

Final Project: Billboard Top 5 Hits Through The Years: Are Songs Getting Simpler?

Name: Wilson Fredbeck

Date: 12/10/2025

Final Infographic

```
In [3]: from IPython.display import Image, display  
display(Image(filename='final-infographic.png'))
```

Billboard Top 5 Hits Through The Years: ARE SONGS GETTING SIMPLER?

WILSON FREDBECK

ABOUT THE DATASET

This project utilizes the Billboard Melodic Music Dataset (BiMMuDa), a dataset of the Top 5 Billboard Year-End singles from 1950 to 2022. Unlike purely audio-based datasets, BiMMuDa features expert manual transcriptions of lead vocal melodies, offering very accurate data. The dataset dissects 370+ hit songs into over 1,100 structural sections (verses, choruses, bridges), providing data on pitch variability, rhythmic density, and lyrical content.



ARE SONG LYRICS GETTING MORE OR LESS COMPLEX?

We can see an interesting paradox in trends, as the words per song actually increase as the years continue, as we see in Figure 1, suggesting that songs could be growing more complex over time in regards to word count.



Alternatively, The Lyrical Complexity (Unique Word Ratio) to the right argues that vocabulary diversity has dropped. Modern songs use more words but repeat them more often. This aligns with the rise of Hip-Hop, prioritizing rhythmic hooks over linear storytelling.

Fig. 1

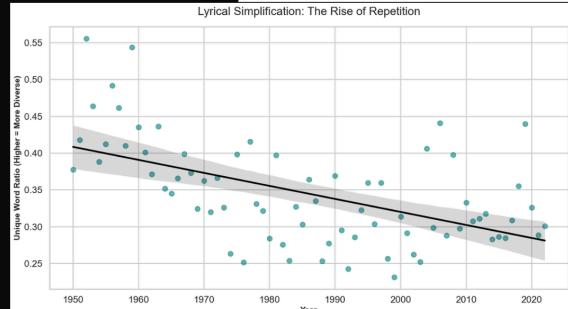
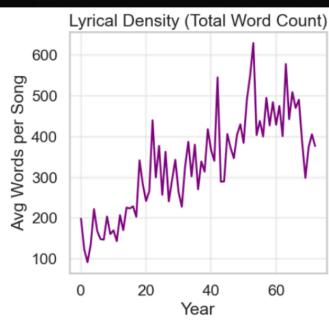


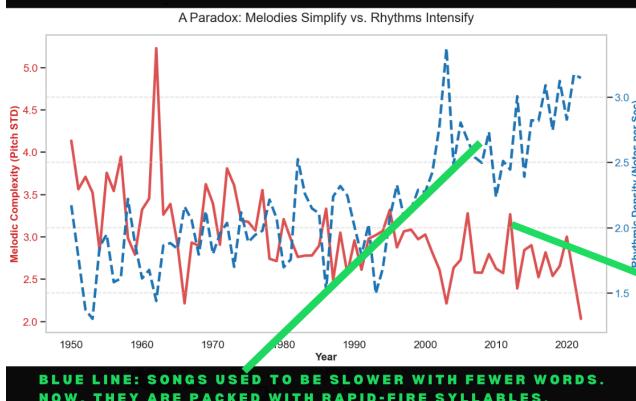
Fig. 2

THE CHANGE OF MELODY VS RHYTHMS

The chart illustrates a fundamental evolution in pop songwriting. As the graph shows, traditional melodic complexity (Red) has steadily given way to rhythmic density (Blue).

Fig. 3

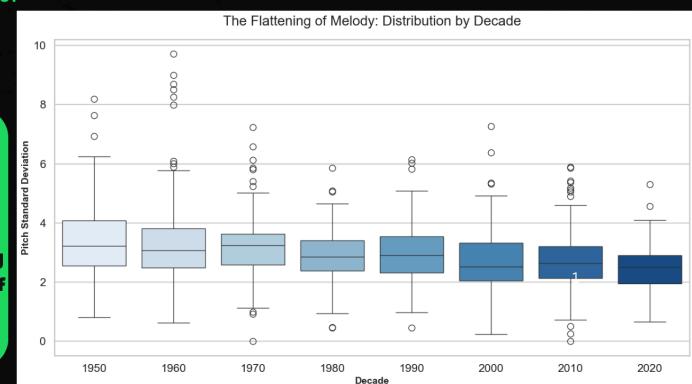
RED LINE : SONGS USED TO HAVE BIG JUMPS IN PITCH. NOW, MELODIES ARE FLATTER AND STAY ON JUST A FEW NOTES.



BLUE LINE: SONGS USED TO BE SLOWER WITH FEWER WORDS. NOW, THEY ARE PACKED WITH RAPID-FIRE SYLLABLES.

THE COOKIE CUTTER ARGUMENT

This box plot reveals a hidden trend: pop music is becoming homogenized. In the 1950s, the charts featured a wide variety of melodic styles (tall boxes). By the 2020s, that range has collapsed. The shorter boxes of the modern era prove that to be a hit today, a song must fit into a very strict, narrow definition of simplicity. Melodic outliers have effectively vanished.



Description of the Final Project

Billboard Top 5 Hits Through The Years: Are Songs Getting Simpler? is a data visualization infographic that investigates the evolution of musical complexity in the Billboard Year-End Top 5 from 1950 to 2022.

The Core Narrative: Common wisdom suggests that pop music is "getting dumber." This project uses the BiMMuDa dataset to test that hypothesis. The analysis reveals a complex trade-off: while **Melodic Complexity** (Pitch STD) has declined by nearly 40%, **Rhythmic Density** (Notes per second) has doubled. This creates the paradox that music hasn't just simplified; it has shifted its focus from melody to rhythm, largely driven by the rise of Hip-Hop in the 1990s. Additionally, there are now more words in songs, but the **Unique Word Ratio** shows that while this may be true, songs have become more repetitive and less complex.

Key Visualizations:

1. **Lyrical Simplification (Scatter Plot):** Demonstrates the statistical decline in unique vocabulary usage.
2. **Meodies Simplify, Rhythms Get More Complex (Dual-Axis Chart):** Visualizes the historical intersection where rhythm overtook melody (c. 1990).
3. **The Cookie Cutter Argument (Box Plot):** Illustrates how the "range" of acceptable melodic complexity has shrunk over time.

Project Manifest

Resource Name	Type	Description	Link/Source
bimmuda_per_song_full.csv	Data File	The primary dataset containing metadata (Artist, Title, Year) and lyrical stats for Top 5 hits.	BiMMuDa Dataset
bimmuda_per_melody_full.csv	Data File	The granular dataset containing melodic features (Pitch STD, Onset Density) for individual song sections.	BiMMuDa Dataset
N1-data-info.ipynb	Jupyter Notebook	Data Preparation: Handles data loading, merging, and cleaning of the two CSV files.	Local File
N2-data-exploration.ipynb	Jupyter Notebook	Exploratory Analysis: Contains initial histograms, hypothesis testing, and generation of all analysis plots.	Local File
N3-final-product.ipynb	Jupyter Notebook	Final Product: The presentation layer displaying	Local File

Resource Name	Type	Description	Link/Source
		the final infographic and project summary.	
final-infographic.png	Image File	The final infographic in PNG format.	Local File
Storyboard Photos	Image Files	Photos of the paper prototyping/storyboarding process.	Local Folder
Canva	Design Tool	Used to assemble the Python-generated plots into the final poster layout.	Canva.com
Hamilton et al. (2024)	Academic Paper	"BiMMuDa: The Billboard Melodic Music Dataset" (Source of the data methodology).	Paper Link