An Analysis of Harmonic Complexities Among Commercially Successful and Critically-Acclaimed Music in the 1970s and 2010s

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PART I: INTRODUCTION

There is much to be said about the separation between the music critic and the general public. While the critic may vigorously labor on with verbose accusations of musical indiscretions based on theoretical principles and personal unmitigated truths, the public audience may not so much as bat an eye, instead perhaps experiencing the art of music through osmosis and reacting to it as a consequence of nothing they can, or attempt to, explain. Neither of these sides should be seen as inherently wrong or misguided; if one is following their passion within this art form and feels conviction in doing so, there is nothing to be said against that.

Curious, though, that such a divide exists. It is one that has seemingly been accepted by both sides, acknowledging the other's presence but doing little beyond that to find any common understanding. While this is first and foremost a strictly cultural observation, one is also able to find evidence of this disparity within the art itself. Indeed, this is likely unsurprising given the different types of listeners within this contextual relationship. On one side, we have the music critic; one who listens to music as an "intellectual activity of formulating judgments on the value and degree of excellence of individual works" [1]. On the other, we have the populace; an uncontrolled spectrum of listeners whose methods and motives cannot be fully defined, yet whose collective interests can still be measured.

The central questions of this study are: in our modern age, how extensive are the differences in the composition and structures of music favored by critics compared to music favored by the common culture, and how have those differences changed over time? To begin answering these questions, I've focused on one important musical parameter: harmony. More specifically, I focused on the configuration of harmonic color and the use of particular compositional tools within the harmonic layer. The decision to concentrate the analysis on the element of harmony was certainly a practical one, providing a reasonable scope. Further, harmony is an element of music that can be empirically measured in a manageable way, and thus provide reliable evidence for comparison and analysis.

This decision was not made out of practicality alone, however; it was also made based on the experiential factors that the harmonic layer influences in a piece of music. Harmony is important in many aspects of our musical experience: a sense of progression, the affirmation or contradiction of expectations, a defined formal structure, and a general setting of mood, to name a few. These aspects can be taken in regardless of the listener's training, background, or awareness. As stated by composer Aaron Copland, "Just as a skyscraper has a steel frame below the outer covering of stone and brick, so every well-made piece of music has a solid framework underlying the outer appearance of the musical materials. To extract and analyze that implied

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harmonic skeleton is the work of a technician, but the sensitive listener will undoubtedly know when there is something harmonically lacking, even though he may not be able to give the reason for it." [2]. Consciously or subconsciously, the element of harmony holds a key part to a listener's musical experiences and preferences.

That is not to say harmony is the most important musical element when determining quality. There are many other elements at play within a given piece of music, and it would be inaccurate to credit harmony alone as the reasons behind one's reaction to a song, especially when dealing with music in this current age of stylistic diversity and vast sonic availabilities. The goal of this particular study is not to comprehend the musical tastes of any given listener, but instead to examine specific trends in harmonic composition among the music championed by the critical listener and the music championed by the collective culture, or for comparison purposes, the "average listener".

PART II: THE STUDY

I conducted my research on 120 songs across six different years. Each song was either released or rose to high cultural relevance in that year. I focused on three years from two different eras: 1977 through 1979, and 2017 through 2019. For each year, I analyzed the top 10 songs that ended that particular year on the *Billboard* Hot 100 list [3-8], as well as 10 songs that I found were widely praised by music writers and critics.

Billboard magazine has a long-standing reputation for ranking songs in popularity based on relevant calculations that adjust according to the industry's current methods of music distribution. Using their year-end Hot 100 chart of each year's most popular songs is a straightforward method to identify the musical preferences of what I am calling an "average listener". However, determining each year's most critically acclaimed songs presented more of a challenge. While several publications and websites claim to have an aggregate list of critics' top rated songs from each year, there is no absolute consensus among them.

I therefore developed the following methodology. I came up with my own aggregate list for each year's most critically-acclaimed songs based on personal research. Since publications typically publish reviews of entire albums rather than individual songs, I first had to gather a list of the year's most acclaimed albums. I took the year's most positive reviews as well as year-end rankings, when available, from four reputable standalone publications; *Rolling Stone* [9-14], *NME* [15-20], *Paste* [21-23], and *Consequence of Sound* [24-26]; as well as four other website platforms that have their own aggregate lists based on a multitude of original publications from those respective years; *Metacritic* [27-29], *Acclaimed Music* [30-33], *Best Ever Albums* [34-39], and *Album of the Year* [40-45]; and compiled a list of the 10 albums that were rated the highest on average across each of those samples. Then, based on either the album's lead single or the amount of positive mentions in reviews from these publications, I chose one song from each album to use for my data.

There are two notable overlaps in the sources for the commercially successful songs and the critically-acclaimed songs. One is the 1977 album *Rumours* by Fleetwood Mac, which by my measurement was the most critically-acclaimed album of that year, as well as being the top selling album of 1977 according to Billboard with several songs charting on the Billboard Hot 100 list; in fact, the song "Dreams" from this album made a brief appearance on the Billboard Hot 100 list as recently as October 2020 [46]. The other overlap is Kendrick Lamar's 2017 album *DAMN.,* a Pulitzer Prize winning work highly acclaimed by critics that also had a song, "HUMBLE.", reach #4 on the year end Billboard Hot 100 list. No other songs utilized in this analysis had a significant overlap between their commercial and critical success.

For each song, I analyzed every harmonic progression using Roman Numeral analysis. From there, I measured six different aspects of the harmony:

- percentage of primary harmony (tonic, dominant, and subdominant chords) used
- percentage of other diatonic harmony used
- percentage of non-diatonic harmony used
- percentage of progressions that used non-chord tones
- percentage of progressions that used syncopation in harmonic rhythm
- number of changes in key or tonal center

Calculating the percentages of each type of harmony took some creative thinking. While it would have been possible to count exactly how many times every chord was used in a particular song and take a percentage from there, that would not have accurately reflected the artistic harmonic decisions made by the songwriters. That method would have given too much weight to chords that were used in repeating progressions, and would have been more a reflection of the form rather than of the actual harmonic language. So, my solution was to count a chord every time it appeared in a new harmonic progression. If the progression repeated back to back, those chords were only counted once. If the progression changed, even with just one added chord, those chords were counted again. Chords would still be counted even if the particular progression occurred earlier in the song, as long as there was a change in progression between them. These totals were then added up and the percentages of primary harmony, other diatonic harmony, and non-diatonic harmony were calculated.

I also must clarify that the syncopation I measured was syncopation of the actual harmonic rhythm only. I did not take into account any syncopated patterns that were strictly rhythmic where the harmony stayed on the same chord. I only counted the progression as using syncopation if there was a chord change on a weak or unaccented beat. I also considered the progression to have syncopation if there was an obvious mixed meter structure within a larger meter. For example, a song having a broadly recognizable 4/4 meter while using an accented 3/8-5/8 pattern for its harmonic rhythm was considered syncopated, as the typical strong and weak beat pattern of a 4/4 meter was not followed. Syncopation, along with non-chord tone usage, was calculated by the percentage of progressions that used these tools within the song.

Lastly, before the data is discussed, I feel the need to make a small disclaimer on a few specifics of the harmonic analysis itself. It should come as no surprise that this type of analysis can get rather subjective, and so I will attempt to explain a few of the instances where the analysis may come across as unconventional. The type of harmonic analysis done here is very triad-based, centered around explaining function rather than accounting for every single note heard. This better served my purpose of interpreting the harmonic language at its core. It also helped to keep the same analytical standards throughout. For the most part, using Roman numeral analysis was completely sufficient and clear; however, seeing that this method of harmonic analysis was invented to explain music of the Common Practice Era (roughly 1650-1900), and not so much thought of for today's era of popular music, there were two rules that needed bending from time to time.

The first of these was when dealing with unresolved secondary chords. In most cases throughout history, an E Major chord in C Major would be considered a V/vi, or possibly as a chromatic mediant that aids a modulation. However, in our current era, it has been more common for such an E Major chord to carry neither of those functions, and instead only be explained as a non-diatonic III chord.

The other instance involved the lowered 7th degree. While the diatonic chord built on the 7th scale degree is half-diminished in major keys and fully diminished in minor keys, many modern popular songs are based on natural minor, with its lowered 7th. This results in a diatonic VII chord instead of a vii° chord. I used my judgement as to whether these chords should be considered a diatonic VII or a non-diatonic bVII, which greatly depended on how strong of a presence a dominant V chord was. If a dominant V had little or no presence, I considered this chord to be a diatonic VII, on the basis of it acting as a dominant substitute in the natural minor scale.

In the appendix, you will find a spreadsheet that lists every song I analyzed with results of all the components I measured. The graphs that are shown in this paper do not label every song individually due to space constraints.

PART III: RESULTS

In discussing the differences between the harmonic layer in popular songs from 1977-1979 and popular songs from 2017-2019, perhaps the most significant statistic is the actual number of distinct progressions used on average in each song. Figure 1 shows the number of unique harmonic progressions used in 10 of the most popular songs and 10 of the most critically acclaimed songs from the six aforementioned years. Of the four different sets that were analyzed, the 1977-1979 popular songs used the most harmonic progressions on average, with those 30 songs averaging just under 4.5 progressions per song. That is contrasted significantly by the 2017-2019 popular songs, which on average used a mere 1.6 progressions per song. In

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fact, the only popular song from 2017-2019 using more than three progressions was Bruno Mars'
"That's What I Like" from 2017, which is part of an album that is described as "a full-length
field trip back to retro-soul, a nine-song travelogue examining the many R&B micromovements
of the '80s and '90s" [47]. Being an obvious homage to the R&B-style of previous decades, it
can be surmised that the use of multiple unique harmonic progressions in this instance was done
in replication of this past style, and therefore not so much a reflection of the current era's
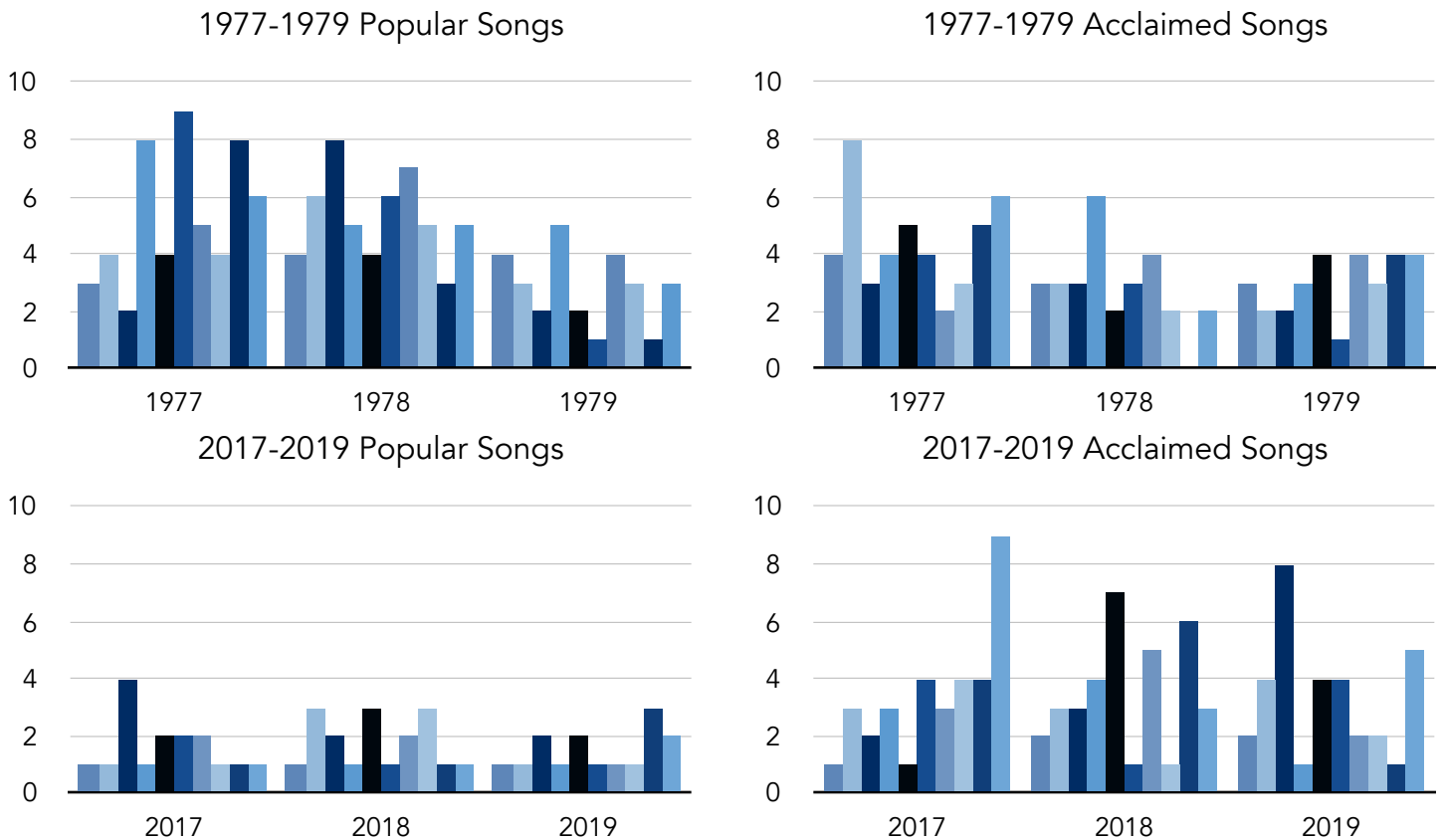harmonic trends.

Figure 1

Figure 1: Number of different chord progressions used by each song among all four data sets.

Such a drastic shift in the number of unique harmonic progressions used over the course
of forty years is worth noting, since although not directly related to either the harmonic colors or
compositional tools employed, it shows a change in how the harmonic layer has been perceived
and valued by songwriters and mainstream culture, consciously or subconsciously, over time.
Based on this sample, one can infer that average listeners of the late 1970s tended to value a
certain amount of chordal diversification within their aural experience, which could potentially
signify a desire for varied ambience and feelings of forward direction, whereas average listeners
in the current era tend to value looping harmonic progressions that come with little variance,

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which could potentially signify a desire for feelings of stasis and becoming immersed in solitary musical moments.

The 2017-2019 critically-acclaimed song set, on this particular statistic, reveals an interesting multiplicity. Although there were six acclaimed songs from 2017-2019 that used only one progression, there were also five songs that used at least five different progressions, potentially showing the diversity in form and feelings of direction that critical listeners enjoyed. In 2017 alone, the critically-acclaimed hip-hop song "Big Fish" by Vince Staples used only a single i iv V VI progression throughout, while the acclaimed song "Real Death" by Mount Eerie used a through composed form with a staggering nine different unique progressions, tied for the most out of all 120 songs analyzed. This also shows, perhaps, that the sheer number of different progressions in a song may not matter so much to critical listeners, as opposed to the average listener.

In comparing the two sets of popular songs with the two sets of acclaimed songs in this metric, we see that there is much less of a difference between the two eras of acclaimed songs. While not necessarily a mirror of each other in terms of diversity in amount of progressions used between each song, the two eras end up having nearly the exact same average, with the 1977-1979 acclaimed songs using 3.37 unique progressions per song on average and 2017-2019 acclaimed songs using 3.4 on average. While the extreme closeness of that number may indeed be rather coincidental given the small range of the particular data set, it is still important to note this distinct similarity in the harmonic layer between the two different eras of acclaimed music, as opposed to the vast difference between the two different eras of popular music. Although this example might have been rather straightforward and predictable, there are several more nuanced factors that I measured, all of which come to a similar conclusion.

One such measurement is the use of non-diatonic harmony. Of course, the specific purposes and reasons for using non-diatonic harmony in tonal music vary from example to example. A bVI chord in one song can serve a different function, evoke different feelings, and be heard in a very different light than a bVI chord in another song, depending on the different musical devices acting around it. There are, however, some common threads that can surely be agreed upon without much difficulty. The common thread to mention for this study is the fact that non-diatonic harmony, at its broadest, adds a species of nuanced harmonic color. The addition of non-diatonic chords to the harmonic color represents a structural decoration that typically exhibits a movement away from tonic, and thus what could be considered a movement away from a listener's expectations.

Figures 2 and 3 examine the usages of primary harmony, other diatonic harmony, and non-diatonic harmony. Figure 2 focuses on four songs, one from each data set, to display their proportions of these three categories of harmonic language. The song "Evergreen" by Barbara Streisand, reaching #4 on the Billboard Hot 100 in 1977, used the most non-diatonic harmony of these four examples, as well as utilizing the largest number of chords overall. The song "Shape Of You" by Ed Sheeran, ending 2017 as the #1 song on the Billboard Hot 100, used only four

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chords in its harmonic language, none of which were non-diatonic. The two songs from the critically-acclaimed sets in this figure, "The Chain" by Fleetwood Mac and "Green Light" by Lorde, each used a single non-diatonic chord, a borrowed IV and a bVII, respectively, to a rather considerable degree within their harmonic structure.
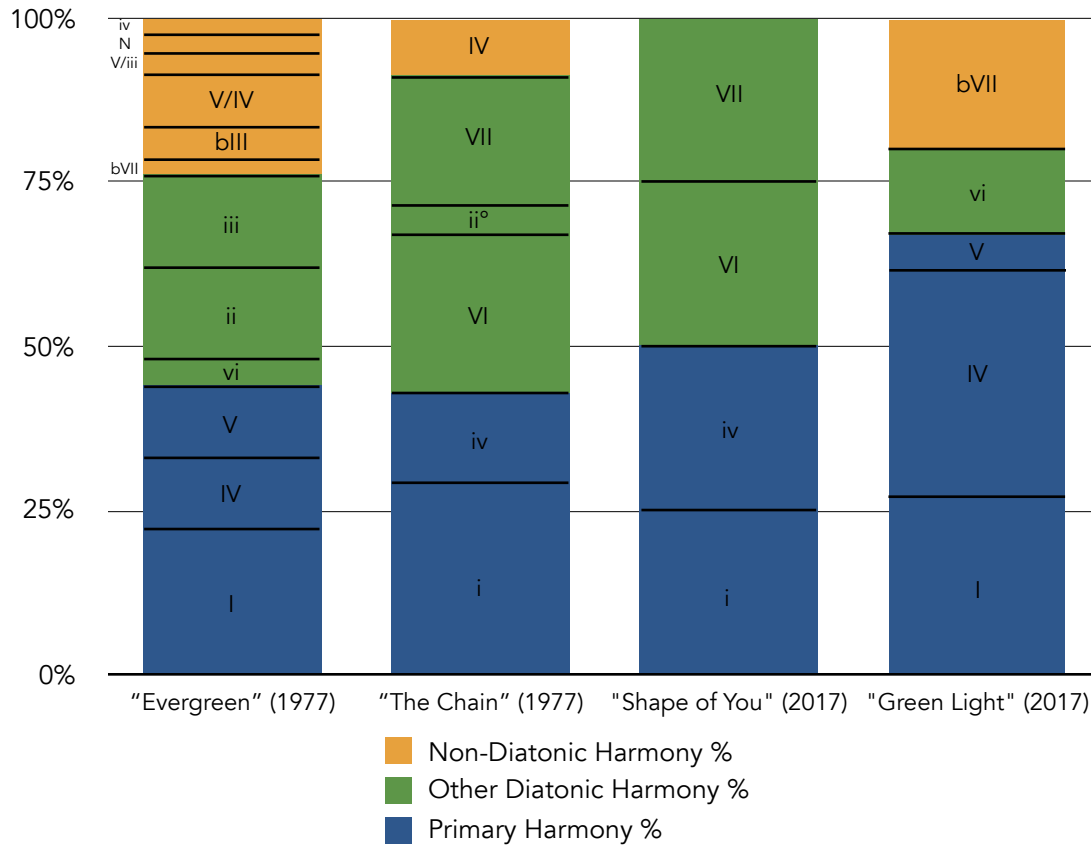
Figure 2

Figure 2: The percentage of primary harmony, other diatonic harmony, and non-diatonic harmony used in four separate songs, one from each data set. Also included is a breakdown of the percentage that each chord was used.

Figure 3 expands this measurement to every song in the study, zooming out to display the amount of primary harmony, other diatonic harmony, and non-diatonic harmony used across all four data sets. Each song is represented by a single vertical bar that displays the proportion of how much these three categories contributed to the harmonic language. Primary harmony (I, IV, and V) unsurprisingly makes up the majority of songs from both eras. Those three chords have certainly come to be the cornerstone of tonal songwriting. The intriguing aspect of this measurement does not lie in how prominent the primary harmony usage was, but rather in how often other chords, specifically non-diatonic chords, were used in conjunction with said primary harmony. While the acclaimed songs from 1977-1979 and 2017-2019 had similar results in this metric, the popular songs from 1977-1979 and 2017-2019 differed greatly.

Figure 3
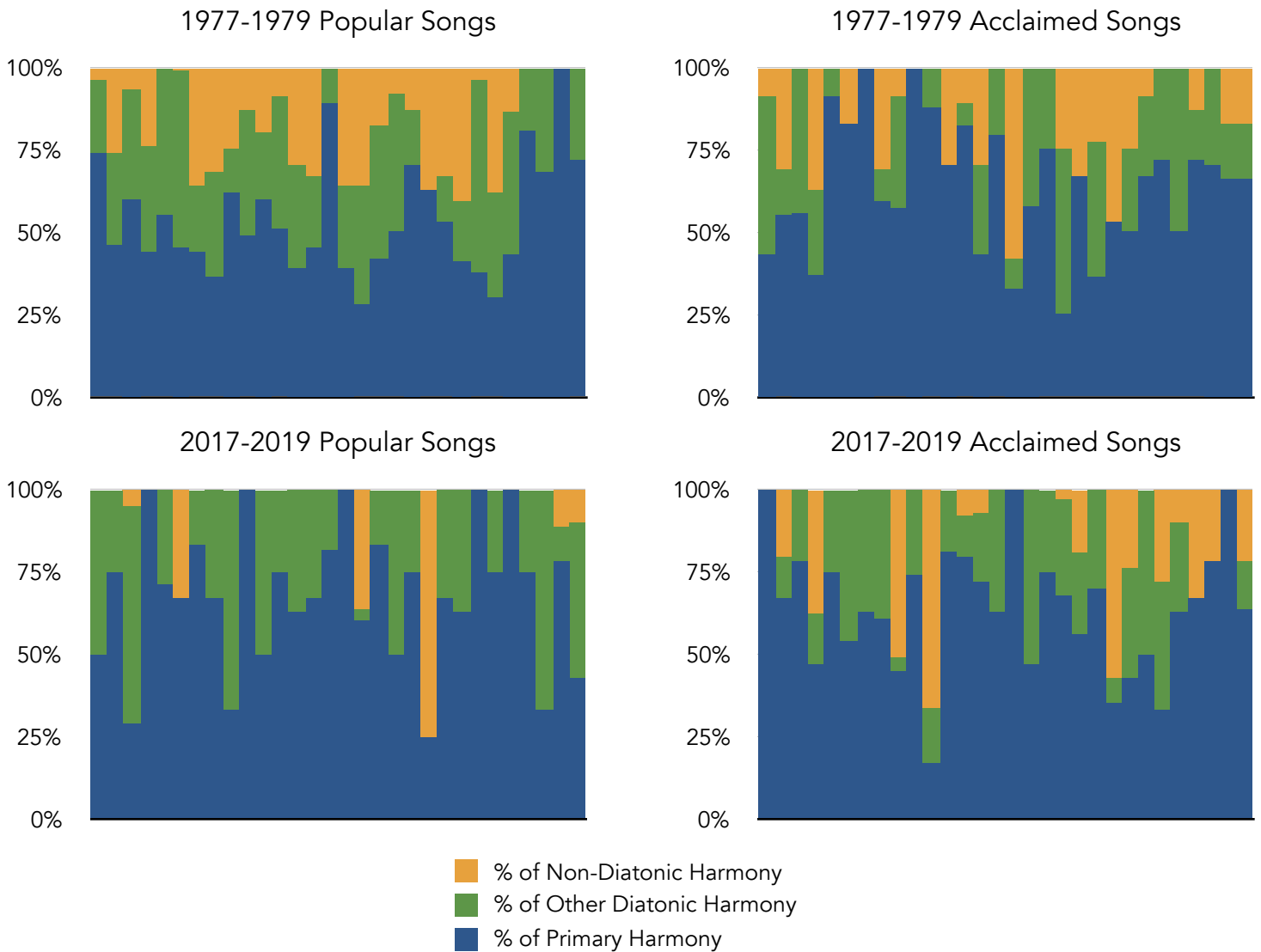
Types of Harmonic Language Used

Figure 3: A visual representation of the amount of primary harmony, other diatonic harmony, and non-diatonic harmony used in all songs in each data set.

The results for the average amount that these three categories of harmony were used in each song across all four sets are found in Figure 4. Focusing on the two sets of acclaimed songs, we can see that the usage of each type of harmony during the two eras is within 1.6%. While only a sample size of six years, there is reason to believe that critical listeners have maintained a relative desire for this amount of balance in chord function and color within a 3-5 minute song, despite the massive amounts of change that the music industry has gone through in the rises and falls of different styles, instrumentation, and distribution methods.

There is hardly any concordance in the makeup of the harmonic language between the two eras of songs that were deemed popular and culturally relevant at their respective times. The dip in the usage of non-diatonic harmony from an average of 17.9% in 1977-1979 popular songs to a minuscule 5.6% in 2017-2019 popular songs demonstrates how significantly different the music from these two eras of culturally relevant music sound in terms of harmonic color. These particular numbers may not even represent the reality of the harmonic language differences in the best way; it might be more appropriate to note that out of the 30 popular songs analyzed from 2017-2019, only six of them used any amount of non-diatonic harmony at all, with only half of those songs using any non-diatonic harmony beyond 11%.

Figure 4

	Primary Harmony	Other Diatonic Harmony	Non-Diatonic Harmony
1977-1979 Popular Songs	53.9%	28.2%	17.9%
1977-1979 Acclaimed Songs	63.4%	21.4%	15.2%
2017-2019 Popular Songs	68%	26.4%	5.6%
2017-2019 Acclaimed Songs	64.2%	22.2%	13.6%

Figure 4: Average percent of primary harmony, other diatonic harmony, and non-diatonic harmony used in each song across all 30 songs analyzed in each set.

Compare that to the popular songs from 1977-1979, all but six of which used some sort of non-diatonic harmony. The mainstream culture in the late 1970s seemed to value the use of a wide range of chords, specifically a concealment or deviation from the aural security of tonic at times. In the late 2010s, the mainstream culture has seemed to shift into heavily desiring the aural security of tonic with little deviance from what's come to be expected. In other words, average listeners from 40 years ago valued having an amount of harmonic unpredictability, while the average listeners of today do not seem to value harmonic unpredictability to any discernible degree, instead valuing the ability to predict the sonic directions of the harmony.

While harmonic color in root motion and chordal function can be one way in which musical decorations and deviations from a basic structure are created, that is hardly the only method. Aside from the usage of diatonic vs. non-diatonic harmony, the usage of non-chord tones (or added-chord tones), syncopation, and key changes were also measured as part of this study. These are three other compositional tools that, at a basic level, provide a layer of nuance and complexity to the harmonic foundation. As discussed with the use of non-diatonic harmony, there is no concrete definition as to what these tools exactly signify and accomplish from song to song; the use of an added 9th or a chord change on an unaccented beat can have very different feelings attached to it depending on the context. However, there should be little dispute that such tools, at a minimum, add a species of embellishment to a musical foundation.

It would be curious to see, then, how these other tools of harmonic complexity are used either in tandem or in the absence of non-diatonic harmony across both popular and critically-acclaimed music. An interesting question arises from this particular analysis: if a song did not use any non-diatonic harmony in its language, were other tools still employed to introduce embellishment or intricacy to the harmonic layer? Is there a certain balance that can be found in these particular compositional tactics, and if so, how does this balance differ between eras and types of listeners?

Figure 5

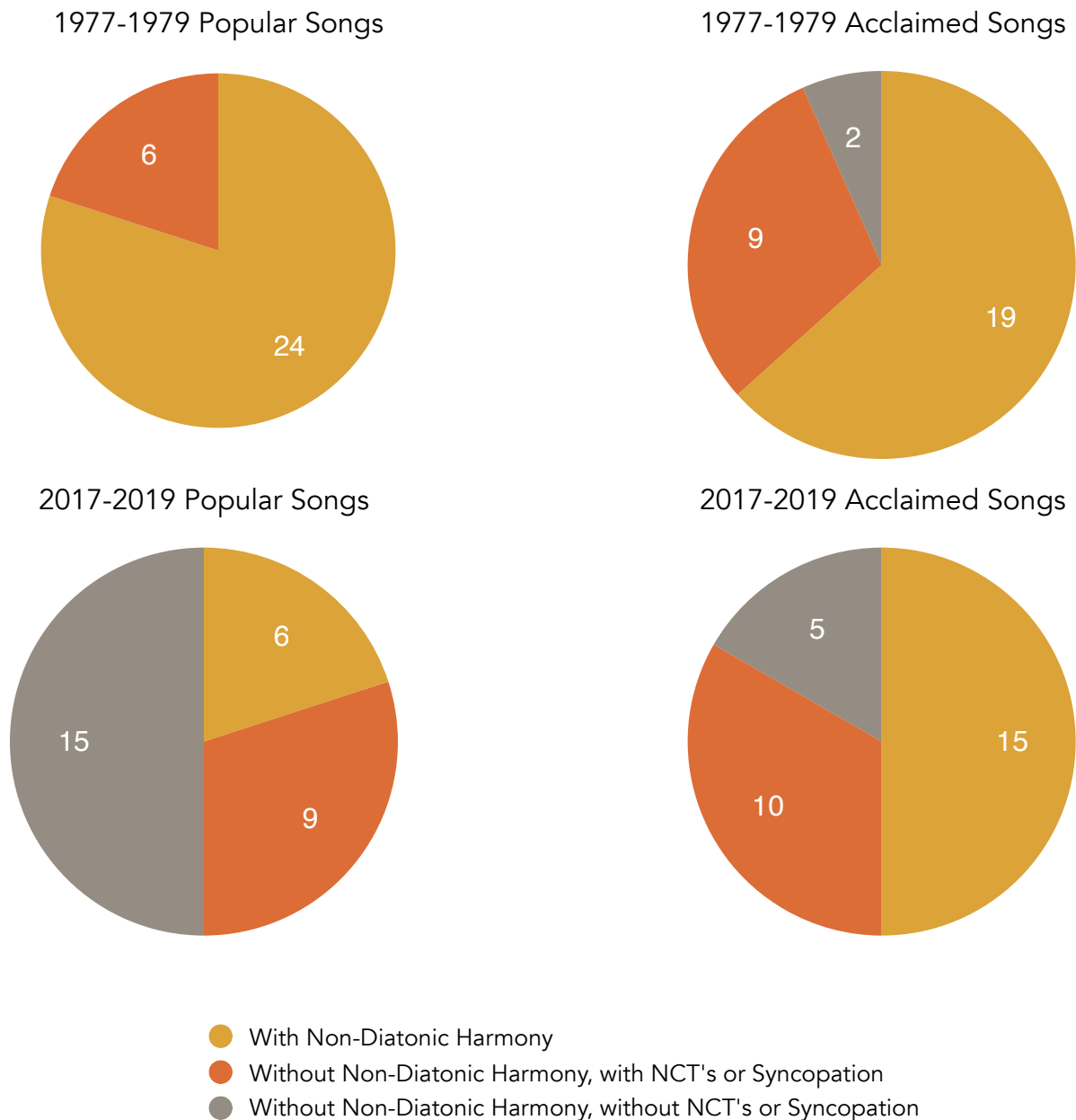**Non-Chord Tone and Syncopation Usage in Absence of Non-Diatonic Harmony**

1977-1979 Popular Songs

1977-1979 Acclaimed Songs

2017-2019 Popular Songs

2017-2019 Acclaimed Songs

🟡 With Non-Diatonic Harmony
🟠 Without Non-Diatonic Harmony, with NCT's or Syncopation
⚫ Without Non-Diatonic Harmony, without NCT's or Syncopation

Out of the ten most popular songs from each year between 1977-1979, only six of them did not use a single non-diatonic chord. While a noteworthy statistic within itself, perhaps even more interesting is the fact that each of these six songs also used either added-chord tones or syncopation, or both, to some degree in their harmonic progressions. Regardless of how these decisions came to be made by the songwriters, it is noticeable that involving some sort of harmonic complexity was prioritized. This served to be a common thread amongst this particular data set, and thus the desires of the mainstream listeners and the culture in the late 1970s.

Was this only a priority in the most popular music at the time, or was this an element that carried throughout other music being written and possibly considered important among critical listeners? Any answers found here cannot be considered fully definitive; however, we can see that the critically-acclaimed music from these same three years also maintained a level of harmonic complexity, even if not from non-diatonic harmony. Of these thirty songs, eleven did not employ any non-diatonic harmony, but nine of those eleven did use a mix of added-chord tones and syncopation, thus maintaining some variety of structural decoration. This shows that the fondness for having at least a semblance of nuance in the harmonic layer was largely shared between the average music consumer and the critical listener in the late 1970s, despite, again, the many stylistic differences that existed between the music that was considered popular and the music that was considered to be highly acclaimed by professionals.

Forty years later, we notice that this particular similarity between the average music consumer and the critical listener is completely gone. Regarding the critically-acclaimed songs from 2017-2019, exactly half of the thirty songs analyzed did not use non-diatonic harmony; however, of those fifteen songs, ten used at least one other compositional tool that introduced a layer of complexity to the harmony. While this ratio is a bit lower compared to the songs from 1977-1979, there is still a case to be made that the desire remains for some element of harmonic decoration and deviations from the basic structure in the tastes of modern critical listeners.

The ten most commercially successful songs from each year between 2017-2019 paint quite a different picture as to how much harmonic complexity is prioritized among these particular songwriters, as well as the average modern listener. As previously discussed, non-diatonic harmony was hardly used in these songs; twenty-four out of the thirty did not utilize any chords from outside the key. Of those twenty-four, only nine of them used any non-chord tones or syncopation in the harmonic layer. Also, with one exception, none of the songs in this data set had any changes in tonal center throughout; the one that did, Travis Scott's "Sicko Mode", can be described as a non-sequitur piece with three distinct through-composed sections. As observed by music critic Alphonse Pierre, "Its three abrupt and overwhelming beat change-ups are like a rollercoaster that whips your neck and jabs your sides with sudden twists and turns" [48]. Almost coming across as three different songs, the actual impact of the key changes in this

particular track can be perceived as minimal compared to a key change within a more structured form.

That leaves fifteen of the popular songs from 2017-2019, half of the set, devoid of the composition tools measured here that produce embellishments, deviations, or nuanced change from the skeletal harmonic structure. This does not necessarily mean that harmonic complexity is distasteful to the average listener today, as these tools still had a presence in other songs of this particular data set. It may, however, lead us to believe that decorating harmonic structures with these historically-known tools is not a significant priority in the collective taste of current culture. While we are able to find commonalities in the discipline of songwriting between the critically-acclaimed music of different eras, the substantial contrast in songwriting priorities between current popular music and the popular music of forty years ago, along with the critically-acclaimed music today, suggests that new paths are taking shape within the discipline.

This analysis not only shows the number of songs that used the compositional tools of added-chord tones and harmonic rhythm syncopation, but also the extent to which each song used them. While some songs used these elements of harmonic complexity in every progression, others employed them more sparingly. Is there a discernible trend visible among these eras and types of listeners considering the usage rates of these particular compositional devices? Did there ever exist a priority for songs to contain such variety of harmonic complexities? The analysis does show some specific trends.

Figure 6

	Variety in NCT's or Syncopation Usage	Stagnancy in NCT's or Syncopation Usage
1977-1979 Popular Songs	19	11
1977-1979 Acclaimed Songs	20	10
2017-2019 Popular Songs	5	25
2017-2019 Acclaimed Songs	12	18

Figure 6: Number of songs in each set that contain a variety (between 10-90%) in non-chord tone or syncopation usage, vs. the number of songs that contain a stagnancy (0-9% or 91-100%) in non-chord tone or syncopation usage.

I considered any song that used either non-chord tones or syncopation in 10-90% of their progressions to have utilized a variety in this type of harmonic decoration. I considered any song that used both said tools in either 0-9% or 91-100% of their progressions to have established a

stagnancy in this type of harmonic decoration. Figure 6 shows the results in the number of songs from this analysis that fell into these two categories per data set.

As we can see from Figure 6, songs from the 1977-1979 data sets used these compositional tools with more variety, on average, than songs from the 2017-2019 data sets. While not overwhelming enough to state that using added-chord tones or syncopation in a fluctuating way was definitely favored by listeners at the time, there is at least a trace of this type of variety in the harmonic layer being more prevalent among the preferred music of listeners in the late 1970s. In this instance, there is no distinction that can be made between the desires of the average listener and critical listener; the popular and critically-acclaimed songs from these three years used in this analysis had a very similar ratio in variety versus stagnancy in non-chord tone and syncopation usage. This could mean that either a wider range of listeners shared similar tastes in this regard, or that the common songwriting styles at the time shared this priority to a degree.

There is a considerable change in this statistic between the late 1970s and the late 2010s, with stagnancy in this type of harmonic decoration becoming more conventional and holding the majority among the songs that were analyzed. Perhaps even more significant than this difference between eras, though, is the disparity that is now found between these popular and critically-acclaimed songs of the same era. It is now apparent that a preference in a certain harmonic feature once consistent between multiple types of listeners is now experiencing a rather clear divide.

It can be argued that the presence of either variety or stagnancy in these compositional tools did not have a significant effect on the tastes of critical listeners between 2017-2019. Given the broadness of the measurements taken and the general proximity of the two categories in this set, no assumptions can be accurately made about the preferences in quantity of non-chord tone or syncopation usage among critical listeners. This is similar to the conclusion found in this statistic from the 1977-1979 data sets, for although differing in totals, the results are not gravitating enough to one side to warrant any major evidence in a type of listener's particular preference.

Observing the data from the 2017-2019 popular songs, though, we notice a more overwhelming statistic. Of the songs analyzed in this set, 25 of 30 had an established stagnancy in non-chord tone and syncopation usage, which seems to cross the line from a statistical anomaly to a tangible trend. In contrast with the rather middling numbers from the critically-acclaimed songs of the same years, there is a rather distinct preference among the average listener for songs that contain little to no variety in these tools of harmonic decoration. Not only is there a more concrete statement to be made about the preferences of these listeners; it also demonstrates an amount of divergence in musical tastes between critical listeners and the general culture over time.

PART IV: CONCLUSIONS

The measurements taken as part of this analysis all point to a rather similar conclusion regarding the nature of the harmonic layer in music between eras and preferences among certain types of listeners. While acknowledging the limits of the scope and method of the analysis, a conclusion can be reached that, in the last forty years, the tastes in harmonic complexities of those who listen to music critically have not changed a considerable amount, while tastes in harmonic complexities of the average listener and the U.S. culture as a whole have changed rather drastically.

Note the conclusion is not simply that the average listener prefers harmonic simplicity and the critical listener prefers harmonic complexity, which is perhaps a common belief among both the general public and musicians. Although the data from the last three years of music releases may support such a conclusion, the larger sample size from this study counsels caution. In fact, based on the overall observed decrease of the usage of compositional tools such as added-chord tones and syncopation within a harmonic structure from the 1977-1979 data sets to the 2017-2019 data sets, one can generally conclude that harmonic complexity has decreased across the board in favored songs over time, regardless of the type of listener.

A separate detail found in this data that debunks today's common belief that harmonic simplicity and harmonic complexity correspond respectively to the average listener's and critical listener's desires is that, by nearly all metrics analyzed in this study, the commercially successful music from 1977-1979 was noticeably more harmonically complex than the critically-acclaimed music from the same years. This observation can also be verified through historical anecdote. In the late 1970s, bands such as the Sex Pistols and the Clash, with songs in the 1977-1979 critically-acclaimed data set, attempted to simplify rock "to its core ingredients: loud guitars, rude attitude, and enraged singing" in response to what they perceived as pretentious "hippie" bands [49]. Known as a leader in this movement of musical simplification, the Sex Pistols are remembered for flaunting "their ineptitude as musicians, making noises that were louder, faster, and noisier than anything most audiences had heard previously" in an effort to "denounce 1970s progressive rock and its extended structures as the product of culture industry largesse" [50]. It is reasonable to believe that critics of the time became attached to these musical sentiments, admiring and applauding the new directions taken. Therefore, it may be more accurate to conclude that critical listeners tend to favor the presence of innovation and novelty within music more so than the average listener, rather than attempting to explain the divide as being a mere issue of musical complexity.

Future research in history, cultural theory, and an expanded data set would be needed to further explore the causes of this divergence in taste for harmonic complexities. Since music, like any cultural artifact, "is the result of a variational-selection process… a casual account of the evolution of music must contain an account of how musicians imitate, and modify, existing music when creating new songs, that is, an account of the mode of inheritance, the production of musical novelty, and its constraints" [51]. Future research may develop such an account by

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examining the evolution of the music industry's distribution avenues and the public's overall access to music. There may be notable connections between the way popular music is altogether experienced and its compositional structures. Also, what impact do newly developing avenues for commercial success have on the working music critic and the critic's role, if any, as an influential voice?

The advent of MTV in 1981 presents a compelling example. With MTV, Professor Steven Maxwell notes, "Popular music became more visual; dancing styles and clothing styles became increasingly more important…some bands that were less talented but had great visual appeal became more popular" [52]. New developments in the 21st century would also be of interest. One study suggests that "Now that the digital age is upon us and artists can use the internet resourcefully to gain attention for themselves, major labels invest to take that artist nationally and globally. Major labels invest more money into their artists' promotion depending on the popularity of that particular act" [53]. Might the rise in digital resourcefulness and transparency between a musician and their audience influence the way in which music is composed? Analyzing the effects that music distribution avenues have had on the musical structures of popular music may be one approach into explaining the differences in harmonic preferences between the critic and the public.

Another potential explanation and area of research may lie within the evolution of musical functions over time. The way in which music is used with regard to social identity, ritual, and entertainment, among others, is deeply rooted within one's culture and could explain structural differences in popular music between eras. One such study by musicologist Nolan Gasser finds a connection between musical function and musical structure. As Gasser states, "Many distinctly musicological and experiential dimensions of a song or work - its tempo, mode, melodic style, etc. - are explicit reflections of its original function; as such, it will often share those musicological dimensions with other songs/works aligned with that same function, even those found in other musical cultures" [54]. Examining the continuously changing way in which music serves our daily lives could help explain the statistical fluctuation found in the uses of harmonic complexities over time.

Undoubtedly, the most important next step for the future of this study is to expand the data sets and include a broader range of songs in the analysis. While this particular analysis was done by hand, such an expansion would likely require the use of automation, which to our fortune is an available and growing method of music analysis today. Open-source tools such as Sonic Visualizer [55], Humdrum [56], or Music21 [57] could aid in the process of harmonic analysis and trend identification. Analyzing the structures beyond harmonic complexities would be obligatory as well, and these same tools could be of assistance. Aspects such as melodic range, melodic intervals, rhythm, instrumentation, dynamics, form, and others could all be further analyzed. Several studies have accomplished similar undertakings, notably Mauch, MacCallum, Levy, & Leroi's publication "The Evolution of Popular Music: USA 1960-2010" [51], which analyzed eight different facets of both harmonic language (specifically chord changes) and timbral properties from approximately 17,000 songs that have appeared on

the Billboard Hot 100 list over a span of fifty years. Extending this data set into songs that were widely acclaimed by professional critics would certainly bring us closer to the questions looked into through this study.

Culturally observed and statistically demonstrated, there exists a divide in the modern world between the music favored by professional critics and the music favored culturally. Although only a specific detail was measured here, it demonstrates such a divide. If certain trends continue, will this divide in musical taste become even greater? Would the art of music grow and continue to inspire with this existing disparity? As an isolated question, yes. There is nothing innately wrong with differing musical opinion. It almost goes without saying that the presence of a variety of musical desires among listeners is healthy for the music world. It may become problematic, though, when music lovers of all kinds stop listening to each other. If music consumers completely ignore those with different backgrounds, education, and developed taste, the music world suffers, shrinking into small pockets of exclusivity instead of expanding outward. While it is important for different opinions to exist, there is room to improve the relationships between different types of listeners by giving appropriate space for those opinions to be heard and accepting that there are endless possibilities within the art of music. Both the music connoisseur with years of professional experience and the typical music festival attendee play an important part in shaping the future of music; their coexistence and cooperative interaction is essential.

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Appendix

Song	Artist/Band	# of Unique Progressions	Primary Harmony %	Other Diatonic Harmony %	Non-Diatonic Harmony %	Non-Chord Tone Usage %	Syncopation Usage %	# of Key Changes
1977-1979 Popular Songs								
"Tonight's the Night (Gonna Be Alright)"	Rod Stewart	3	74%	22%	4%	0%	8%	0
"I Just Want to Be Your Everything"	Andy Gibb	4	46%	28%	26%	100%	33%	0
"Best of My Love"	The Emotions	2	60%	33%	7%	0%	0%	0
"Evergreen"	Barbra Streisand	8	44%	32%	24%	100%	0%	0
"Angel in Your Arms"	Hot	4	55%	45%	0%	57%	0%	1
"I Like Dreamin'"	Kenny Nolan	9	45%	54%	1%	77%	6%	3
"Don't Leave Me This Way"	Thelma Houston	5	44%	20%	36%	0%	0%	4
"(Your Love Has Lifted Me) Higher and Higher"	Rita Coolidge	4	36%	32%	32%	100%	0%	2
"Undercover Angel"	Alan O'Day	8	62%	13%	25%	10%	50%	1
"Torn Between Two Lovers"	Mary MacGregor	6	49%	38%	13%	0%	0%	0
"Shadow Dancing"	Andy Gibb	4	60%	20%	20%	27%	27%	0
"Night Fever"	Bee Gees	6	51%	40%	9%	7%	0%	4
"You Light Up My Life"	Debby Boone	8	39%	31%	30%	0%	0%	3
"Stayin' Alive"	Bee Gees	5	45%	22%	33%	0%	0%	0
"Kiss You All Over"	Exile	4	89%	11%	0%	20%	0%	0
"How Deep Is Your Love"	Bee Gees	6	39%	25%	36%	68%	0%	0
"Baby Come Back"	Player	7	28%	36%	36%	100%	54%	2
"(Love Is) Thicker Than Water"	Andy Gibb	5	42%	40%	18%	100%	44%	0
"Boogie Oogie Oogie"	A Taste of Honey	3	50%	42%	8%	100%	33%	0
"Three Times a Lady"	Commodores	5	70%	17%	13%	33%	0%	0

Song	Artist/Band	# of Unique Progressions	Primary Harmony %	Other Diatonic Harmony %	Non-Diatonic Harmony %	Non-Chord Tone Usage %	Syncopation Usage %	# of Key Changes
"My Sharona"	The Knack	4	63%	0%	37%	0%	50%	2
"Bad Girls"	Donna Summer	3	53%	14%	33%	100%	100%	0
"Le Freak"	Chic	2	41%	18%	41%	33%	0%	0
"Da Ya Think I'm Sexy?"	Rod Stewart	5	38%	58%	4%	45%	0%	0
"Reunited"	Peaches & Herb	2	30%	32%	38%	100%	100%	2
"I Will Survive"	Gloria Gaynor	1	43%	43%	14%	100%	0%	0
"Hot Stuff"	Donna Summer	4	81%	19%	0%	0%	25%	0
"Y.M.C.A."	Village People	3	68%	32%	0%	45%	27%	0
"Ring My Bell"	Anita Ward	1	100%	0%	0%	100%	0%	0
"Sad Eyes"	Robert John	3	72%	28%	0%	100%	0%	1
<u>1977-1979 Acclaimed Songs</u>								
"The Chain"	Fleetwood Mac	4	43%	48%	9%	0%	33%	0
"Peg"	Steely Dan	8	55%	14%	31%	100%	100%	0
"Sound and Vision"	David Bowie	3	56%	44%	0%	0%	33%	0
"Marquee Moon"	Television	4	37%	26%	37%	33%	58%	0
"God Save the Queen"	Sex Pistols	5	91%	9%	0%	0%	100%	6
"White Riot"	The Clash	4	83%	17%	0%	0%	0%	4
"Trans-Europa Express"	Kraftwerk	2	100%	0%	0%	55%	0%	8
"Heroes"	David Bowie	3	59%	10%	31%	0%	0%	0
"Alison"	Elvis Costello	5	57%	34%	9%	0%	23%	0
"Three Little Birds"	Bob Marley	2	100%	0%	0%	0%	0%	0
"Badlands"	Bruce Springsteen	3	88%	12%	0%	0%	30%	0
"Pump It Up"	Elvis Costello	3	70%	0%	30%	100%	30%	0
"The Big Country"	Talking Heads	3	82%	7%	11%	25%	75%	5
"One Way or Another"	Blondie	6	43%	27%	30%	0%	0%	2

Song	Artist/Band	# of Unique Progressions	Primary Harmony %	Other Diatonic Harmony %	Non-Diatonic Harmony %	Non-Chord Tone Usage %	Syncopation Usage %	# of Key Changes
"Beast of Burden"	The Rolling Stones	2	79%	21%	0%	66%	100%	0
"Runnin' With the Devil"	Van Halen	3	33%	9%	58%	0%	82%	10
"Holocaust"	Big Star	4	58%	42%	0%	0%	0%	0
"I Love the Sound of Breaking Glass"	Nick Lowe	2	75%	25%	0%	0%	50%	0
"2/1"	Brian Eno	n/a	25%	50%	25%	0%	0%	0
"English Rose"	The Jam	2	67%	0%	33%	0%	0%	1
"London Calling"	The Clash	3	36%	41%	23%	25%	38%	0
"Don't Stop 'Til You Get Enough"	Michael Jackson	2	53%	0%	47%	100%	57%	0
"Heaven"	Talking Heads	2	50%	25%	25%	0%	50%	0
"Refugee"	Tom Petty	3	67%	24%	9%	0%	67%	0
"Disorder"	Joy Division	4	72%	28%	0%	43%	0%	0
"Poptones"	Public Image Ltd.	1	50%	50%	0%	100%	0%	0
"Oliver's Army"	Elvis Costello	4	72%	15%	13%	0%	0%	1
"Damaged Goods"	Gang of Four	3	70%	30%	0%	100%	0%	0
"Is She Really Going Out With Him?"	Joe Jackson	4	66%	17%	17%	8%	50%	0
"Comfortably Numb"	Pink Floyd	4	66%	17%	17%	0%	0%	4
2017-2019 Popular Songs								
"Shape of You"	Ed Sheeran	1	50%	50%	0%	0%	0%	0
"Despacito (Remix)"	Luis Fonsi and Daddy Yankee feat. Justin Bieber	1	75%	25%	0%	0%	0%	0
"That's What I Like"	Bruno Mars	4	29%	66%	5%	100%	100%	0
"Humble"	Kendrick Lamar	1	100%	0%	0%	0%	0%	0
"Something Just Like This"	The Chainsmokers and Coldplay	2	71%	29%	0%	0%	86%	0

Song	Artist/Band	# of Unique Progressions	Primary Harmony %	Other Diatonic Harmony %	Non-Diatonic Harmony %	Non-Chord Tone Usage %	Syncopation Usage %	# of Key Changes
"Bad and Boujee"	Migos feat. Lil Uzi Vert	2	67%	0%	33%	0%	0%	0
"Body Like a Back Road"	Sam Hunt	2	83%	17%	0%	0%	100%	0
"Closer"	The Chainsmokers feat. Halsey	1	67%	33%	0%	0%	100%	0
"Believer"	Imagine Dragons	1	33%	67%	0%	0%	0%	0
"Congratulations"	Post Malone feat. Quavo	1	100%	0%	0%	0%	0%	0
"God's Plan"	Drake	1	50%	50%	0%	100%	0%	0
"Perfect"	Ed Sheeran	3	75%	25%	0%	0%	0%	0
"Meant to Be"	Bebe Rexha feat. Florida Georgia Line	2	63%	37%	0%	0%	100%	0
"Havana"	Camila Cabello feat. Young Thug	1	67%	33%	0%	0%	100%	0
"Rockstar"	Post Malone feat. 21 Savage	3	82%	18%	0%	0%	0%	0
"Psycho"	Post Malone feat. Ty Dolla Sign	1	100%	0%	0%	0%	0%	0
"I Like It"	Cardi B, Bad Bunny and J Balvin	2	60%	4%	36%	100%	88%	0
"The Middle"	Zedd, Maren Morris and Grey	3	83%	17%	0%	0%	39%	0
"In My Feelings"	Drake	1	50%	50%	0%	100%	100%	0
"Girls Like You"	Maroon 5 feat. Cardi B	1	75%	25%	0%	0%	0%	0
"Old Town Road"	Lil Nas X feat. Billy Ray Cyrus	1	25%	0%	75%	100%	0%	0
"Sunflower"	Post Malone and Swae Lee	1	67%	33%	0%	0%	0%	0
"Without Me"	Halsey	2	63%	37%	0%	0%	100%	0
"Wow"	Post Malone	1	100%	0%	0%	0%	100%	0
"Happier"	Marshmello and Bastille	2	75%	25%	0%	0%	0%	0

Song	Artist/Band	# of Unique Progressions	Primary Harmony %	Other Diatonic Harmony %	Non-Diatonic Harmony %	Non-Chord Tone Usage %	Syncopation Usage %	# of Key Changes
"Bad Guy"	Billie Eilish	1	100%	0%	0%	0%	0%	0
"7 Rings"	Ariana Grande	1	75%	25%	0%	0%	0%	0
"Talk"	Khalid	1	33%	67%	0%	100%	100%	0
"Sicko Mode"	Travis Scott	3	78%	11%	11%	40%	40%	2
"Sucker"	Jonas Brothers	2	43%	47%	10%	0%	57%	0
2017-2019 Acclaimed Songs								
"Humble"	Kendrick Lamar	1	100%	0%	0%	0%	0%	0
"Green Light"	Lorde	3	67%	13%	20%	50%	33%	0
"oh baby"	LCD Soundsystem	2	78%	22%	0%	0%	100%	0
"Los Ageless"	St. Vincent	3	47%	15%	38%	0%	0%	0
"Big Fish"	Vince Staples	1	75%	25%	0%	0%	100%	0
"Holding On"	The War On Drugs	4	54%	46%	0%	0%	10%	0
"The System Only Dreams in Total Darkness"	The National	3	63%	37%	0%	0%	0%	0
"Sugar for the Pill"	Slowdive	4	61%	39%	0%	0%	0%	0
"The Weekend"	SZA	4	45%	4%	51%	78%	22%	0
"Real Death"	Mount Eerie	9	74%	26%	0%	0%	0%	0
"Self"	Noname	2	17%	17%	66%	100%	100%	0
"Missing U"	Robyn	3	81%	19%	0%	0%	14%	0
"Make Me Feel"	Janelle Monae	3	80%	12%	8%	70%	0%	0
"Danny Nedelko"	Joy	4	72%	21%	7%	0%	0%	0
"Nobody"	Mitski	7	63%	37%	0%	100%	0%	2
"Shattered Dreams"	Earl Sweatshirt	1	100%	0%	0%	100%	100%	0
"Butterflies"	Kacey Musgraves	5	47%	53%	0%	0%	0%	0
"The walker"	Christine and the Queens	1	75%	25%	0%	0%	100%	0

Song	Artist/Band	# of Unique Progressions	Primary Harmony %	Other Diatonic Harmony %	Non-Diatonic Harmony %	Non-Chord Tone Usage %	Syncopation Usage %	# of Key Changes
"Bodys"	Car Seat Headrest	6	68%	29%	3%	0%	30%	0
"Static Resistance"	Hookworms	3	56%	25%	19%	43%	0%	0
"Bright Horses"	Nick Cave & the Bad Seeds	2	70%	30%	0%	0%	33%	0
"All Mirrors"	Angel Olsen	4	35%	8%	57%	0%	0%	2
"Andromeda"	Weyes Blood	8	43%	33%	24%	0%	0%	6
"Selfish"	Little Simz	1	50%	50%	0%	100%	100%	0
"You Ain't the Problem"	Michael Kiwanuka	4	33%	39%	28%	0%	0%	4
"home with you"	FKA twigs	4	63%	27%	10%	0%	25%	0
"Mariners Apartment Complex"	Lana Del Rey	2	67%	0%	33%	17%	0%	0
"Boys in the Better Land"	Fontaines D.C.	2	78%	0%	22%	0%	0%	0
"All My Happiness is Gone"	Purple Mountains	1	100%	0%	0%	60%	0%	0
"Comeback Kid"	Sharon Van Etten	5	64%	14%	22%	0%	89%	3