

Is the I–V–vi–IV Chord Progression Becoming Less Popular?

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Introduction

Our group has elected to determine whether or not the I-V-vi-IV chord progression is falling out of favor within post-millennial popular music. More specifically, our hypothesis is that the ratio of I-V-vi-IV quadgrams, or any of its rotations, in a dataset of songs in the Billboard Hot-100, will trend downward from 2016 to 2022.

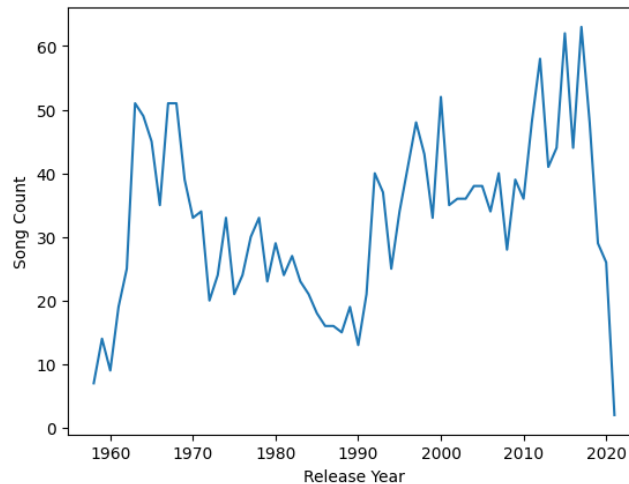
YouTube personality, musician, educator, and producer Rick Beato, on Sean Carroll's Mindscape podcast, mentioned the idea that the I-V-vi-IV progression (and any combination or permutation of said chords) have "ruined pop music" [1]. His explanation was that, from the late '90s to about 2017/2018, record label executives felt that songs did not sound like singles unless some permutation of the I-V-vi-IV progression was utilized. Within that claim is the idea that from 2017 onward, the use of the I IV V and vi chords has declined (which is what we've decided to base our hypothesis on). According to the Pew Research Center, anyone born within the years 1981 and 1996 is considered a millennial; two thirds of our research group are considered to be millennials and, consequently, have grown up in an era where the I, IV, V and vi chords have reigned supreme (according to Rick Beato, of course). Although we may not necessarily know how or why these chords became so popular, it is quite interesting to be alive during a time where a progression once synonymous to popular music has [potentially] begun to lose its popularity.

Upon examining our claim that the I, IV, V and vi chords have declined in popularity from 2016 to 2022, we thought it appropriate to operationalize what we mean when we refer to the I-V-vi-IV progression. Rick Beato never mentioned a specific progression. Rather, he simply mentioned the I, IV, V and vi chords and made it a point to note that he's referring to any permutation of those four chords. To make the hypothesis more concrete, as well as align more closely with the way the phenomenon of the I-V-vi-IV progression in pop music is referred to elsewhere (such as Wikipedia [2]), we've elected to consider the I-V-vi-IV progression, along with its "rotations". For our purposes, a rotation of the I-V-vi-IV progression is an iteration of the progression that may begin on I, V, vi, or IV (as long as the rest of the progression follows the specified order. I.e. if starting on the V, the rotated progression would be V-vi-IV-I. Therefore, in order to prove our claim, we intend to search for the following progressions:

- I-V-vi-IV
- V-vi-IV-I
- vi-IV-I-V
- IV-I-V-vi

Data Description

We plan to use the “alternative measures” dataset created by Beach Clark [3]. The dataset contains 668,470 chord slices and 176,345 chord progressions extracted from 2,090 unique songs ranging from 1958 to 2021.



The plot above shows the distribution of release year of the songs in the dataset. We can see that it is unbalanced; the number of songs from 1973 to 1990 is about half of the number in other years, and there is a sharp decline in song count starting in 2018.

The dataset labeling is also a bit messy. The release years of 44 songs are labeled as 0, and 15 songs have an empty release year. We have fixed this by hand-annotating these missing labels. The chord labeling is obtained either from the McGill Billboard Project or Chordify, with the former being an expert annotated dataset and the latter being a crowd sourced website. This may indicate that the chord labels are drawn from a different distribution. The artist selection of the dataset is also quite unbalanced, with 178 of the 2,090 songs from the Beatles and 75 from Imagine Dragons. Billboard ranking labels are not provided, but this can be easily obtained from the Billboard website.

Since there are few songs in our dataset from 2018 onward, and the claim we’re investigating extends to years after 2018, we will additionally use the same methods that Beach Clark used to gather more recent popular song chord data. We will scrape Billboard Hot-100 charts for song rank, artist and song title, and Chordify for chord data corresponding to the songs.

Analysis Plan

For each year of chord data in our corpus, we will first find every non-overlapping chord quadgram, or contiguous sequence of four chords. This will represent our sample population. We will find the ratio of I-V-vi-IV quadgrams (with rotations) relative to all quadgrams within each year. We will examine this sequence of ratios for each year, and determine whether there is a downward trend in the range 2016-2022 (or the most recent year for which we are able to acquire sufficient chord data).

We have not finalized our methodology for statistically determining whether a downward trend is present in the recent period. Most likely, we will use a method such as least squares

to fit a line to the data over the period, and determine whether the line has a negative slope, using a goodness-of-fit metrics such as R-squared to determine if a linear model is appropriate. There will be at most six data points to in our downward-trend test, so even simpler methods, like counting the number of decreasing intervals out of the six, may also be appropriate.

We will use tools in the Python ecosystem (such as BeautifulSoup) for web scraping of Billboard Hot-100 charts and Chordify.net chord data, and will use Music21 to work with the chord data.

Project Timeline

We provide a graphical project timeline below:

	2022-10-10	2022-10-17	2022-10-24	2022-10-31	2022-11-07	2022-11-14	2022-11-21	2022-11-28	2022-12-05	2022-12-09
Corpus pre-processing and cleaning										
Reading in the data and unifying the corpus										
Coding the analysis										
Initial/basic graphing of analytical outcomes										
Setting up data for testing										
Performing statistical tests										
Final graphs/tweaking/clean up										
Writing final paper										
Final presentation										

- [1] <https://www.preposterousuniverse.com/podcast/2022/08/22/208-rick-beato-on-the-theory-of-popular-music/>
- [2] https://en.wikipedia.org/wiki/I%E2%80%93V%E2%80%93vi%E2%80%93IV_progression
- [3] https://www.smc2019.uma.es/articles/S6/S6_05_SMC2019_paper.pdf