"Guitar thinking" and "Genre thinking" among an Online Community of Guitarists

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Abstract

Researchers and performers of popular music have long intuited that popular music's organizational features are linked to the physical-tonal properties of the electric guitar. But despite emerging research, Doll's (2018) criticism still stands: current evidence is either too broad or too specific to support generalizations about how fretboard affordances shaped popular music's development. Popular-music corpus studies offer remarkable explanatory power in clarifying stylistic trends and paradigms, but research thus far has focused on structural and perceptual aspects of the music rather than kinaesthetic ones that address aspects of guitar performance. In this article I employ statistical methods of corpus analysis to explore how popular-music guitarists engage in 'guitar thinking' (De Souza 2021) and 'genre thinking' (Johnson 2018)—that is, I use a database generated by an online community of guitarists to capture basic paradigms on how guitarists move about the fretboard, and then explore how those movements might clarify how these guitarists conceptualize genre through these physical gestures.

KEYWORDS: guitar, fretboard, genre, music theory, music cognition

Introduction

Guitarists active on the *ultimate-guitar.com* forums are constantly looking for ways to leverage the physical-acoustic characteristics of their instruments to achieve a specific effect. *Affordances*—or how the environment, in this case the fretboard, might permit or even suggest certain pathing—are at the heart of nearly any post that directly addresses physical performance.[1] For instance, in a recent presentation Chiu (2023) describes how *ultimate-guitar.com* guitarists suggest manipulating tuning to imitate "twinkly emo" music as popularized by bands such as American Football, and how these tunings are associated with easier physical gestures. This mirrors work by Kaminsky and Lyons (2020) on Joni Mitchell's song catalogue. Mitchell, who lost full mobility in her left hand due to polio, also tunes her guitar in different ways to make it easier to navigate the fretboard.

Outside of physicality, genre is another hotly debated topic amongst forum users, with long threads devoted to discussing how bands do or do not align with umbrella styles such as rock, metal, folk, or pop. Many of the discussions delve deep into specific subgenres. In a forum titled "Favorite Metal Genre," user loganochs asks guitarists to respond with their favourite metal genre, best metal genre, and worst metal genre.[2] Responses showcase the sheer depth of genre conceptions within the second-most popular tab genre on *ultimate-guitar.com*. Black metal, sludge metal, doom metal, heavy metal, thrash metal, black/goth metal, and more are all up for discussion.

In this article, I begin to connect these two areas, physical fretboard gestures and genre conception, by studying the performance practices of amateur and semi-professional guitarists. My focus on physicality and fretboard space aligns strongly with what De Souza (2021) describes as *guitar thinking*—how interfacing with an instrument "coordinates body, ear, and mind" (1) to uncover a sort of underlying logic in musical styles. And noting De Souza's emphasis that "style matters" (19), I turn to Johnson's model of *genre thinking* as a window into how genre potentially informs fretboard practices. Here, I specifically parse community submissions to *ultimate-guitar.com* to codify trends that illuminate "the possible ways that genres are experienced, structured, and understood at a certain time for large cultural communities" (Johnson 2018: 44–45). *Ultimate-guitar.com* users are one such large community, meaning a corpus study of their contributions to this community potentially reveals how guitarists more broadly conceptualize and understand differences in musical genre through physical gesture.

Guitar Performance Studies

Music researchers have long intuited that guitar performance shapes popular music's stylistic features. Frequently these intuitions surface when discussing other parameters. Regarding harmony, de Clercq and Temperley (2011) point toward an often-observed pentatonic collection in the Rolling Stone 200 (*RS200)* rock corpus and remark that "open chord voicings [on guitar] may be preferred harmonic choices irrespective of the tonic of a particular song" (de Clercq and Temperley 2011: 67). Cook (1990: 100–101) meanwhile suggests that the texture of pop music is "essentially homophonic" due to the division of labour between the left

hand (pitch) and right hand (rhythm). Biamonte (2010) similarly links guitar timbres to texture and chord voicing when discussing overdrive (i.e., distortion); she notes that, when an audio signal is overloaded, an audible dissonance is created between a chord's root and third, which may explain the preference for open fifths (i.e., "power chords") and an aversion to major thirds in rock guitar parts.

A handful of studies also focus explicitly on guitar performance in popular music. Koozin (2011) outlines how common chord shapes, such as barre chords, and their location on the fretboard can help delineate large-scale harmonic progressions and segment form in songs by The Kinks, Jimi Hendrix, and The Grateful Dead. Easley (2015) similarly demonstrates that American hardcore punk guitarists generate the style's harmonic and formal paradigms through variation and repetition of four types of two-part left-hand lateral gestures. A motion-capture study by Shea (2022) further clarifies the relationship between form and gesture, where practicing popular-music guitarists are shown to prefer to situate the largest lateral gestures at hypermetric and formal boundaries when improvising. Select analyses in De Souza (2018) also illustrate how fretboard fingering transformations and lateral gestures generalize across fretted instruments and styles. Each points toward a relationship between aspects of guitar performance, primarily fretboard navigation, and salient musical parameters such as chord voicing, harmony, or formal organization.[3]

Despite this growing foundation of research, it is still difficult to generalize beyond the above case studies about how guitar performance practice corresponds to—or perhaps even influences—popular music's stylistic components. Style analysis, as one piece of this puzzle, inevitably requires an objective survey of a historically expansive corpus of works to establish the *rules* of a specific genre (Meyer 1989). de Clercq and Temperley (2011) and Burgoyne, Wild and Fujinaga (2013) do precisely this through respective statistical analyses of the *RS200* and *McGill Billboard Hot 100* (MBB) popular-music databases. But while existing corpus-based methods clarify listener perspectives, particularly regarding pitch (de Clercq 2017; Temperley 2018; White and Quinn 2018), current popular-music corpora are not designed to address cross-modal aspects of performance.[4]

Guitarists are one of potentially many contributors responsible for creating a popular-music song. In genres like punk rock or metal, the guitarist's role is overt—a song's structural elements (e.g., harmony, form, rhythm) are directly linked to guitar performance, specifically because the guitar part contributes to much of the song's rhythmic, harmonic, and/or melodic content as one of the most prominent voices in the recording. This is true for songs like 'Hold On' by Alabama Shakes, where the guitar riff is likely the most accessible instrumental part for a listener. Conversely, there are many songs in which the guitar is not the most salient part but still signals changes in musical organization, such in "Now" by Paramore where a switch from a single-note riff to power chords signals the change from verse to chorus. Such nuanced gestural transformations may be less traditional indicators of organization but reflect how a guitarist might link the physical transition with a formal transition; in effect, how they engage in guitar thinking. Outside of any individual example, the power of corpus-based methods of analysis is the ability to see past performer differences to capture broader trends. This bird's-eye view allows us to explore such trends through tablature files compiled by a community of guitarists.

In the following section, I detail the development of this study's corpus, the *Guitar Pro Tablature* (GPT) corpus, as a vehicle for such an investigation. But before doing so, a few methodological issues need to be addressed: how to equitably develop a corpus that reflects a diversity of styles and artist identities, particularly to foreground the contributions of Black and other musicians of colour on the development of the style, and how corpus materials are gathered, encoded, and processed for analysis.

Methodological Considerations

The decision to develop a novel tablature corpus intersects with this study's goal to provide a moderate survey of guitar performance practice techniques in specific genres. Meeting this goal requires a historically expansive and stylistically diverse corpus, meaning selected songs should cast a wide chronological net across as many artists as possible. However, by pursuing breadth, a resulting corpus would simultaneously lack the stylistic depth to engage with the work of previous authors whose studies focus primarily on "classic rock" songs of the 1960s and 1970s. Given these considerations, a contemporary guitar-performance corpus needs to encompass multiple points along Meyer's (1989) continuum of style. That is, the corpus should engage with the compositional-performative *idioms* of individual guitarists, then situate these idioms within a *dialect* of similar guitarists who may or may not be associated with the same *genre* such as pop, rock, or classic rock.

These concerns frame why *GPT* is not generated from songs in the *RS200* and *MBB* corpora. As mentioned previously, these corpora are listener-oriented, meaning their materials reflect a listener's understanding of popular-music songs that are either commercially successful (*MBB*) or critically acclaimed (*RS200*). Because of this focus, some artists and eras are represented more frequently than others. For example, in the *RS200*, 8 artists make up approximately 25% of songs in the entire corpus. In the *MBB*, 26% of all songs are by 30 artists whose songs are featured 5 or more times. Both corpora also present minor obstacles related to historical distribution. The *RS200* (1949–2001) covers more ground than the *MBB* by a total of 20 years but most of its songs are concentrated in the 1960s and 70s ($n = 86$, 43%). Songs in the *MBB* (1958–1991) are more equally distributed across each decade but span fewer years than the *RS200*. Finally, with full acknowledgement that time eventually renders any corpus outdated, both corpora do not encompass songs written in the past 20 years, ca. 2000–2020.

An additional consideration in building a new corpus is the pressing issue of racial representation that has recently come into focus in the discipline of music theory. On the surface, popular music, and by extension popular-music theory research, seems to provide a fertile ground for addressing Ewell's (2020) call to dismantle the conception of music by white persons as the "pinnacle of music-theoretical thought" (2.4). Nevertheless, I argue a level of intentionality is required to address this critical issue in corpus-based work. Two components of Ewell's essay pertain to this study: the need to step away from theoretic methodologies that inherently marginalize persons of colour (POC) and, secondarily, to increase the representation of POC in music theory research.

To an extent, I believe this study's focus on physical gesture addresses Ewell's former concern. Specifically, by taking a process-based rather than an object-based

(Kozak 2015) perspective on musical organization, I attempt to side-step any encoding dogma that potentially dictates what popular music "should" sound like. Ohriner (2016) summarizes this issue well, arguing that:

> […] contemporary repertoires supposedly focus on rhythm, timbre, and the embodied feel of playing instruments like the guitar to a greater extent than Western classical music. By ignoring these aspects of the music and importing methods of analysis designed for older genres, music theorists allegedly both missed the point of the music and furthered colonialist agendas (Ohriner 2016: 154).

Whereas some music theorists are adamant that there is nothing inherently problematic about viewing popular music through the lens of Western classical music (e.g., Nobile 2020: xv), like Doll (2018) and others I am sceptical of this stance. This scepticism is based, in part, on primary sources that support the notion that formal training in music theory (i.e., understanding the pitch-based fundamentals of Western classical music) should not be taken for granted amongst popular music's creators and performers. Many guitarists are not formally trained. And even those who have formal training still argue that the physicality, or the "feel of the guitar" (Shea 2022), is a critical component of songwriting.[5] Focusing on the fretboard means music theorists can generalize further about the creation and perception of popular music, beyond just those who have privileged knowledge of pitch and harmony or access to music lessons.

This study also takes an active role in fostering meaningful measures of racial and gender-based diversity through intentional sampling methods. Though agreeable in comparison to Western classical music, there is a conditional truth to de Clercq's statement that "American popular music does this [meets standards of diversity] by nature" (2019, §4). Existing popular-music corpora once again provide an apt frame. A data report by Shea (forthcoming) illustrates that the *RS200* features near-equal representation of artists/ensembles (hereby referred to as "groups") with at least one non-white member by measure of race and/or ethnicity across its 121 artists (n = 61 all-white, n = 60 any other distribution of member identity by race/ethnicity). The *MBB* is conversely less balanced, with all-white groups (n = 238) overshadowing more diverse groups (n = 179). While statistics for the *RS200* are encouraging, Shea advocates that the "at least one member" condition isn't enough to disrupt systemic issues of representation in future corpora. One strategy Shea recommends to avoid artist tokenization is to prioritize "primary status" groups as those whose members are primarily diverse by proportion (e.g., half or more of members are Black, Indigenous, or persons of colour (BIPOC) or non- male) or agency (e.g., a BIPOC or non-male member is the title artist, lead singer, etc.).

This study prioritizes the inclusion of BIPOC artists as seminal contributors to the development of "rock" music—an umbrella term used by many music theorists to refer to a broad category of Anglo-American genres that largely centre on songs written ca. 1960–1999. Despite the intended inclusivity of the term "rock" as it is used currently, rock has long been wrapped up in continual assessments of authenticity (Negus and Astor 2021), resulting in what Sanneh (2004) describes as *rockism*. Rockism comes in many forms, but in a generic and active sense, it is the

process of othering non-conforming artists, songs, and styles. As Sanneh reports, historical examples of rockism include the burning disco records in the late 1970s or the public outrage and shaming that occurred after Ashlee Simpson's failed attempt at lip-syncing on Saturday Night Live. These events showcase value judgements about how music does or does not conform to preconceived notions of rock music. Rockism is therefore a determination of what genres, styles, songs, and artists are not authentically rock.

Historically, rockism is linked with acts of racial discrimination. Most relevant to this issue is a study by Redd (1985) that outlines how the Billboard charts in the 1960s relegated Black artists to the "rhythm 'n' blues" genre label while primarily white artists enjoyed more mainstream success under the "rock 'n' roll" label. As a racially motivated act, it occurred despite the two genres being functionally equivalent. That is, Redd and Stoia (2018) argue that there is no aural, stylistic, or structural difference between early rhythm and blues and rock music, especially when considering that many white rock musicians made a habit of covering rhythm 'n' blues songs originally written and performed by Black musicians. Given the straight line that can be drawn from early rhythm 'n' blues to modern-day rock, especially for guitar-driven works, there is an ethical and stylistic imperative to centre the corpus on songs by non-white musicians whenever possible.

Women have also consistently been excluded from rock's prevue of authenticity. Authors such as Coates (1997) and Davies (2001) observe that in the binary between "rock" and "pop" music, that "pop" music is typically regarded as "feminine" and is simultaneously disparaged as commercial and inauthentic compared to rock. Since the late 1970s, displays of instrumental virtuosity, especially on the guitar, are associated with hypermasculinity (Waksman 1999). Yet women guitarists, including Memphis Minnie, Sister Rosetta Tharpe, and Maybelle Carter, were often the ones pushing styles such as rhythm 'n' blues and country forward through their sophisticated technical prowess on the instrument (Lewis 2018).

Materials and Sampling Methods

In terms of raw materials, *GPT* consists of guitar tablature, which is a type of symbolic music notation meant to model a guitarist's left-hand gestures as they move about the fretboard.[6] Figure 1 provides the guitar riff featured in the verse of "Kiss Me Deadly" by Lita Ford in tablature format from the original Guitar Pro transcription. There, horizontal lines indicate strings while Arabic numbers mark fret positions. A performer reads tablature like Western pitch-based music notation, where the progression from left to right indicates the chronological unfolding of the music. Tablature is not an exact facsimile of a guitar's fretboard from a performer's perspective. Frets farther to the right on the tablature staff, for example, are not positioned closer to the instrument's body.

GPT currently consists of 269 user-transcribed guitar tablature files ("tracks") from top-rated songs retrieved in Guitar Pro format from the website *ultimate-guitar.com*, a popular resource for those looking to learn how to play songs from tablature. When choosing tracks to include in the corpus, I prioritized those resembling rhythm guitar parts. This means that most tracks align with what Moore (2012) describes as the "harmonic filler" layer that provides chordal

accompaniment.

FIGURE 1. The guitar riff featured in the verse of "Kiss Me Deadly" by Lita Ford in tablature format from the original Guitar Pro transcription.

The author and other analysts reviewed all tracks for errors, conducted a formal analysis of each song in the corpus independently, then met to resolve any analytical differences. To ensure consistency across encoders, we closely followed a reference sheet that describes the most common formal sections based on terminology in Summach (2012) and on *OpenMusicTheory.com* (Shaffer et al.). Appendix B provides this reference sheet. After meeting multiple times to reconcile the formal labels across analysts, the initiating measures of each formal zone were marked in correspondence to the Guitar Pro transcription.

Corpus tracks appear in two subsets, each with its own role in contextualizing style and guitar performance practice. The first are tracks from 61 songs featured in Biamonte's (2010) article "Triadic Modal and Pentatonic Patterns in Rock Music." These tracks align most closely with the "classic rock" repertoire on which most music-theoretic studies are based.[7] I refer to this subset as the *Classic Rock* subset throughout the document. The second collection of 200 songs is randomly sampled from the broader *GPT* corpus and is more stylistically heterogenous. I refer to this collection as the *Pop-rock* subset, as all tracks are sampled from songs users classify as either "pop" or "rock" upon submission to *ultimate-guitar.com*.[8]

By the merit of *ultimate-guitar* users deciding a song's genre when they submit, and the fact that others vote on how accurate they believe the tab to be, tracks in the *Pop-rock* subset offer a compelling way to study genre thinking amongst these musicians. The *Pop-rock* subset is also structured to promote balance along the parameters of genre, chronology, and artist demographics. The equal number of songs under the "pop" (*n* = 100) and "rock" (*n* = 100) labels provides a convenient frame for the following analyses. Chronologically, the *Classic Rock* subset prioritizes songs in the 1960s and 1970s while the *Pop-rock* subset emphasizes post-millennium songs. The following tables offer general descriptive statistics about the corpus's elements, including sums of notes, formal zones and transitions, open strings, and chronological distribution. All artists and song names can be found in Appendix A.

Defining Fretboard Space

My primary strategy for assessing the relationship between physical gesture and pitch is to treat the guitar fretboard as a type of coordinate plane, where strings represent the x-axis and frets represent the y-axis. Combined with metadata on tuning, this allows me to explore both melodic and harmonic aspects of fretboard transitions on a note-to-note basis.

I draw heavily on De Souza's (2016; 2018) use of fret-string (f,s) pairs in the following analyses. Like De Souza, I treat frets and strings as coordinates to measure distance between chords with the Cartesian formula. Figure 2 illustrates this process. There, I approximate the centre of a guitarist's left hand by calculating the distance between the lowest fretted note of each chord; in this figure, the guitarist traverses up five frets and down one string between two identically voiced C7 chords.[9] The distance of this transition can be represented in the original fs pairs, following De Souza as (3,2) 1 (8,1) = (+5,-1) or calculated with the Cartesian formula as 5.09 frets.[10] Unlike De Souza, I label the lowest (i.e., thickest- gauged) string as 1 and the highest (i.e., thinnest-gauged string) as 6, so to align the fretboard with a traditional North-facing Cartesian plane.
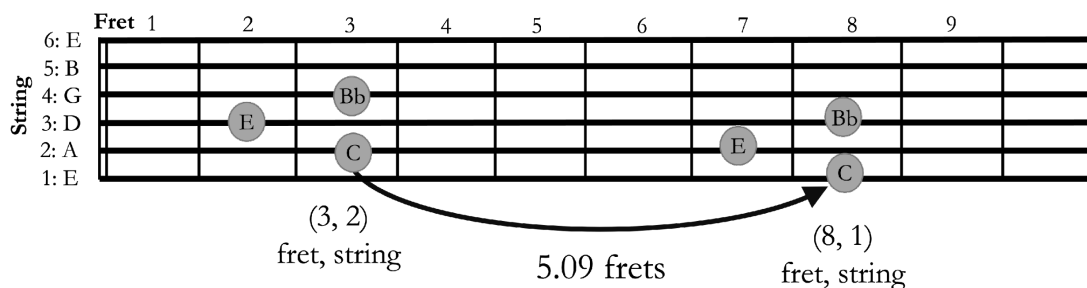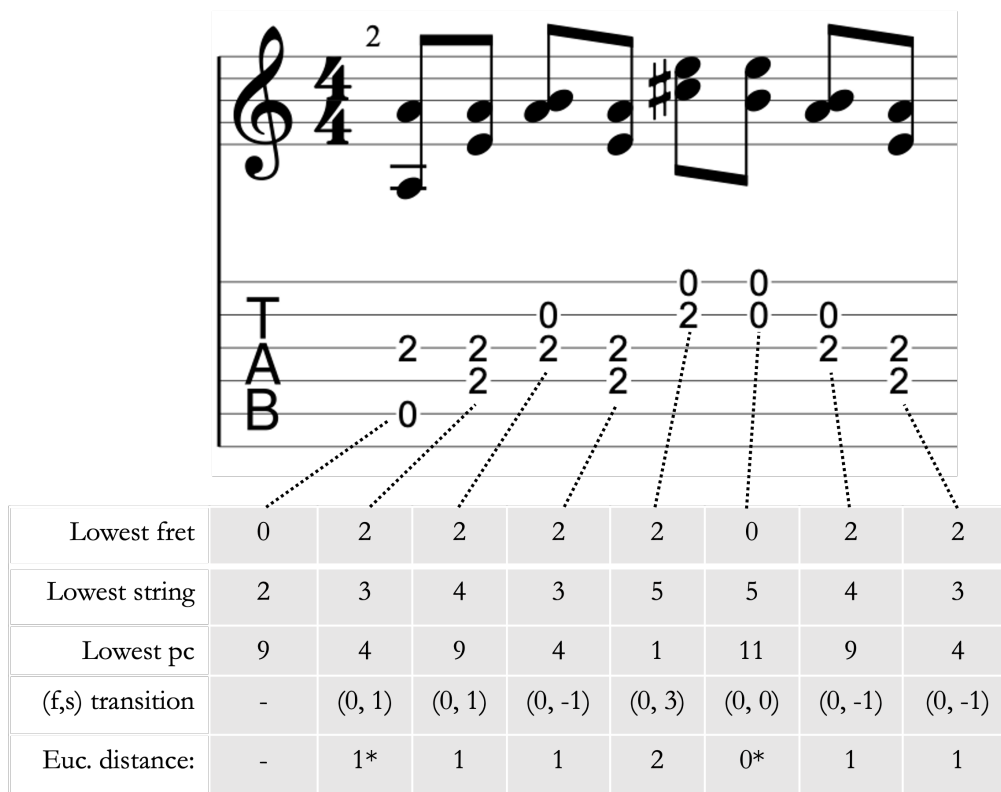

FIGURE 2. Illustration of De Souza's (2016; 2018) use of *fret-string* (f,s) pairs to measure distance between chords with the Cartesian formula.

Corpus data also includes representations of variations on Koozin's (2011) *fret-interval type*. This analytical tool captures generalizable fingering patterns by placing frets into a mathematical set that reflects string order from lowest to highest left to right. Essentially, the *fret-interval* type reduces a chord to its essential gestural characteristics. Koozin focuses primarily on two types, the A-shape barre chord <-13331> and the E-shape barre chord <133211>. These types represent the associated chord shape at any point along the fretboard, including versions of the chord that use open strings.

Figures 3 and 4 illustrate how these formalizations of fretboard space are applied to tablature files in the corpus using an unaltered transcription of the rhythm guitar part from "Again" by Lenny Kravitz. In Figure 3, data associated with melodic bass-note pitch transitions are calculated on a note-by-note basis from m. 2. Every time there is a change in fret or string on the fretboard, information such as pitch class, fret-string transitions, and Euclidean distance are catalogued to capture the gestural nuances of performance through the fingers and lateral hand movements.[11] Figure 4 conversely demonstrates how Koozin's *fits* model the vertical and harmonic aspects of guitar performance in mm. 6–7 of the "Again" transcription. There, the *fits* offer a strategic way to catalogue generalizable hand shapes across

and within performances. The second and third chord, for example, both belong to Koozin's E-shape *fit*. All pitch transitions are calculated by coordinating *fs* coordinates with tuning metadata. Likewise, when open strings are used, the previous *f* is applied to the following one to model physical distance in practice, following Shea (2020)—essentially, when a guitarist uses an open string, no distance is traversed, and the data reflect this.

Lowest fret	0	2	2	2	2	0	2	2
Lowest string	2	3	4	3	5	5	4	3
Lowest pc	9	4	9	4	1	11	9	4
(f,s) transition	-	(0, 1)	(0, 1)	(0, -1)	(0, 3)	(0, 0)	(0, -1)	(0, -1)
Euc. distance:	-	1*	1	1	2	0*	1	1

* Indicates distance modified by open-string transition

FIGURE 3. Data associated with melodic bass-note pitch transitions are calculated on a note-by-note basis from m. 2 (transcription of the rhythm guitar part from "Again" by Lenny Kravitz) see Koozin (2011).

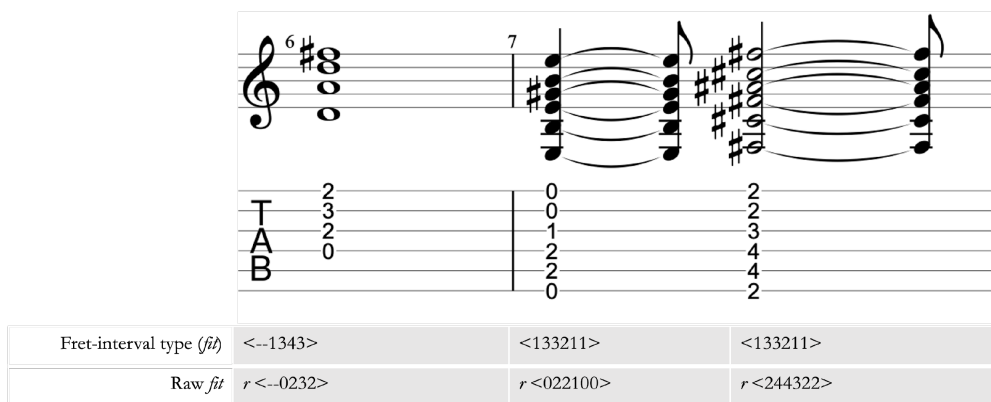| Fret-interval type (*fit*)	<--1343>		<133211>		<133211>
Raw *fit*	*r* <--0232>		*r* <022100>		*r* <244322>

FIGURE 4: Demonstration of Koozin's (2011) *fits* model showing the vertical and harmonic aspects of guitar performance in mm. 6–7 of the rhythm guitar part from "Again" by Lenny Kravitz.

Guitar Thinking

When you hold an object in your hand, such as a tool, your mind treats that object as a literal extension of your body. As Kirsch (2013) explains, tools expand our peripersonal space and thus expand our "body schema" (2003: 3–7). However, because more complex tools are less like the basic features of our bodies (long limbs, five fingers on a hand, etc.), humans find things like guitars harder to interface with without practice. In short, instruments require musicians to change their perception of their body and environment. Kirsh subsequently describes musicians who play instruments as navigating an "enactive landscape," (3) which they define as "the set of possibilities that can in principle be brought into being when an agent [musician] interacts with an underlying environment while engaged in a task or pursuing a goal" (11).

In this section I explore how members of a global community of guitarists interact with the fretboard—Kirsh's underlying environment—while pursuing a goal of successfully performing the guitar part to a rock or pop song. This will establish a baseline of expectations about guitar performance practices for the following discussion of fretboard-informed genre thinking. To facilitate the current discussion, I compare these guitarists' most common fretboard transitions to three other repertoires—the vocal melodies from the *Rolling Stone 200* corpus and vocal/instrumental melodies from the *Essen Folk Song* collection. Comparing these datasets allows us to explore how the affordances of a specific medium, such as the fretboard, voice, or long-standing compositional paradigms, bear out in practice, and how guitar thinking potentially stands apart from other types of musical thinking.
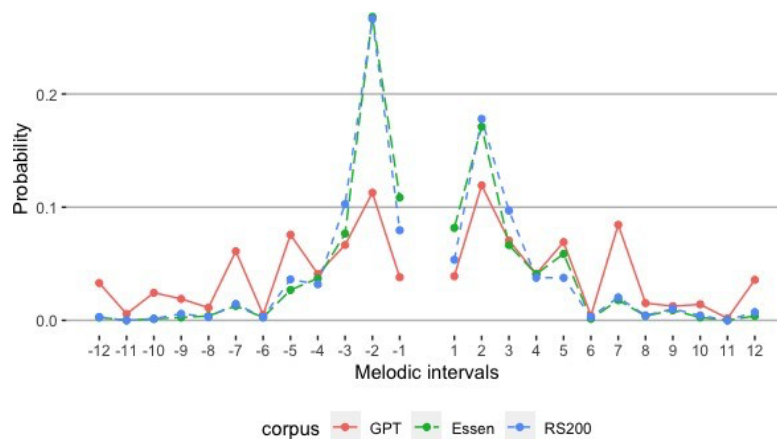

FIGURE 5. The distributions of interval transitions in the *GPT*, *Essen*, and *RS200* corpora.

Figure 5 plots the distributions of interval transitions in the *GPT*, *Essen*, and *RS200* corpora. The x-axis indicates interval transitions in half steps; for example, the number "-7" indicates an interval of a descending fifth. It is not necessary for the reader to know how these intervals sound, per se, but rather should keep in mind that some intervals are easier to play on some instruments/voice than others. Figure 7's y-axis indicates the probability of the specific interval occurring in each collection. Probability measurements work off the assumption that the collection is constructed such that it *might* reflect similar trends in a broader collection. For

instance, the *RS200*'s vocal melodies only represent data from 200 popular-music songs; however, I find it safe to assume this data is   still a reliable indicator of vocal performance practices in popular music. The probability measurements from the *RS200* therefore technically reflect the proportion of interval transitions within the corpus (e.g. a probability of .20 is equivalent to a proportion of .20 or 20%).

Comparing the profiles immediately reveals the influence of performance practice. Both the *RS200* and *Essen* collections consist primarily of sung melodies. As Huron (2006: 74–89) notes, sung melodies feature several generalizable characteristics, including preference for smaller intervals, overall pitch declination, and leaps recovered by a step in the opposite direction. This is apparent in Temperley's data, in the way that larger intervals are much less frequent than smaller ones and as illustrated by the sloping tails of the graphs. *GPT* intervals are more equally distributed across the octave. Despite this, the *GPT* sample does share some characteristics with the vocal corpora: major seconds are preferred over minor ones, minor thirds are more common than major thirds, and intervals such as the tritone remain relatively rare. On the other hand, there are clear differences, such as the emphasis on fourths, fifths, and octaves in the *GPT* corpus. All of these intervals are highly idiomatic on the guitar fretboard when playing in standard tuning, but are more difficult to sing.
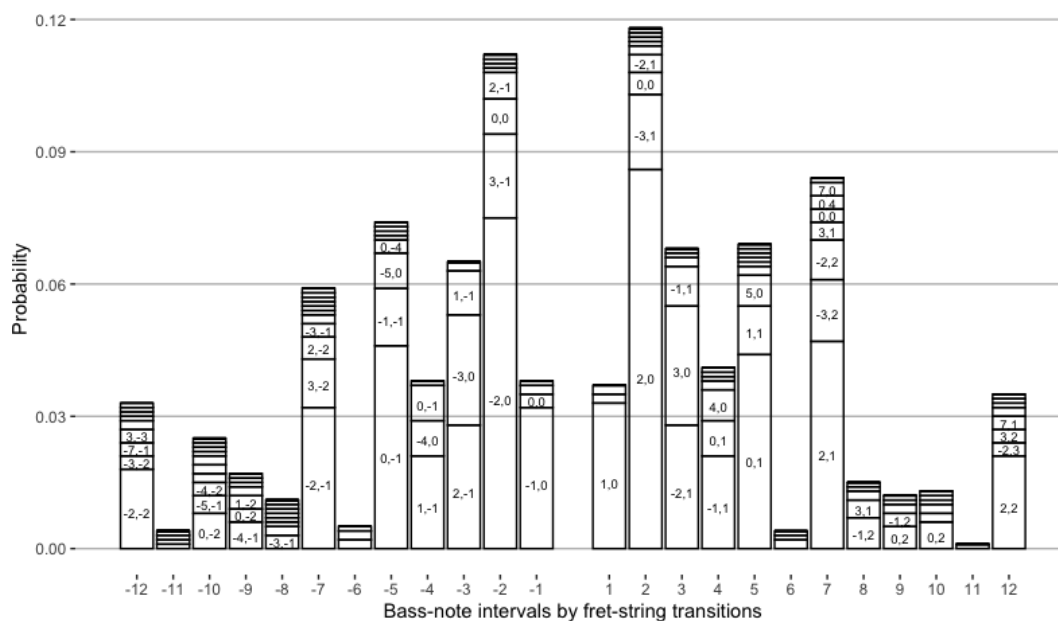

FIGURE 6. The distributions of fret-string interval transitions in the *GPT* corpora as a bar chart.

Figure 6 recasts the *GPT* data from Figure 5 as a bar chart to explicate the relationship between physical gesture and melodic intervals. As before, the height of each bar indicates an interval's proportion in the corpus, but each bar is now split to show the most common physical transitions used to generate the interval. I have also omitted the labels for any *fs* transitions that constitute less than 0.3% of all transitions for readability. A quick survey showcases how physical parsimony is prioritized by guitarists. The most frequent *fs* transitions are positioned on the bottom of each bar. Of these, all fall within 3 frets or less. Shea (2020: 41–42)

defines physical transitions within this range as a "step" in fretboard space. Stepwise fretboard transitions typically do not require guitarists to shift their left hand along the fretboard, similar to how stepwise melodies are easiest to sing.[12]
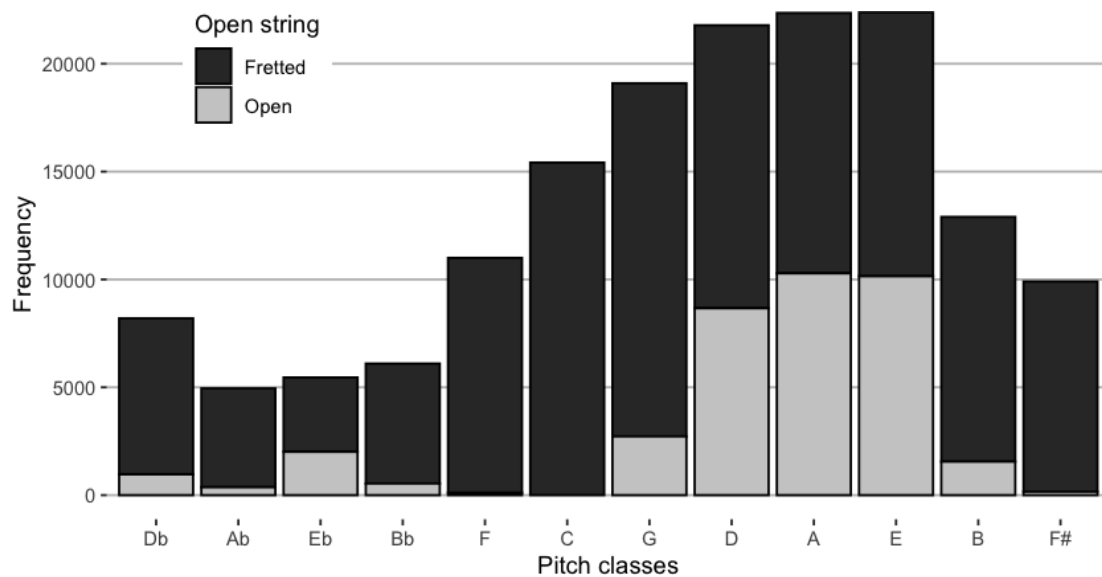

FIGURE 7. The distribution of the corpus's bass-note pitches on a line of fifths.

Tracking distances between bass-note transitions offers a physical-scalar perspective on how a guitarist might move around the fretboard. The pitch transitions associated with these gestures can also reasonably reflect aural-harmonic processes if a few caveats are kept in mind. Corpus studies of popular-music harmony indicate that an overwhelming majority of chords are in root position. This suggests that bass-note pitches can provide a basic sense of a song's harmonic structures, even if not every bass pitch belongs to a harmony as traditionally defined.[13] Figure 7 plots the distribution of the corpus's bass-note pitches on a line of fifths. Each bar is additionally divided into a distribution of open-string and fretted notes. At the broadest level, many bass notes align with sharp-side harmonies. Of these, approximately 24.2% of all bass-note pitches are articulated by open strings. Most guitar tracks in the corpus are in standard tuning (88.7%, $n = 228$), and the most prominent bass notes are those associated with these open strings, so perhaps this coordination is unsurprising. However, it does suggest that open strings are a fundamental component of guitar thinking.

Another way to get at guitar thinking is to look at the most common fret-string positions across songs. Figure 8 provides a probabilistic heat map of the corpus's fret-string positions.[14] This figure was generated by determining the leftmost fret-string position for each song (i.e., the one closest to 0,0) then aligning this point arbitrarily on the note C at (3,2). The numbers in the boxes again represent the probability of that fret-string position occurring in the corpus.
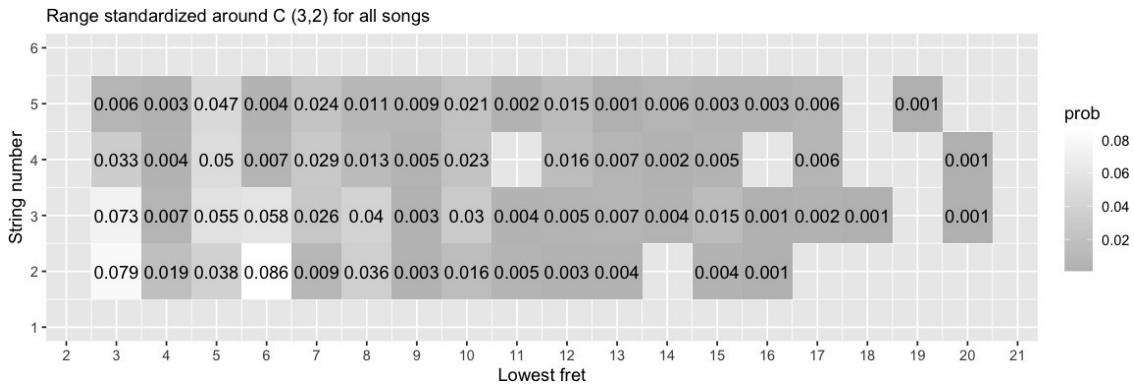
FIGURE 8. A probabilistic heat map of the corpus's fret-string positions.

Scalar and Pentatonic Guitar Thinking

If we synthesize results from the figures above, a highly idiomatic fretboard profile emerges. Strikingly, all imply that pentatonicism is a guiding force in how these guitarists choose to navigate the fretboard more generally. Figure 9 illustrates how to play the major and minor pentatonic scales on a virtual fretboard. Figure 10 meanwhile shows the most probable intervals in the diatonic seven-note major scale and the pentatonic five-note scale. Looking at the pentatonic scale's most common intervals, we see these same intervals prioritized in Figures 5 and 6. Similarly, if we map the virtual fretboard in Figure 9 onto Figure 8, both versions of the pentatonic scale align with the most probable positions, with a stronger alignment to the minor pentatonic.
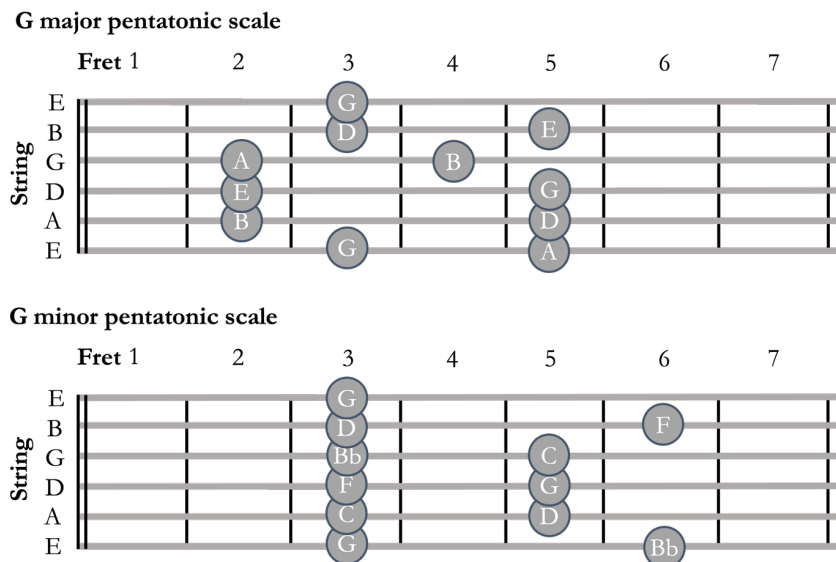

FIGURE 9. How to play the major and minor pentatonic scales on a virtual fretboard.
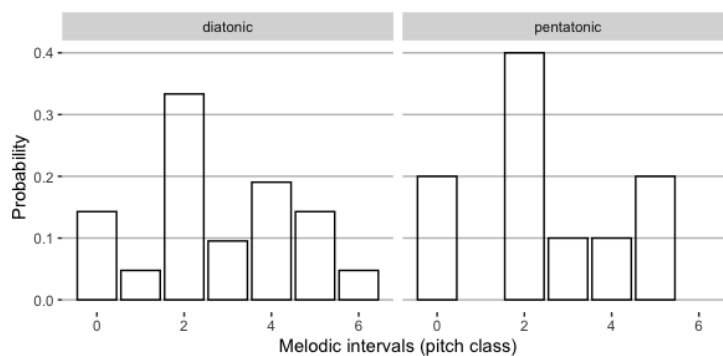
FIGURE 10. The most probable intervals in the diatonic seven-note major scale and the
pentatonic five-note scale.

It might be tempting to look at this data and assume that all the tracks within the
GPT are inherently pentatonic. However, I find this explanation inadequate if we
consider the other pitch profiles discussed. For instance, vocal melodies in rock are
consistently regarded to also be pentatonic, but the most probabilistic interval in
Figure 5's *RS200* melodies is still the descending major second. Prioritizing the
major second can give rise to any number of tonal systems that do the same, such
as whole-tone and octatonic scales. And therein lies the crux of the data we've
observed so far—a focus on scales.

A scalar perspective on the tonal materials of popular music, and especially
guitar-driven music, is also more equitable than a strictly harmonic one. Hearing
harmony is a skill that develops through training. Undergraduate music majors, for
example, take four semesters of music theory to be able to hear how complex tonal
relationships unfold in works such as sonatas. And even then, it often takes these
listeners multiple hearings to realize those structural relationships (Pollard-Gott
1983). An overwhelming number of popular-music artists do not come from a
classical music background and thus do not necessarily prioritize harmonic
thinking. Some even believe traditional music theory inhibits their creativity (Vai
2019) and thus shy away from strictly harmonic thinking altogether.

In practice, guitarists often turn to accessible resources such as *ultimate-
guitar.com*, YouTube videos, or method books in order to link what they have in
their head to the physicality of the fretboard.[15] Many others simply play music
they like and work out what they are hearing for themselves. Because there are
multiple places to play the same note on a guitar fretboard, or even multiple ways
to voice the same chord, physical affordances do have the potential to supersede
most other musical concerns in a guitarist's day-to-day music making. Scales as
overlearned physical-melodic patterns therefore become the one of the most
practical and equitable point to link existing harmonic theories with physical
performance practice.

Discussion: Genre Thinking

To close this preliminary investigation of guitar performance practice, I revisit some
of my findings through the lens of genre. Genre is perhaps one of the most
ambiguous features of modern popular music, in that genre conception is based on
social-cognitive *and* auditory paradigms. Corporations are largely responsible for

social notions of genre as they categorize artists under specific genre labels for marketability (Bracket 2016). Yet there are also stable musical characteristics that help listeners distinguish one genre from another (Dahlhaus 1982). For instance, if we reference *ultimate-guitar.com*'s broadest genre labels, heavily distorted, rhythmically active, power-chord riffs are a reliable indicator of metal music, while simple strumming on an acoustic guitar might signify the folk genre. In these contexts we therefore see an explicit link between timbre, or the distinct quality of a sound, and musical genre.

It is no secret that guitarists are obsessed with timbre. As Fink, Latour, and Wallmark (2018) discuss, guitarists chase distinct guitar tones with fervor, seeking out pedals, pickups, and amps to recreate or enhance their sonic signatures. Indeed, *ultimate-guitar.com* has a wealth of forums on these topics. Biamonte's earlier discussion of distortion and chord voicing in rock meanwhile suggests that the pursuit of sonic clarity might be a guiding force in how guitarists move about the fretboard. Put another way, Biamonte's observations imply that timbre can act as another type of guitar affordance, and specific timbres are undeniably associated with specific genres. If we work from the assumption that guitarists ultimately want their sounds to be understood by their target audiences (Temperley 2004), we might assume that songs in a 'pop' style are more likely to feature chords where thirds are closer together, whereas 'rock' songs will feature more open fifths. Additionally, because minor thirds reduce the dissonance between a chord's root and its overtones, we might also expect that 'rock' styles will rely on scalar systems with greater harmonic consonance, such as the minor pentatonic scale. The inverse of this meanwhile implies songs in a 'pop' style will have more freedom to use major thirds in both melodic and harmonic contexts, such as those featured in the diatonic major scale.

Table 1 and Figure 11 show that this assumption generally bears out in practice. The former offers a table of the top-10 most common *fret-interval types* featuring two or more strings in songs in standard tuning that have been labelled "pop" and "rock" by *ultimate-guitar.com* users. As shown, there is significant overlap by hand shapes, but also noticeable differences—specifically in the way thirds are treated. By putting the third on the top of the chord voicing in a rock style, guitarists diffuse the "crunchy" dissonance between the third's overtone and root's overtone that would be more dissonant if the third were to be voiced lower in the chord. Similar trends emerge in Figure 11 from an intervallic perspective. This graph suggests that the intervallic profile of the "pop" songs is closer aligned with those of classical-music styles. There, I compare the melodic-bass note transitions in the *GPT* to those in the *Yale Classical Archives Corpus* (YCAC), which is a comprehensive database of classical-music works (White and Quinn 2016). What's striking is how closely the pop songs and the YCAC align regarding ascending major and minor thirds and the minor sixth. Whereas descending minor thirds might signal a change in chord root, ascending thirds potentially imply chordal arpeggiation. Again, in this context, timbre may therefore be a factor in that overdrive muddies the sonic clarity of thirds, and overdrive is more closely associated with rock styles. Though this data is exploratory, it appears there's at least a superficial link between timbre, genre, and physical chord voicing in this sample of songs. "Guitar thinking" is therefore potentially a helpful way for guitarists to go about "genre thinking."

TABLE 1. The top-10 most common *fret-interval types* featuring two or more strings in songs in standard tuning that have been labelled "pop" and "rock" by *ultimate-guitar.com* users.

| Hand shape (fit)	Description	Style	Count	Probability
-,1,3,3,-,-	power chord on A	pop	2497	0.041
1,3,3,2,1,1	E-major shape		1436	0.023
-,-,1,3,4,3,	D-major shape		1235	0.020
1,3,-,-,-,-	power chord on E		1174	0.019
1,3,3,-,-,-	power chord on E w/octave		1172	0.019
1,3,3,1,1,1	E-minor shape		1168	0.019
-,2,1,-,-,-	major third on A		1067	0.017
-,1,3,3,2,1	A-minor shape		944	0.015
-,-,-,1,2,-	perfect fourth (D shape)		932	0.015
-,3,3,2,1,-	F over C shape		801	0.013
-,1,3,3,-,-	power chord on A w/octave	rock	2935	0.060
-,1,3,-,-,-	power chord on A		2261	0.046
1,3,3,2,1,1	E-major shape		1987	0.040
1,1	barre shape, var. strings		1773	0.036
1,3,3,-,-,-	power chord on E w/octave		1740	0.035
1,3,-,-,-,-	power chord on E		1708	0.035
-,1,3,3,2,1	A-minor shape		1692	0.034
-,1,3,3,3,1	A-major shape		1202	0.024
-,-,3,2,1,1,	F-chord shape		1188	0.024
-,1,3,3,3,1	A-major shape		1121	0.023
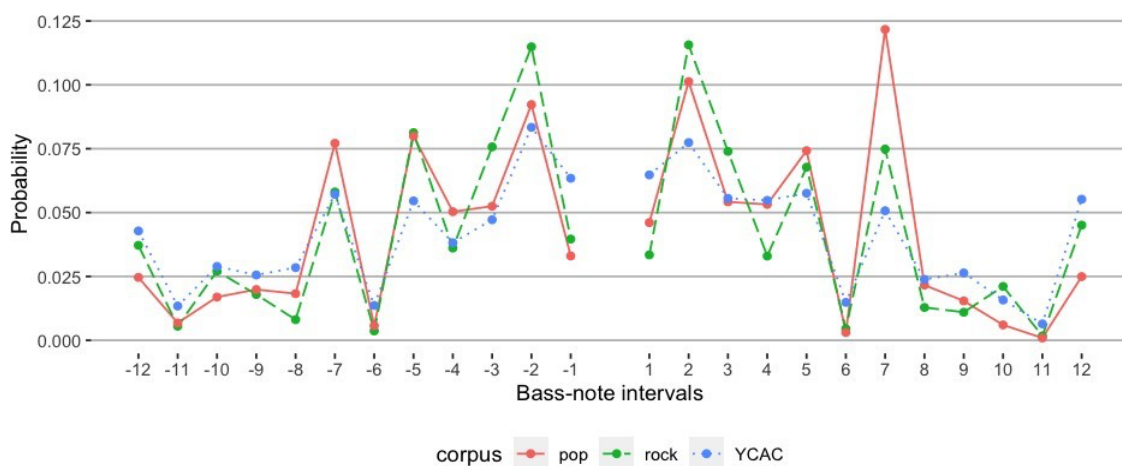
FIGURE 11. Bass-note intervals in the *Yale Classical Archives Corpus* and *GPT* "pop" and "rock" songs.

In this initial exploration of guitar performance practices in popular-music styles, I outline that the basic pitch-based materials of select rhythm guitar tracks featured

on *ultimate-guitar.com* align with fretboard affordances. Such features, such as chord voicings and scalar collections, also seem to be linked to specific genres. These results potentially indicate a type of embodied conception of genre, as the transcriber, not me or another music researcher, qualifies the genre of the song when submitting to *ultimate-guitar.com*. This tablature file is then rated by the community based on accuracy and clarity. Following my discussion about harmonic hearing and expertise above, academic-expert perspectives are not always generalizable to broader populations. Most popular-music artists do not have formal training in musicology or music theory, for example. Analyses of crowd-sourced contributions to online communities therefore offer an inclusive way to explore performance practice in popular music without further marginalizing their members.

Endnotes

1. The term "affordances" was first coined by J.J. Gibson (1966) in reference to how an animal's environment shapes its interactions and movement within that environment. Gibson's work has since significantly expanded across research in human perception, action, and cognition.

2. See https://www.ultimate-guitar.com/forum/showthread.php?t=1864758 (accessed 23 July 2023).

3. This is demonstrated clearly in Yim's (2011) study on fretboard affordances and harmonic motion in the *Rolling Stone* 5x20 corpus. Yim's strategy is to link the corpus's harmonic annotations to generic fingering patterns and use the complexity of those patterns to assess difficulty. Numerous caveats arise from this approach, but the most pressing is that Yim's model has no way of approximating how the guitarist plays the passage in real time, thus responding to the reduction in the *RS* 5x20 with more reduction. This contrasts with a study by Huron and Berec (2009), on which Yim's is predicated, that develops a model of trumpet affordances based on quantitative evaluations of difficulty by practicing trumpet players and fingering permutations.

4. Perhaps the only exception to this is Ohriner's work on metric flow in rap (2016; 2019). Ohriner's longitudinal corpora (1991–2014) of verses directly connects an emcee's performance to rap's stylistic components such as meter, rhyme schemes, and phrase endings. And because of the corpora's robust scope, Ohriner (2016) is able to convincingly disambiguate certain performances, such as emcee T-Mo Goodie's "Mainstream", by comparing song-specific trends across rap performances more broadly.

5. Sources include interviews with artists like Brittany Howard, St. Vincent, and Nancy Wilson. Howard, as a Black woman growing up in poverty in rural Alabama, taught herself guitar by listening to records and advocates her songwriting processed is based on listening and intuition. St. Vincent, who attended Berklee, meanwhile did receive formal training in guitar performance and music theory, but has gone on record as trying to actively work against theoretical knowledge in some songwriting contexts.

6. My use of the word "gesture" here and throughout the document specifically refers to what Jensenius et al. (2010) describe as *sound-producing* gestures; that is, physical gestures specifically enacted to create an audible sound. This terminology is analogous to Montague's (2015) "instrumental gestures."

7. These include recent books by Doll (2018), Temperley (2018), and Nobile (2020), which centre largely on songs recorded in the late 1960s to early 1980s.

8. Henceforth I will place the words "pop" and "rock" in quotes anytime I refer these transcriber-defined genres, while broader references to these genres occur unaltered, such as when another scholar references them.

9. By "higher" frets or movement *upward* I mean gestures that approach the body of the guitar, whereas "lower" frets and *downward motions* are those that move the left hand closer to the headstock. Similarly, "higher" strings refer to thinner-gauged strings and "lower" strings to thicker-gauged ones.

10. De Souza's method advantageously indicates the direction a performer travels along the fretboard, whereas the Cartesian calculation better approximates physical distance in frets "as the crow flies." Both calculations are catalogued in the dataset and play a part in subsequent analyses.

11. This process of surface-level analysis aligns with work by Quinn (2010) and White (2013: 127) and is sometimes referred to as "salami slicing".

12. The *fs* transitions of (0,0) on select melodic intervals arise due to open strings. As described earlier, a guitarist can play F# (6,2) D E (6,0) by merely lifting a finger. Because the guitarist doesn't shift their left hand, the dataset treats this as a non-transition and any Euclidean distance calculations are adjusted accordingly with respect to the open string.

13. de Clercq and Temperley (2011) report that 94.1% of all chords in the *RS200* are in root position. Approximately 90% of chords in the *MBB* are in root position (Shea 2019).

14. This figure was generated by determining the leftmost fret-string position for each song (i.e., the one closest to 0,0) then aligning this point arbitrarily on the note C at (3,2). Note that I am not claiming the leftmost fret-string position is the tonal or even physical centre of any song. The lowest fret-string position is also not always an open string. The left-most boundary is simply a stable point on the fretboard by which all positions can be anchored for comparison. This is why some of the strings represented in the figure are lower than the boundaries of an actual fretboard.

15. A 2014 interview with St. Vincent captures this shared attitude: "I have this sound in my head. How do I get it here in my fingers?" (Moody 2014).

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Appendix A: The *Pop/Rock* subset from *ultimate-guitar.com*

song	artist	style
What's Up	4 Non Blondes	rock
Does Your Mother Know?	ABBA	pop
Chiquitita	ABBA	pop
Rock or Bust	ACDC	rock
Strut	Adam Lambert	pop
I was a Teenage Anarchist	Against Me!	rock
The One that You Love	Air Supply	pop
Hold On	Alabama Shakes	rock
Snowbird	Anne Murray	pop
Barbie Girl	Aqua	pop
Neighborhood 3 Power Out	Arcade Fire	pop

Again	Archive	rock
Arabella	Arctic Monkeys	rock
One Armed Scissor	At the Drive-In	rock
Head Above Water	Avril Lavigne	pop
Help the Poor	B.B. King	rock
The Thrill is Gone	B.B. King	rock
As Long as You Love Me	Backstreet Boys	pop
PPP	Beach House	rock
Lovely Day	Bill Withers	pop
Blackfield	Blackfield	rock
Going Away to College	Blink-182	rock
Real Talk	Bloc Party	rock
Helicopter Bloc Party	Bloc Party	rock
Kreuzberg	Bloc Party	rock
Me Against the Music	Britney Spears	pop
I Wanna Go	Britney Spears	pop
Locked Out of Heaven	Bruno Mars	pop
Them Changes	Buddy Miles	rock
Nubes	Caifanes	rock
Afuera	Caifanes	rock
Sweet Sweet Smile	Carpenters	pop
Yesterday Once More	Carpenters	pop
Just Like Jesse James	Cher	pop
Johnny B. Goode	Chuck Berry	rock
No Particular Place to Go	Chuck Berry	rock
Maybellene	Chuck Berry	rock
Promised Land	Chuck Berry	rock
Key Entity Extraction V: Sentry the Defiant	Coheed and Cambria	rock
The Crowing	Coheed and Cambria	rock
A Favor House Atlantic	Coheed and Cambria	rock
Gravemakers and Gunslingers	Coheed and Cambria	rock
42	Coldplay	pop
Joey	Concrete Blonde	rock
Sunshine of Your Love	Cream	rock
Wasted on the Way	Crosby Stills & Nash	pop
Live and Learn	Crush 40	rock
Girls Just Want to Have Fun	Cyndi Lauper	pop
Kill the Poor	Dead Kennedys	rock
Shouldn't Come Back	Demi Lovato	pop
Get Back	Demi Lovato	pop
Raven	Do As Infinity	pop
Smoorverliefd	Doe Maar	pop
En Algun Lugar	Duncan Dhu	rock

Son of a Preacher Man	Dusty Springfield	pop
How Long	Eagles	rock
Sing	Ed Sheeran	pop
Photograph	Ed Sheeran	pop
Good Rockin Tonight	Elvis Presley	rock
Escape	Enrique Iglesias	pop
Ligaya	Eraserheads	rock
My Heart is Broken	Evanescence	rock
Feet for Hands	Everything Everything	pop
Torso of the Week	Everything Everything	pop
I'm Not a Vampire	Falling In Reverse	rock
The Way	Fastball	rock
Keep the Streets Empty for Me	Fever Ray	pop
Por la boca vive el pez	Fito & Fitipaldis	rock
Dreams	Fleetwood Mac	rock
Rhiannon	Fleetwood Mac	rock
The Chain	Fleetwood Mac	rock
You've Got the Love	Florence + The Machine	pop
Stupid Girl	Garbage	rock
Midnight Blues	Gary Moore	rock
Throwing It All Away	Genesis	rock
Somebody that I Used to Know	Gotye	pop
Here's to Us	Halestorm	rock
Freak Like Me	Halestorm	rock
Niki FM	Hawthorne Heights	rock
Alone	Heart	rock
Weird	Hilary Duff	pop
Visite nuestro bar	Hombres G	pop
Indiana	Hombres G	pop
Un par de palabras	Hombres G	pop
Mao Boy	Indochine	pop
Love Foolosophy	Jamiroquai	pop
River Constantine	Jars of Clay	pop
The Remedy (I Won't Worry)	Jason Mraz	pop
La pluie	Jean-Jacques Goldman	pop
Porque te vas	Jeanette	pop
One of Us	Joan Osborne	rock
Central	John Frusciante	rock
Pusher Love Girl	Justin Timberlake	pop
Terrified	Katharine McPhee	pop
Hot N Cold	Katy Perry	pop
A Moment Like This	Kelly Clarkson	pop
Take It Off	Kesha	pop
Watchin You	KISS	rock
Marchewkowe Pole	Lady Pank	pop

Again	Lenny Kravitz	rock
Are You Gonna Go My Way	Lenny Kravitz	rock
You're No Good	Linda Ronstadt	rock
Funkytown	Lipps Inc.	pop
Kiss Me Deadly	Lita Ford	rock
Help Is On Its Way	Little River Band	rock
My Little Red Book	Love	rock
Andmoreagain	Love	rock
A House is Not a Motel	Love	rock
Papa Don't Preach	Madonna	pop
Oud en afgedankt	Marco Borsato	pop
Shampain	Marina and the Diamonds	pop
Maps	Maroon 5	pop
Ain't That Peculiar	Marvin Gaye	pop
Bitch	Meredith Brooks	rock
Now that We're Done	Metro Station	pop
Off the Wall	Michael Jackson	pop
Love Never Felt So Good	Michael Jackson	pop
Stranger in Moscow	Michael Jackson	pop
D.S.	Michael Jackson	pop
Amateur	Molotov	rock
Hoochie Coochie Man	Muddy Waters	rock
Torn	Natalie Imbruglia	pop
Hella Good	No Doubt	pop
One Thing	One Direction	pop
Live While We're Young	One Direction	pop
More than This	One Direction	pop
The Piano Knows Something I Don't Know	Panic! At the Disco	pop
Now	Paramore	rock
Promises In the Dark	Pat Benatar	rock
Ana	Pixies	rock
Little Red Corvette	Prince	pop
Raspberry Beret	Prince	rock
Ariel	Rainbow	rock
Long Live Rock N Roll	Rainbow	rock
Round and Round	Ratt	rock
Beer	Reel Big Fish	rock
Que vida la mía	Reik	pop
Now and Forever	Richard Marx	pop
Umbrella	Rihanna	pop
Help is On the Way	Rise Against	rock
We Belong Together	Ritchie Valens	rock
Demon Speeding	Rob Zombie	rock
Spending My Time	Roxette	pop

Paint	Roxette	pop
Hang On to Your Love	Sade	pop
Never as Good as the First Time	Sade	pop
Lil Red Riding Hood	Sam the Sham & the Pharaohs	rock
Oye como va	Santana	rock
Angel	Sarah McLachlan	pop
I Knew I Loved You	Savage Garden	pop
I Don't Feel Like Dancin'	Scissor Sisters	pop
Crazy Vibes	Selah Sue	pop
Me enamoré	Shakira	pop
Inevitable	Shakira	pop
My Favorite Mistake	Sheryl Crow	rock
Goodnight Moon	Shivaree	rock
Symphonie	Silbermond	pop
El vals del obrero	Ska-P	rock
Awake and Alive	Skillet	rock
Un misil en mi placard	Soda Stereo	rock
I'll Fly for You	Spandau Ballet	pop
Wannabe	Spice Girls	pop
Stuck in the Middle with You	Stealers Wheel	rock
Just Looking	Stereophonics	rock
Signed, Sealed, Delivered (I'm Yours)	Stevie Wonder	pop
Zephyr And I	Suzanne Vega	pop
Gomenasai	t.A.T.u.	pop
Sad Beautiful Tragic	Taylor Swift	pop
Sparks Fly	Taylor Swift	pop
Love Story	Taylor Swift	rock
Getting Better	The Beatles	rock
Only When I Sleep	The Corrs	pop
Fire Woman	The Cult	rock
Take It Off	The Donnas	rock
Riders on the Storm	The Doors	rock
No Time	The Guess Who	rock
It's Your Thing	The Isley Brothers	pop
Pleasant Valley Sunday	The Monkees	pop
I'm Not Your Steppin Stone	The Monkees	pop
You Just May Be the One	The Monkees	pop
The Land of Make Believe	The Moody Blues	pop
For My Lady	The Moody Blues	pop
Kid	The Pretenders	rock
My City Was Gone	The Pretenders	rock
Middle of the Road	The Pretenders	rock
Going to Hell	The Pretty Reckless	rock
Be My Baby	The Ronettes	pop
Dead Leaves and the Dirty Ground	The White Stripes	rock

Angels	The xx	rock
Massacre	Thin Lizzy	rock
If We Ever Meet Again	Timbaland	pop
Ich bin nich' ich	Tokio Hotel	pop
Schism	Tool	rock
Give Me One Reason	Tracy Chapman	rock
I Wanna Rock	Twisted Sister	rock
Hope	We Came as Romans	rock
El Scorcho	Weezer	rock
When the Children Cry	White Lion	rock
Saving All My Love for You	Whitney Houston	pop
Gloria	YUI	pop
Rue de la paix	Zazie	pop

Appendix B: Student Analyst Procedure Analyzing Form in Pop-Rock

The following definitions and terms come from or are informed by Summach "Form in Top-20 Rock Music, 1955-89" (2012). Some terms have been omitted ("Janus"- module) or added (interlude).

Theoretical terms

Auxiliary module—any passage not included among a song's primary or secondary module (introduction, outro, coda).

Primary module—a module that contains the song's principal materials (strophe, chorus).

Secondary module—a core module that directs attention toward or provides relief from the song's primary modules (bridge, verse, prechorus, post chorus).

Formal modules

Use the following labels as you conduct your formal analysis.

Introduction—material that opens a song and precedes the core module (see above), some rock songs have multiple introductions.

Verse—a lyric-variant module type that "set[s] forth fresh lyrics with each iteration, supplying narrative or emotional context to the choruses" (106). Verses are self- contained (i.e., can stand on their own as a functional formal unit).

Chorus—a lyric-invariant module that establishes the "core message of the song." Often reinforced by "intensifying features" such as increased instrumentation, background vocals, or changes in register (106).

Strophe—a lyric-variant module that contains a lyric-invariant refrain. Typically set to the same harmonic progression and features the same melody.

Refrain—a lyric-invariant module in a strophe, often the title of the song. Occurs

at the end of the strophe ("tail") but can also be positioned at the beginning ("head"). Repeated frequently, a refrain is "the pivotal sentiment or narrative detail in which each strophe originates or culminates" (20).

Note: Summach argues the refrain is a part of the strophe and cannot functionally stand alone. However, refrains often coincide with an audible change in texture. Please label refrains when you hear them.

Interlude—an extended instrumental section used to connect core modules. Contrasts from a bridge or solo in that it showcases a group of instrumentalists. Virtuosic displays are common, but not necessary. If one hears the same solo twice in one song, it is likely an interlude not a solo section.

Bridge—"a region of change and instability whose function is to reinvigorate interest and make the return of the chorus or strophe seem imperative" (61). Often marked a shift in harmony that culminates in a dominant- functioning chord to return to the verse, strophe, or chorus. Usually features a lighter instrumental texture and a quiet/low-register melody.

Prechorus—a module that that builds expectation to the chorus is associated with specific momentum- building features, including melodic fragmentation, acceleration of harmonic rhythm, and movement away from the tonic harmony. (See openmusictheory.com links below.)

Postchorus—a module that occurs after a chorus and decreases the energy of the chorus in transition to a verse. Frequently features vocables (e.g., "ooo" "ahh" "ohhh") and a thinning of instrumental textures.

Outro—closing material that occurs after core modules. Exhibits closing rhetoric, which includes the repetition of a core module (e.g., the chorus), thinning texture, and/or a fadeout.

Tip: Often the final chorus of a song "becomes" the outro. In cases such as these, mark the outro as starting after the first full rotation of the final chorus.

Solo—a module that usually consists of harmonic material from a core module (e.g., verse, chorus or strophe) and features a solo instrument (e.g., guitar, keyboard, saxophone). Unlike an interlude, only one instrument solos at a time while the rest act as accompaniment.

Link (L)—brief instrumental section, often 4 or 8 bars long, connecting two larger core sections (e.g. verse, chorus, bridge); often leads from chorus back to verse.

Solo (N:S)—prominently features a single instrument in the melodic layer, often in a virtuosic display of technique (but not always! for instance, Kurt Cobain's guitar "solo" in "Smells Like Teen Spirit" is more of an anti- solo) and improvisation. Usually placed in second half of song structure. Functions similarly to a classical cadenza (but usually longer). Texture is usually thinner than surrounding sections.

Breakdown (N:BD)—instrumental section without a single prominent melody; may have brief melodic riffs in one or more instruments, or focus primarily on rhythmic and/or textural layering. Primary characteristics are thin, fragmented texture and lack of vocals. Other characteristics vary by genre (in metal, emphasis on drums, often in half-time or a slower tempo; in punk, emphasis on drums, often

double-time or faster tempo; in EDM and dance genres, sometimes rhythm-only but sometimes the drums drop out; in bluegrass it means trading short solos).

Labels

Module name	Encoding abbreviation
introduction	**I**
verse	**V**
prechorus	**P**
chorus	**C**
postchorus	**Z**
bridge	**BR**
solo	**S**
breakdown	**BD**
link	**L**
outro	**O**
other	**N: other**
coda	**CD**
AABA	use letters to represent sections as needed

Links

http://openmusictheory.com/popRockForm.html
http://openmusictheory.com/popRockForm-functions
http://openmusictheory.com/popRockForm-terms
http://openmusictheory.com/popRockForm-containers

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