



A few higher extensions and hybrid / slash chords:

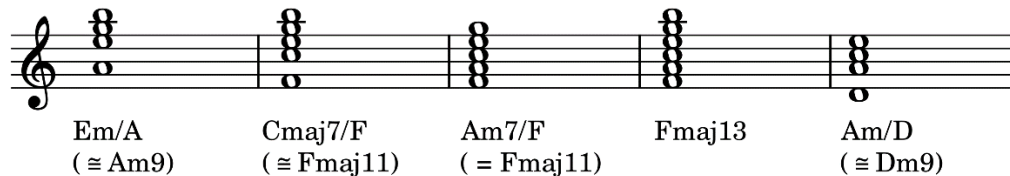


Figure 3: Extension-related family of chords in the key of C major.



Figure 4: Example 11 from Waters (2016) showing related chords on a chromatic cycle of alternating major/minor thirds. Reproduced with the permission of the author.

Figure 5 shows a musical score and a chord diagram. The score is in C minor (one flat) and 4/4 time. It features four chords: 1. Fm¹³, 2. A^bM⁹(#11), 3. Cm¹¹, and 4. D^bM¹³(#11). The chords are connected by intervals: [+1, -1] between 1 and 2, [+1, 0] between 2 and 3, [-3, +1] between 3 and 4, and [+1, 0] between 4 and the next implied chord. The diagram below the score shows the root motion (D^b, F, A^b, C, E^b, G, B^b, D, F) and melodic motion (Cm: ¹¹M, ^vM, iv, VI, i) for the first four chords. The diagram also shows the melodic motion for the first four chords: 1 (F), 2 (A^b), 3 (C), and 4 (D^b).

Example 3

Robert Glasper, "No Worries" (2009c), mm. 1–4 (00:45–00:55).

Figure 5: Example 3 from Baker (2019), which shows several adjacent chords and their extensions, built on a chromatic cycle of alternating major/minor thirds. Reproduced with the permission of the author.

Considered as chord relationships, extension and reverse extension appear to be near opposites.⁵ These two relationships can generate an “extension-related family of chords,” which are all related to each other by extensions or reverse extensions. Figure 3 shows the extension-related family in the key of C major. Some of these chords share many notes, and in some contexts they can substitute for each other, or be used in sequence to create some special effects, but these chords are not all equally interchangeable. While extension-related chords often share a lot of notes, the whole family includes chords that are more remote and usually dissimilar in function, such as Cmaj7 and Bm7b5.

Waters (2016) also describes how third-relations can generate a family of chords, but Waters’s framework is designed for a chromatic context in postbop jazz, while the Drake songs I analyze are grounded in a single diatonic scale. Waters describes a “ladder of thirds” generated by strict alternation between major and minor thirds, shown in Figure 4 which is reproduced from his article. Using terminology from Richard Cohn’s 2012 study of chromatic harmony in nineteenth-century classical music, Waters (2016, 38, footnote 7) describes this chain of thirds as “dual interval cycle” consisting of “ic3 and ic4” or “ic3/4” (see Cohn 2012, 186–189). Figure 4 shows how chromatic this cycle is, traversing DM, D#m, D^bM, and Dm chords. This terminology is useful for “an environment that does not support an unequivocal global or local tonic” (Waters 2016, 54), such as the chromatic compositions of Chick Corea which Waters analyzes. However, many contemporary R&B and hip-hop songs

stay mostly within a single diatonic scale, so for simplicity's sake I have defined reverse extensions and extension-related families in diatonic rather than chromatic terms.

More chromatic methods are not irrelevant to contemporary R&B, but have been used to analyze neo-Soul, especially by Ben Baker in an article about the jazz/neo-Soul pianist Robert Glasper. Baker describes a 4-bar loop consisting of third-related chords, showing how these triads and their extensions all overlap on the same $ic3/4$ cycle (reproduced here as Figure 5). Baker tackles this chromaticism by adding neo-Riemannian terminology and notation to Waters's methods. Richard Desinord (2021, 53:30) confirms that motion in thirds is common in neo-Soul more broadly, and observes that highly chromatic chord extensions are characteristic of that style: "[...] you don't want to always sound like everything is diatonic [...] in a lot of neo-Soul you start to hear these chords with those upper extensions being used that stray far outside the key." But Drake's music, like I said, is often strictly diatonic. I can thus use simpler notation and terms, focusing my discussion on the phenomenon of plural chord identity or multilayeredness, rather than chromatic syntax.

Reverse Extensions as Chord Substitutions in Loop-Based Songs

Extension-related chords usually share several notes, and they can thus often be easily substituted for one another within a progression, as suggested by Strunk (1979) and Waters (2016). An analogous idiom from classical music theory is the deceptive cadence, which could be thought of as a tonic chord being replaced by its reverse extension, the submediant vi chord. The effect of a reverse-extension chord substitution can be created in songs that have a fixed chord loop, although technically no actual "substitution" occurs if the original loop's notes all remain present. An added bass part can recontextualize chords in the loop, creating the effect of a chord substitution even though the original loop remains unchanged. De Clercq (2019, 279) calls this situation a "loop divorce" because while the original loop remains unchanged, the bass (which usually contrasts with the loop's timbre and register) moves in a new way, which seems to encourage listeners to hear the bass as moving independently from the loop. But if the bass chooses notes which are reverse extensions of the loop's original harmonies, the resulting sonority can often also be heard as a single integrated chord.

The reverse extension relationship between the harmony layer and the bass thus serves as a way to quantify the "relatedness" which de Clercq suggests remains within a bass-harmonic divorce, but this relatedness also complicates the concept of divorce. In reverse extensions, the ease with which a bass and harmony can be heard as an integrated chord quantifies a sense of relatedness (in an integrated hearing, the bass has conventional intra-chord relationships with the notes in the harmony layer). But

arguably, when a reverse extension can be heard as an integrated harmony, this provides grounds for hearing this harmony as no divorce at all.

Example 3: Opening loop (0:00–0:12) from Drake’s “God’s Plan.” 2018. (Transcribed by the author.)

Example 4: Verse 1 (0:24–0:37) from “God’s Plan,” bass line added to original loop.

For example, Drake's song "God's Plan" (2018) begins with a two-measure loop composed by Drake's collaborator Ronald "Cardo" LaTour, shown in Example 3, which continues throughout the song. I have labelled the second chord as ii in the key of A minor, and I hear the loop as an oscillation between the i and ii harmonies. Several people have told me they hear this loop (and the whole song) in G major; and I can see how the main vocal phrase's descent to G in Example 4 might seem to encourage this hearing, since traditionally, melodies often end on a note from the tonic triad. But melodies in contemporary pop music do not have to end on a tonic, and some commentators (Huang 2020, Hisato 2021) have singled out scale degree 2 emphasis as a trend in recent pop music, which seems to match this phrase's emphasis on B when heard in the key of A minor. I find the G major hearing ultimately becomes untenable (to my ears, at least) when the bass line features a clear E → A motion at the end of Example 4, which I struggle to hear as anything but a Sol → Do or V → I motion. However, this bass line's influence is only as strong as the bass response of your speakers, a factor influencing the availability of plural listening experiences which I will return to later.

The identity of the second chord in Example 3 is ambiguous, because the lowest note briefly changes from B to G, making it momentarily more like Bm7/G or Gmaj9. One reader told me that they hear this chord as Gmaj9 immediately, before the G note even sounds. A Gmaj9 chord would be a bVII in the key of A minor, but since this hearing is indicated by only a single G on beat 3, I have marked it with parentheses (bVII) to indicate how tentatively I hear it.

At 0:24, after the loop repeats a few times by itself, Verse 1 begins with an added bass which sometimes reinforces the original loop's harmonies, but sometimes recontextualizes them, as shown in Example 4. In measure 2, the bass's B supersedes the motion to G in the original loop, strengthening the Bm7 hearing and (to my ears, at least) dispelling the Gmaj9 hearing. But then in measure 4, this clarified chord function is recontextualized with a new G in the bass, creating a clear Gmaj9 that is a reverse extension of Bm7. Then at the end of the measure, the bass moves to an E, creating a double-reverse extension (Em11) and providing stronger motion back to the tonic than the original loop.

To summarize, an artist who is working with a fixed loop can either maintain the harmonies in the loop or add new bass notes to create the effect of changing to other extension-related chords. Since the original loop does not change, it is possible to continue hearing the original chords as a continuing layer separate from the new bass. Because of this, in measure 4 of Example 4 I have put the original chord function in square brackets.

Bb6 add4
(or Gm7 add6/Bb) C Gm7 add6

Gm: i^6 or III IV i

Example 5: Harmony loop without bass line (3:06–3:28) from Drake’s “Fancy.” 2010. (Transcribed by the author.)

Bb6 add4
(\cong Gm7/Bb) C/D
(\cong Dm11) Gm7 add6

Gm: i^6 or III v i

Bb6 add4
(\cong Gm7/Bb) C Gm7 add6 Gm7/D
(\cong Dm13?)

Gm: i^6 or III IV i v

Example 6: Harmony loop with bass line (3:28–3:50) from “Fancy.”

One criticism I received at a conference presentation of this work was that perhaps Drake was more focused on the words, drums, and timbres, and was not thinking of anything like the reverse extension relationships; perhaps Drake just added a familiar bass line figure without thinking of how it matched the chords in the original loop. It’s certainly possible that nobody working on the song was thinking of the added bass as anything like a reverse extension of the existing harmonies, but as a bass moving independently of the harmonic layer. However, even if none of the artists involved were thinking in comparable terms, reverse extensions still explain why this bass line sounds compatible with the original loop, even though some of the bass line’s notes are not part of the loop’s chords. Reverse extensions provide criteria for a sense of relatedness, a way of hearing these notes as part of the same harmony. Additionally, the concept of a reverse extension shows how we could write similar harmonic

progressions ourselves which create the same ambiguous or plural effects, regardless of how Drake or his collaborators may have thought of them.

Drake's song "Fancy" (2010) shows similar harmonic phenomena with a greater transformation of the original loop. The loop shown in Example 5 runs through the whole song; it starts with either *i*, *bIII*, or *vi°*, depending on how you hear the root, which is then followed by *IV* and a return to *i*. But at many places in the song, there is a bass line added to this fixed loop, forming an 8-measure phrase shown in Example 6. This new bass line recontextualizes the *C* chord in measure 2 with an added *D* in the bass creating a *C/D* that is aurally similar to a *Dm11* (in other words, a dominant chord instead of a subdominant). The same bass note is used under the last chord, creating a *Gm7/D* that resembles *Dm13*. This new phrase-ending dominant chord creates more momentum for the phrase to repeat than the original loop's tonic.

As I mentioned earlier, reverse extensions are especially useful for understanding how harmony can work in a modern creative environment. In today's music studios, individual parts are often synthesized or recorded by different people in different sessions far apart in space and time, and there may not be a single artist masterminding the whole composition and production process. Many contemporary R&B and hip-hop songs include samples from older recordings, creating fixed layers that songwriters cannot directly change. Extensions and reverse extensions identify options for how a songwriter can use newly composed layers (especially bass lines) to alter those existing harmonies and create additional motion.

These two songs also highlight another departure from how third-related chord substitutions have previously been theorized. Strunk describes "substitution sets" in tonal jazz, which like my extension-related families describe groups of interchangeable third-related chords. However, Strunk's (1979, 15) substitution sets are constrained by classical categories of harmonic function. For example, *IV* and *ii7* are both traditionally considered subdominant harmonies, so they may be substituted for one another; but *vii°7*, which "includes" *ii*, cannot be substituted for *ii* since *vii°7* is traditionally considered a dominant harmony. In "God's Plan" (Example 4), however, reverse extensions of *ii* create the effect of substituting with *bVII* and *v*. "Fancy" (Example 6) transgresses classical harmonic function categories even further: the *IV* in the upper voices of measure 2 can be heard to take on the function of *v* with the bass added in that measure, while in the final measure the *Gm7add6* which originally had a clear tonic identity is given a new bass that affords a hearing of *v*. In summary, reverse-extension substitutions in Drake's music do not always remain within traditional chord function categories. (Some scholars maintain traditional chord function categories in pop music; see Biamonte 2010, Lilja 2009. But this has been challenged by others; see Nobile 2016, Doll 2017.)

The image shows a musical staff in 4/4 time with a key signature of three sharps (F#, C#, G#). The chords and their relationships are as follows:

- Emaj7 (E4, G#4, B4, D5) → C#m9 (C#3, E3, G#3, B3, D4, F#4) via Reverse Extension.
- C#m9 → D#m7 (D#3, F#3, A3, C#4) via a red double-vertical line.
- D#m7 → F#/G# (≅ G#m11) (F#3, A3, C#4, E4) via Double Reverse Extension.
- F#/G# → E (E3, G#3, B3, D4) via Reverse Extension.

Example 7: Opening harmonic loop (0:00–0:35) in Drake’s “Passionfruit.” 2017. (Transcribed by the author.)

Motion Between Extension-Related Chords

When extension-related chords are used in direct succession, they often create feelings of simultaneous motion and stasis, because while the root of the chord changes, many notes stay the same. This was true in my very first example, the opening to Mary J. Blige’s “Be Without You.” After the song began with a Dm chord, the reverse extension to Bbmaj7 evoked a feeling of stasis since the upper voices remained the same, but also evoked a feeling of motion since the bass moved down to a Bb.

Drake’s song “Passionfruit” (2017) exploits extension-related motion to more extreme ends. In the loop that runs throughout the song, shown in Example 7, virtually the entire progression is made up of reverse extensions and double reverse extensions. The opening chord Emaj7 is followed by a reverse extension to C#m9. The third chord of D#m7 is followed by F#/G#, which approximates G#m11 (a double reverse extension of D#m7). This G#m11 is then followed by another reverse extension to an E chord. The only place where I hear unambiguous harmonic progression is between the C#m9 and the D#m7, marked with a red double-vertical-line in Example 7. All these reverse extensions create a paradoxical feeling of constant descending bass motion combined with harmonic stasis.

Another feature of this chord loop which further undermines any sense of motion or progression is that after establishing a two-measure harmonic rhythm, at the end of the loop the E harmony arrives “early” after only a single measure of G#m11. Normally there would be some feeling of arrival each time the loop begins again, but here, the early arrival of the loop’s initial harmony sublimates even this marker of progression. Additionally, some of the chords have upper extensions that jazz theory would label as “tensions”—but because of the reverse extensions, these tensions do not seem to really go anywhere, they just persist, waxing and waning without ever resolving.

This song’s lyrics reflect the chords’ ambiguity and unresolved tension, as Drake struggles to deal with continued passion in a relationship that is ending. The chords’ paradox of simultaneous motion and stasis reflects Drake’s new emotional brand of

tough masculinity. Jasmine E. Johnson (2018) writes that “Drake has become synonymous with being in feelings. His music consistently and unambiguously speaks to the fact that he cares, feels, and emotes,” and Ismail Muhammad (2021) writes that “Drake reflected back to my generation the scattershot and confused nature of our romantic pursuits in the era of dating apps and social media.” The frequent use of mostly minor chords, vacillating root motion, unresolved tensions, and stasis caused by reverse extensions underlines even Drake’s most aggressive and confident lyrics with notes of unease, self-doubt, and regret.

But, as Spencer Kornhaber argues in a review of Drake’s 2021 album *Certified Lover Boy*, Drake never leaves behind his pickup artist persona. He expresses a desire to be caring in his relationships, but also sings lines that are plainly uncaring and hurtful to women. Drake himself describes *Certified Lover Boy* on Apple Play as “a combination of toxic masculinity and acceptance of truth which is inevitably heartbreaking,” which could sound like an admission of guilt or even an apology, except that he expresses no apparent intention to change. Gail Bederman (1995, 7) theorizes masculinity as a “historical, ideological process,” and it could be argued that Drake presents a twenty-first-century twist on earlier constructions of misogynistic masculinity, incorporating moments of emotional vulnerability and posing in self-critique without actually swearing off toxic behavior.

Multilayered Harmonies and Intra- and Inter-textual Memory

Drake’s song “Teenage Fever” (2017) shows how intratextual memory and intertextual references can add to the multi-layered, plural hearings of reverse extension chords discussed above. One loop runs throughout the whole song: a series of four rolled chords on a highly processed electric piano synth, shown in Example 8. I hear three of these chords as minor tonics, and the last one as a \flat VII. (A reader pointed out to me that a faint bass frequency with a different timbre can be heard underneath the first chord, and I will discuss this soon.) Throughout the song, one’s memory of this simple harmonic motion is then layered, first with an added bass and then with a lyric sampled from Jennifer Lopez’s 1999 hit, “If You Had My Love.”

The musical notation shows a four-measure loop in 4/4 time. The key signature has three sharps (F#, C#, G#). The melody in the treble clef consists of the following notes: $\text{G}\sharp_4$ (quarter), $\text{A}\sharp_4$ (quarter), $\text{B}\sharp_4$ (quarter), $\text{C}\sharp_5$ (quarter), $\text{B}\sharp_4$ (quarter), $\text{A}\sharp_4$ (quarter), $\text{G}\sharp_4$ (quarter), $\text{F}\sharp_4$ (quarter), $\text{G}\sharp_4$ (quarter), $\text{A}\sharp_4$ (quarter), $\text{B}\sharp_4$ (quarter), $\text{C}\sharp_5$ (quarter), $\text{B}\sharp_4$ (quarter), $\text{A}\sharp_4$ (quarter), $\text{G}\sharp_4$ (quarter), $\text{F}\sharp_4$ (quarter). The bass line consists of four chords: $\text{G}\sharp_2$ (quarter), $\text{G}\sharp_2$ (quarter), $\text{G}\sharp_2$ (quarter), $\text{G}\sharp_2$ (quarter). The chords are labeled as $\text{g}\sharp\text{m}: \text{i}$ and $\flat\text{VII}$.

Example 8: Opening loop (0:00–0:19) from Drake’s “Teenage Fever.” 2017. (Transcribed by the author.)

Musical notation for the first line of the chorus. The key signature is one sharp (F#) and the time signature is 4/4. The melody consists of quarter notes and half notes. The lyrics are: "If you had my love and I gave you all my trust would you com - fort me? And if". The guitar chords are: Bm (measures 1-2), Bm (measures 3-4), Em (measure 5), and F#m (measure 6). Below the staff, the chord progressions are labeled as Bm: i, i, iv, v.

Musical notation for the second line of the chorus. The key signature is one sharp (F#) and the time signature is 4/4. The melody continues with quarter notes and half notes. The lyrics are: "some - how you knew that your love would be un - true would you lie to me? And call me ba-by". The guitar chords are: Bm (measures 7-8), Bm (measures 9-10), Em (measure 11), and F#m (measure 12). Below the staff, the chord progressions are labeled as Bm: i, i, iv, v.

Example 9: Chorus (0:20–0:39) from Jennifer Lopez’s “If You Had My Love.” 1999. (Transcribed by the author.)

Example 10: Chorus (0:59–1:37) from “Teenage Fever.” (Transcribed by the author.)

Lopez’s song depicts a character who is cautiously inviting another person to commit to a mutually caring romantic relationship. Lopez’s chorus, shown in Example 9, features a i–i–iv–v four-measure harmonic loop. Lopez’s questions in this chorus, such as “And if you somehow knew / that your love would be untrue / would you lie to me?,” sound cautiously hopeful, as if the singer expects a reassuring answer confirming that the love is mutual.

These chorus lyrics take on a completely different meaning in Drake’s song, in which the protagonist weighs his faltering current relationship against the possibility

of entangling with a woman he becomes infatuated with at a party. In this context, Jennifer Lopez's questions no longer read as earnest and hopeful, but distrustful and disillusioned; Drake's verse lyrics, which swing between current frustrations and imagined infidelities, imply that the answer to "Would you lie to me?" is probably "Yes." It's no coincidence that the only part of Lopez's chorus that Drake leaves out is the incorruptibly earnest line, "And [would you] call me baby?"

Drake's chorus harmonies recontextualize Lopez's melody to reinforce the alienation implied by his lyrics. Drake pitches the sample down to the key of G# minor and removes the original instrumentals, adding in his own harmonies and bass. In the third measure of each 4-bar phrase, the melody taken from Lopez's original song still outlines the iv chord, but Drake never uses a iv harmony, instead using i or bVI so that the final melodic note C# is left hanging, as an unanchored, unresolved non-chord tone. As a result, this melody made for another harmonic context fits well at first, but on the final note of each phrase it suddenly feels disconnected and out of place.

In addition to this intertextual dissonance, an intratextual memory of Drake's opening chord loop adds to this sensation of dissociation. The only motion of the original chord loop is to briefly depart from the tonic and return to it; but in Drake's chorus, this return is thwarted by the bass every time, recontextualizing the expected tonic as a reverse extension to bVI or iv, pulling the rug out from under this memory of the tonic return so that it becomes a new (or continued) departure instead.

This sense of dissociation is amplified by the feelings of simultaneous stasis and motion created by reverse extensions. The bass vacillates between G#, E, and C#, implying motion between extension-related chords that is in a sense also not-motion, since the chords of the original loop remain exactly the same. This creates a feeling of dissociation between the chord loop and the bass, drawing on the double-function effect of reverse extension chords that I described above; the chords with E in the bass are in one sense Emaj7 chords, but in another sense they can be heard as G#m chords with a disconnected bass, and similar double- (or even triple-) hearings occur when the bass moves to C#. This dissociation is made even stronger when the bass stays static during the fourth measure in each line, as the looped chord progression temporarily moves to F#. "Out of body," Drake sings in Verse 2, "This shit feels like a teenage fever."

Another layer of plurality is created by the listening situation. Hearing this song through a wall, or standing outside someone else's car, one might hear only the bass. Listening on laptop speakers, cheap headphones, or a shower radio, one might hear only the melody and midrange chords. In other words, different listening conditions can highlight some pitch strata and mask others. Encountering a song in a new situation can cause one to literally revise one's hearing, incorporating a previously

inaudible bass line or synth pad that had escaped earlier notice. I especially felt this in “God’s Plan,” whose bass line is nearly inaudible on some laptop speakers but blooms on a larger stereo. None of these different hearings are “wrong,” and in fact they may be intended, as many record companies go to great lengths to make sure their releases sound attractive across a range of playback conditions; a double-function analysis of a reverse extension accommodates them all by enumerating the multiple chord identities afforded by these sonorities. These differences in hearing caused by material conditions are neither tangential nor merely incidental, but point to fundamental truths about the open-ended and plural nature of hearing that reverse extensions foreground, as I discuss in this article’s conclusion.

The original loop of “Teenage Fever” has a faint bass frequency which complicates this picture even further. Underneath the original G#m tonic chord, a faint E can be heard in a different timbre. This E is so faint, I never noticed it until a reader pointed it out during my revision process. This frequency’s faintness and timbral difference from the harmonic layer suggest it may be a distortion artifact: this E would be the difference tone between the G# and B in the electronic piano part, and distortion has been known to make difference tones audible as “distortion fundamentals” in other situations, such as guitar power chords in metal music (Lilja 2009, 134). But this frequency may also be a palimpsest of an earlier bass line in some earlier incarnation of this loop, which has been mixed down but remains barely audible when the loop is presented by itself. Now that the E has been brought to my attention, I find it is audible, and I can choose to hear it as a chord tone; but I can also choose to focus on my original hearing of this chord as a G#m tonic, and hear the low E frequency as inharmonic noise. (And, of course, on laptop speakers I still find the low E to be completely inaudible.)

Plurality, Indeterminacy, and Enactive Music Theory

The biggest difference between analyzing these passages in Drake’s music as “bass-harmonic divorces” and “reverse extensions” is that a reverse extension is a harmony which, by definition, affords plural hearings. I’d like to explore the stakes and consequences of this difference by aligning reverse extensions with a cognitive perspective called “enactivism.” Enactivism is a school of cognitive science (grounded in the phenomenological theories of Maurice Merleau-Ponty) which views cognition as the enaction of familiar patterns. A sounding chord is not “a tonic C major chord” until an individual listener enacts their understanding of the categories “C major” and “tonic” while listening. Mariusz Kozak’s recent book *Enacting Musical Time* (2020) synthesizes a broad and multifaceted enactivist theory of musical time (which is also a theory of musical experience, cognition, and knowledge). In a forthcoming review

of Kozak’s book (Hudson 2023), I identify a growing trend of “enactive music theory” which, although it does not always explicitly participate in enactivism, resonates with enactivist perspectives by framing musical structure as something created by subjective individuals, rather than something objective “in the music itself.” Chris Doll’s book *Hearing Harmony* (2017) provides an account of harmony that could be described as “enactive,” in which chord functions (and schemas, identities, roots, and more) are described as subjective effects rather than objective properties. As Doll (2017, 218) recognizes, this makes a chord’s identity and root inherently plural, since different listeners (or the same listener in different moments) might hear the same chord to have different roots or identities.

To understand the consequences of this enactive approach, consider de Clercq’s analysis of Bruce Hornsby’s song “Every Little Kiss.” De Clercq (2019, 277) argues that a particular chord represents a harmonic divorce, with a tonic I chord in the harmonic layer and Fa in the bass; and, “[...] had we not been presented with an authorized transcription, we may have missed the harmonic-bass divorce entirely, simply presuming that the chord prior to the half cadence was just a IVM9 sonority.” This passage frames the songwriter’s written chord symbol as the “correct” analysis—that is, de Clercq frames his original hearing as a mis-hearing. But from an enactive perspective, both hearings are valid, and in fact, the possibility of plural hearings helps describe perceptual effects of double function or multi-layered-ness which are hard to accommodate in a theory which reduces this plurality to a single authoritative chord symbol.

Nobile (2020, 207) describes a more plural sense of chord identity when he defines the double-tonic complex as “neither one single key nor competition among multiple keys,” which resonates with the perceptual plurality of reverse extensions. Nobile explains further that the double nature of the double-tonic complex is not mere “ambiguity.”

Tonal *ambiguity* means conflict, competition, or confusion. [...] Here, Doll’s description of tonal ambiguity as “facing two different directions at once” or “flickering” between two incompatible interpretations is apt. What I have proposed in this article is the possibility of a tonal situation more akin to linguistic *indeterminacy* [...] As I hope to have shown, two relative keys in the rock idiom can be so intertwined so as to blend together, their differences reduced to small details that fade from our mental focus. (Nobile 2020, 222–223)

The harmonic effect of an extension-related substitution created by reverse extension is in between ambiguity and indeterminacy, but closer to indeterminacy. When the bass hits C# in Figure 10, we can hear two or three clear possible interpretations: the tonic identity of the G#m chord which persists in the original harmonic loop, or the iv identity of a C#m9 chord implied by the bass, or even a

palimpsest or memory of the Emaj7 identity implied elsewhere in the chorus (after all, C#m9 is a reverse extension of Emaj7). The differences between these hearings are not merely (to use Nobile's words) "small details that fade from our mental focus," but on the other hand, these different hearings are compatible, they do not conflict or cancel each other out.

But without an enactive perspective, such as Doll's theory that chord identity is a subjective effect, descriptions of a chord having a plural identity often read like purple paradoxes or esoteric mysticisms. For example, consider Nobile's analysis of Daryl Hall and John Oates's song "Private Eyes."

The sections' similarities suggest two things: (1) C–E–G in the piano's right hand represents a C-major triad, not the third, fifth, and seventh of an Am7 chord, even when the bass is on A; and (2) the verses' C-major triads are *incomplete* versions of a four-note tonic sonority, the full version of which is stated in [the chorus]. (Nobile 2020, 212)

If read as an objective description, this seems awfully baroque and contrary: C major with A in the bass is not Am7, but C major by itself is an incomplete version of Am7. But if triad identity is not an objective quality but a subjective "root effect" and "identity effect" as Doll says, the difficulty and self-contradiction of this description vanishes. Listeners can hear C major with A in the bass as still a C major chord—or they can also hear it as Am7—there's nothing essentially "not-Am7" about it; and listeners can still hear a memory of Am7 invoked or referenced by just the C major triad on its own, or they can hear it as "just" a C major triad, too. Nobile (2020, 213) says further, "I must admit that I find a monotonal reading in A minor to be perfectly valid, and I cannot entirely disagree with it." While someone listening to a double-tonic complex—and a reverse extension—can have conflicted, indeterminate, or multi-layered experiences, they do not have to; these harmonies afford simple hearings, too.

Doll's description of a "hearing" quite vividly evokes the plural and multi-layered experiences that can be described within an enactive approach, a reality which seem harder to account for within a theory in which a particular chord progression either is, or is not, a bass-harmonic divorce.

Hearings are highly complex; residue of earlier ones seems to stick to newer ones, creating multilayered, subtly colored patchworks that might contain outright contradictions [...]. When we try to verbalize a "hearing," we are probably describing a kind of Frankenstein-like composite of pieces of distinct experiences from different moments in our lives. (Doll 2017, 82)

The different ways of hearing reverse extensions are not orthogonal interpretations that contradict each other, but parallel layers that accumulate in our understanding and experience. In "God's Plan," our hearing of the chorus harmonies at any one

moment is a composite of experiences: the sounds that we hear in the present are layered with our memories of the original version of the loop, of added or shifting bass notes, of the same sounds from previous listening sessions, of different experiences of those sounds in different listening situations, and possibly even memories of the original harmonies from Jennifer Lopez's song.

This enactive perspective also helps explain a kind of listener's agency that I have implied throughout this article. In enactive music theories, since cognition is the enacting of familiar patterns, a listener simultaneously both actively construes a particular musical structure and also experiences the music according to that structure. If a chord's identity is a subjective effect, a familiar pattern enacted by me as a listener, then when a chord affords multiple identities I have some agency to enact different harmonic experiences. This agency in listening to a reverse extension is, in a way, the dual or twin of the producer's agency to create a reverse extension in the first place (by adding a new bass line below an existing harmonic loop). Jazz theory—which understands even the most basic chord identities less as analyses of fixed objects, than as possibilities for addition and improvisation—provides a framework in which the plurality of reverse extensions, and the agency that reverse extension relationships afford producers and their listeners, fit right in as natural properties of harmony. Reverse extensions and the multi-layered experiences they seem to invite are perhaps not so exotic, but (like double-tonic complexes) reveal mechanisms of plurality and indeterminacy that are inherent to popular music harmony.

Notes

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¹ Reverse extensions superficially resemble historical theories which explore adding a third below the root, especially Jean-Phillipe Rameau's theory of "supposition" (see Kassler 2001) and Hugo Riemann's dualist conception of "generation downwards" (see Cohn 2012, 139–144). These theories, however, carry with them many assumptions and rules (especially about consonance, dissonance, and voice-leading) that do not apply to contemporary popular music.

² For more on personas, see Moore (2012, chapter 7), Hatten (2018), and Palfy (2021).

³ In this article, I use "third" and "seventh" to refer to intervals or chord-types, and "3rd" or "7th" to refer to specific notes that make up a chord.

⁴ Berkman does not use terms like "polychord" or "hybrid voicing," but he does discuss this type of slash chord at length (2013, 128–135).

⁵ Extensions and reverse extensions are not exact inverses: an extension of C to Cmaj7, followed by a reverse extension of Cmaj7 to Am9, does not produce the original chord, C. The inverse of a reverse extension is a transformation which removes the original root.

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