Analyzing Sentiment in Song Lyrics: A Decade of Music Trends (2010-2020)

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Abstract

This text mining study delves into the emotional dynamics and trends in music over a decade (2010-2020) by conducting a sentiment analysis of song lyrics from Spotify's top 25 hits. Utilizing a robust dataset, this research identifies the most prevalent words and phrases in lyrics, exploring their evolution and significance across different genres and years. A distinctive focus is placed on the impact of the COVID-19 pandemic on lyrical content in 2020. By employing text mining and sentiment analysis techniques, we seek to uncover the emotional tone of these songs, providing insights into the evolution of sentiment in popular music over the decade. By quantifying the emotional content of lyrics, the study offers a novel perspective for music enthusiasts, assists the music industry in understanding trends, and examines the potential influence of global events on the emotional resonance of music.

Keywords: Sentiment Analysis, Song lyrics, Music Trends, COVID-19, Text Mining

1. Introduction

Music has always been a mirror, reflecting society's emotions, thoughts, and sentiments. The songs we listen to often encapsulate the prevailing mood of a time or the spirit of an era. In modern music, lyrics act as windows into our collective consciousness, revealing societal norms, cultural shifts, and emotional undercurrents. The last decade has witnessed significant transformations in the music industry, including shifts in genres and the emotions expressed in popular songs. The emergence of digital platforms like Spotify has made the analysis of music preferences and trends more accessible and data-driven than ever. This study springs from a desire to delve deeper into the music of this period, focusing on genre trends and the sentiments conveyed in these songs.

The years from 2010 to 2020 represent a transformative period in the music landscape, marked by shift in genres, the rise of streaming platforms, and the unprecedented challenges posed by the COVID-19 pandemic. As people's lives evolved and adapted during these years, so did their music preferences and the emotions they sought to express and connect with through music. Music, as an art form, is both reflective and influential – it mirrors societal moods and can also shape them. By examining the emotional content of lyrics, we gain insight into how public sentiment has evolved over time and how major events like the pandemic have impacted collective emotionality.

The primary objective of this research is to conduct a comprehensive sentiment analysis of the top 25 hit songs on Spotify from each year between 2010-2020. Understanding the sentiment expressed in song lyrics can be an asset to both music enthusiasts and the music industry. In this exploration, we aim to uncover the predominant emotional themes and trends in music over this decade, thereby providing a lens through which to view the evolving cultural and societal landscape. Leveraging text mining techniques, we will extract insights from this dataset and delve into sentiment analysis applied to song lyrics. Our specific goals are to:

1. Understand the prevailing emotional themes in song lyrics over the past decade and identify any significant shifts or patterns.
2. Explore how sentiment varies across different music genres, shedding light on genre-specific emotional expressions.
3. Investigate whether COVID-19 had discernible effects on the emotional content of songs, considering the potential influence of societal events on music sentiments.

In essence, this study aims to uncover and quantify the emotional content of these song lyrics and explore how it has changed over time, across different music genres and years, and potentially in response to significant societal events like the COVID-19 pandemic.

2. Literature Review

The research article "Popular music lyrics and the COVID-19 pandemic" [1], sheds light on how cultural

artifacts, particularly music lyrics, have been influenced by socioeconomic conditions. Researchers have consistently shown a link between historical events and shifts in the lyrical themes and emotional content of popular songs. During times of adversity, such as COVID pandemic, music lyrics tend to reflect greater social isolation, emotional strain, and lower satisfaction, as evidenced by analyses of popular songs in both United Kingdom and the United States. Additionally, this research indicates that the valence of song lyrics, representing their emotional tone, can be influenced by socioeconomic hardship, with a marked increase in negatively valanced words and a decrease in positively valanced words during economically challenging periods. The impact of major global events on song composition, cross-cultural differences in lyrical themes, and alternative approaches to lyrical analysis are all recognized as crucial avenues for further investigation. By examining our data, this text mining project aims to delve into the sentiment analysis of lyrics and expand our understanding of how socioeconomic conditions have shaped music lyrics over this specific decade.

In another article from the National Library of Medicine [2], it discusses a study that investigates the relationship between lyrics and perceived emotions in Chinese songs. This study demonstrated that melody and lyrics can independently influence music emotion perception, but the integration of both components enhances the emotional impact. Lyrics, while overshadowed by melody in conveying emotions, have been found to play a significant role. Using linguistic analysis and word count technology, the researchers extracted lyric features from 2,372 Chinese songs. They explored how these lyrics influence the perceived arousal and valence of the music. The study found correlations between lyric features and perceived valence of the music. Additionally, the researchers had built music emotion recognition models using both audio and lyric features as inputs. The models showed that lyric features significantly improved the prediction of perceived valence. Several specific lyric features, like the frequency of words related to sadness and positive emotions, were important for valence recognition. This research sheds light on the role of lyrics in conveying emotions in music.

Furthermore, a study conducted by data scientists at Lawrence Technological University [3] in Michigan, they analyzed popular music lyrics from 1950s to 2016. The research found that over time, popular music lyrics have become angrier and sadder, with a decrease in the expression of joy. The study examined over 6,000 songs from the Billboard Hot 100 each year, using automatic quantitative sentiment analysis to measure the sentiments expressed in lyrics. The analysis revealed a gradual increase in anger, sadness, disgust, and fear in lyrics, with some variations in different time periods. Joy was dominant in lyrics during the 1950s but decreased over the years, except for a sharp increase in the mid-1970s. The study suggests that changes in lyrics reflect shifts in music consumer preferences rather that musicians' intentions, demonstrating how emotions in lyrics have adapted to meet the emotional demands of the audience.

By delving into the emotional trends within lyrics from our data in the past decade, our project seeks to complement this existing research by analyzing contemporary sentiments, providing a more recent snapshot of emotional dynamics in popular music.

3. Conceptual Framework

The conceptual framework of our study revolves around the intricate relationship between music, sentiment analysis, and societal trends. Drawing from the literature review, we recognize sentiment analysis as a crucial tool in decoding the emotional content of song lyrics. Based on the article "Popular music lyrics and the COVID-19 pandemic" [1], we acknowledge the significant impact of socioeconomic conditions on the emotional tone of song lyrics. This study suggests a direct correlation between historical events, such as COVID-19 pandemic, and shifts in lyrical themes. Our framework, therefore, includes the examination of how global events have influenced the sentiment in song lyrics over the decade. The research from the National Library of Medicine [2] highlights the relationship between lyrics, melody, and the emotional impact of music. Our framework incorporates this understanding by examining not only the lyrics but also how they interact with musical features like energy, danceability, and valence to influence the overall sentiment of the song. The study from Lawrence Technological University [3] indicates a historical shift in the sentiment of song lyrics, with a trend towards more negative emotions over time. Our framework involves analyzing temporal changes in sentiment within our specific decade, contributing to this broader narrative of evolving emotional expressions in music.

Our conceptual framework is designed to provide a comprehensive understanding of how sentiments in song lyrics from 2010 to 2020 evolve. By integrating insights from the literature and employing advanced analytical methods, our project aims to contribute to the ongoing discourse on the relationship between music, society, and emotion.

4. Research Questions

To demonstrate several key text mining techniques, we have the following research questions in this paper:

Inductive Research Questions:
RQ1: What are the patterns and trends in the usage of words and phrases in song lyrics from 2010 to 2020, and how to they vary across different genres?

RQ1.1: What are the most frequently used words in the song lyrics?

RQ1.2: What are the most important words used over the years and genres, including any "timeless words" that have remained consistently significant in song lyrics?

RQ1.3: What are the most common key phrases?

RQ2: Are there notable differences in usage of keywords/phrases in songs during the COVID-19 pandemic in 2020 and how does it compare to other years?

Deductive Research Questions:
RQ1: How does sentiment in song lyrics evolve across the decade (2010-2020), and what factors or words contribute to these sentiment changes?

RQ1.1: How does the sentiment of song lyrics correlate with variables like energy, danceability and valence scores of songs?

RQ1.2: With the help of pre-existing sentiment lexicons, how do sentiments in the song lyrics evolve across the decade?

RQ1.3: Are there any specific words that are strongly associated with positive or negative sentiment in the lyrics?

5. Methodology

5.1 Data Collection

We started by collecting our data from Kaggle.com, a popular platform for datasets. We focused on two primary datasets: 'Spotify 2010-2019 Top 100' and 'Spotify Top Hits 2020-2021'. To create a comprehensive dataset spanning the entire decade from 2010 to 2020, we merged these two datasets. Rather than analyzing the top 100 songs from each year, we narrowed our focus on the top 25 songs.

For the songs from 2010 to 2015, additional data were sourced from Kaggle, including the lyrics. This was merged with our existing dataset, using the unique song names as the primary key. Lyrics for the years beyond 2015 were obtained from Lyrics.com. After extensive data collection and merging, we consolidated this information into a single csv file, named 'Spotify 2010-2020 Top 25 Songs and Lyrics'. These attributes, ranging from the danceability (a measure of a song's suitability for dancing) to valence (a metric for the positivity or negativity of a song), formed the backbone of our analysis. The dataset included a total of 275 songs, each accompanied by its lyrics, serving as the foundation for our subsequent analyses.

5.2 Data Preparation

In preparing our dataset for sentiment analysis and text mining, we employed a systematic approach. The process began by loading all essential libraries in R, which are fundamental for data wrangling. These libraries included 'dplyr', 'tidyr', 'tm' and 'tidytext'. Then we carefully examined the dataset to identify and address any missing data or NA values, as these could potentially disrupt the analysis. Additionally, genre classifications were verified and corrected to maintain accuracy and consistency. Given the dataset's multilingual nature, translations were performed for songs not in English, such as Korean and Spanish, to create a more homogenous corpus for analysis.

The main step in this preparation phase was the construction of a text corpus, which essentially serves as a library of text documents, in this case, the song lyrics. For our exploratory research questions, which seek to explore patterns in song lyrics over time and across genres, we initially tokenized the lyrics. This means breaking down the text into individual words and phrases.

Data cleaning was then carried out to remove stop words, special characters, punctuations, numbers, and ensure uniform lowercase text. To ensure the quality and relevance of the text corpus, various transformations were applied to standardize language, including replacing contractions, handling informal languages and slang, and expanding abbreviations. Profanity and informal language were carefully addressed, ensuring a more professional and appropriate tone for analysis. In addition to cleaning special characters, a specific focus was placed on filtering out words that are often repeated in song lyrics but may not contribute significantly to the analysis. These words, sometimes referred to as "stop words", include terms like 'ooh', 'uh', 'oh', 'babe', 'yeah', baby', etc. The removal of these redundant words helped to create a more concise and meaningful dataset for sentiment analysis. To handle negation, phrases like "not happy" were transformed into "not_happy" to maintain their contextual value. We also addressed common contractions like "won't" and

"can't", expanding them to "will not" and "cannot". The resulting clean and processed data allowed us to conduct a word frequency analysis, revealing the most frequently occurring words in the lyrics. These meticulous data preparation steps were pivotal in extracting meaningful insights from the song lyrics, aiding our research in understanding prevalent themes or topics.

5.3 Text Mining Techniques and Approach

In this section, we outline our approach to analyzing song lyrics data from 2010 to 2020 using text mining techniques. We structure our approach around the research questions, emphasizing the specific steps and tools we will employ to extract valuable insights from the dataset.

To answer Inductive RQ1.1, we used Term Frequency Analysis (TF) to identify the most frequently used words in song lyrics. This involves tokenizing the lyrics into words and performing data cleaning (removing stop words, special characters punctuation). After tokenizing, we conduct frequency analysis, which involves counting how often each word appears across the dataset. The data is grouped by year to analyze term frequency within each year's context. For visual representation, we use a word cloud and bar plot. For Inductive RQ1.2, we utilize Term Frequency-Inverse Document Frequency (TF*IDF) analysis. TF*IDF helps us identify not only frequently used words but also words that are uniquely significant in certain years or genres. After the data wrangling, we group the data by year and genre, allowing for an exploration of word frequency trends within different contexts including different musical genres. We then calculate the TF*IDF scores for each word and phrase. These scores incorporate both the Term Frequency (TF) and the Inverse Document Frequency (IDF) across our dataset. We used bar plots to showcase the top words for each year and genre based on their TF-IDF scores. To address Inductive RQ1.3, we employ N-gram analysis. We explore various n-gram lengths such as bigrams and trigrams. N-grams are sequences of words of varying lengths, encompassing bigrams (two-word sequences) or trigrams (three-word sequences). We also filtered out bigrams and trigrams with the same word repetition. The top bigrams and trigrams are visualized using bar plots, showing the frequency of these phrases in the lyrics. For Inductive RQ2, we rely on Term Frequency-Inverse Document Frequency (TF*IDF) analysis. The process includes tokenization and data cleaning, with a specific separation of data into two periods: pre-COVID and the COVID year (2020) to allow for a direct comparison of word and phrase

usage before and during the pandemic. Then we calculate the TF*IDF scores for each word and phrase, with higher scores indicating more importance and uniqueness in the pre-Covid and COVID-19 years. These scores will consider both Term Frequency (TF) within each of the two time periods and the Inverse Document Frequency (IDF) across the entire dataset. We then compare the TF*IDF scores between 2020 and other years to identify words and phrases that significantly increased in importance during the COVID-19 pandemic. We visualized these comparisons through bar plots that highlighted the difference in the usage of keywords across the years.

To address Deductive RQ1.1, we conduct sub-group comparisons with key variables like 'dance', 'energy', and 'valence. We used 'AFINN' sentiment lexicon to assign sentiment scores to words in the lyrics. This helps in determining the overall sentiment of the songs. Then, we conducted a correlation analysis to explore the overall the relationship between lyric sentiments and musical features like energy, danceability, and valence. We used a correlation matrix to represent the relationships between sentiment scores and the song attributes. Deductive RQ1.2, we employ categorization models using "Bing" existing sentiment lexicon. These lexicons contain predefined lists of words and phrases pre-assigned sentiment scores, categorizing them as positive, negative, or neutral. The process of sentiment scoring involves the matching of words in the song lyrics with those in the sentiment lexicons and assigning sentiment labels accordingly. We used a line chart and bar plot to explore the sentiment distribution over the decade. To answer Deductive RQ1.3, we perform sentiment word extraction using "Bing" sentiment lexicon. This is similar like Deductive RQ1.2. We employ the "Bing" lexicons and categories words and phrases as positive, negative, and neutral. The sentiment word/phrase extraction process matches words and phrases in the song lyrics with those in the sentiment lexicon, assigning sentiment labels to each word based on their scores in the lexicon. Then, the sentiment labels are assigned to words and are aggregated to determine the overall sentiment of each song. We also found the top positive and negative songs in our dataset. Using the "NRC" lexicon, we also used a bar plot to find the top 5 words in each of its sentiment category.

In summary, our approach integrates various text mining techniques and visualizations to explore different aspects of song lyrics. From identifying prevalent words and phrases to understanding sentiment trends, each technique and visualization is tailored to address specific research questions,

providing a comprehensive analysis of the emotional landscape in popular music from 2010 to 2020.

6. Findings

Before diving into the core research questions, we conducted an initial visualization to identify the top eight words used in song lyrics for each year from 2010 to 2020, as shown in Figure 1. This visualization serves as a preliminary exploration of the lyrical content trends over the decade.
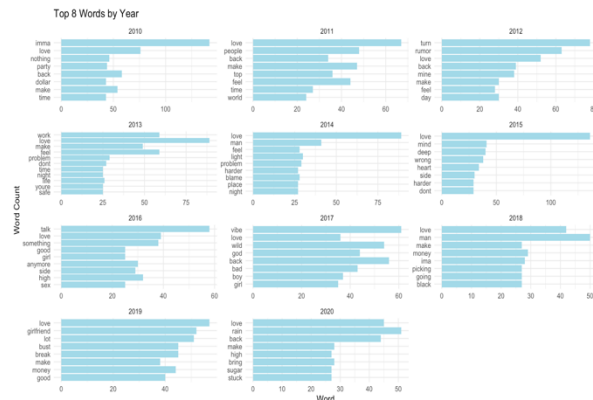

Figure 1. Top words per year.

One striking observation is the consistent presence of the word "love" across all years. This emphasizes the universal and timeless appeal of love as a theme in popular music. It suggests that regardless of changing trends and societal shifts, love remains a central topic in songwriting. The word "feel" also appears frequently in most years.

Next, to answer our inductive RQ1.1, "What are the most frequently used words in the song lyrics?", we used Term Frequency (TF) analysis. The bar plot, Figure 2, shows the top 20 most frequently used words in the song lyrics. Figure 3 is a word cloud of this visualization where the more frequency words are bigger in size. The word "love" appeared more than 700 times, significantly outnumbering other words. It looks like relationships and emotions are a common theme as words like "feel", "heart", "girl", and "man" indicate a strong focus on relationships and focus. There is also a theme of daily life and experiences with words such as "time", "night", "day", "life" and "call" point towards the representation of everyday experiences and moments.
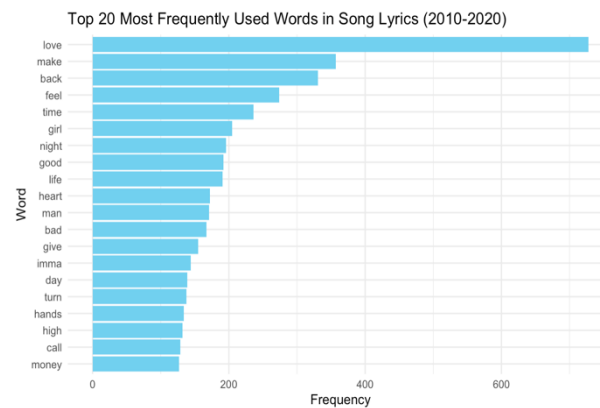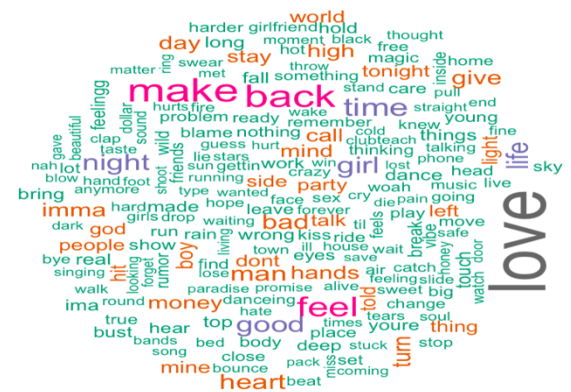

Figure 2. Top 20 most frequently used words.

Figure 3. Word cloud of frequently used words.

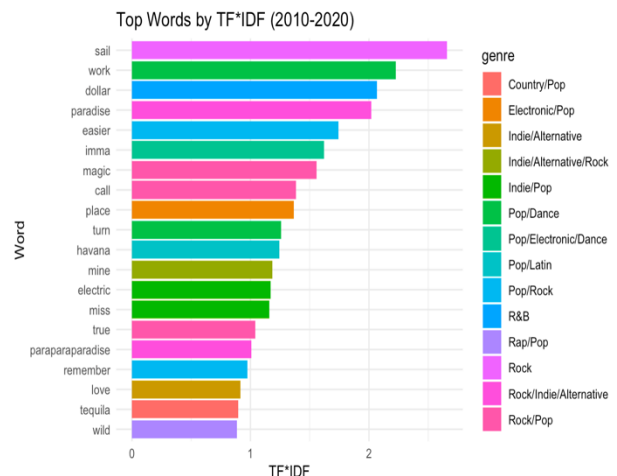To answer our inductive RQ1.2, "What are the most important words used over the years and genres,

Figure 4. Top Words by TF*IDF.

including any "timeless words" that have remained consistently significant in song lyrics?", we employed Term Frequency-Inverse Document Frequency

(TF*IDF) analysis, which sheds light on the important and timeless words in song lyrics. The visualization (Figure 4) shows words like "sail", "work" and "paradise" having high TF*IDF scores. These words are likely significant within their respective genres for that year. Words such as "Havana" and "tequila" reflect genre-specific influences, indicating the blending of cultural or regional elements into the lyrics. The variety in words across different genres and years highlights the dynamic nature of music.

Our analysis of "timeless words" (Figure 5) shows that they are consistently significant over the decade. The word "love" has the highest total TF*IDF score, reaffirming its universal appeal. Words like "back", time", "night", "feel", and "make" also feature prominently.
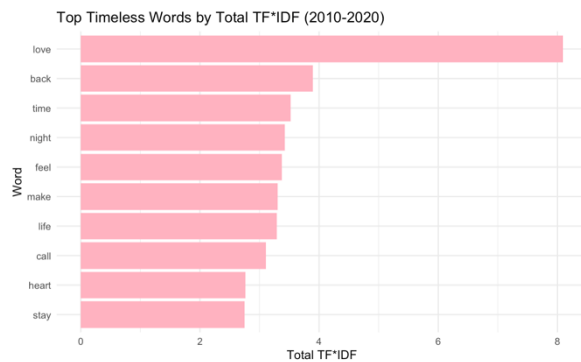
Figure 5. Timeless Words by Total TF*IDF.

These terms may represent enduing themes in music, such as reflections and emotional expressions.

To answer our inductive RQ1.3, "What are the most common key phrases in the lyrics?", we
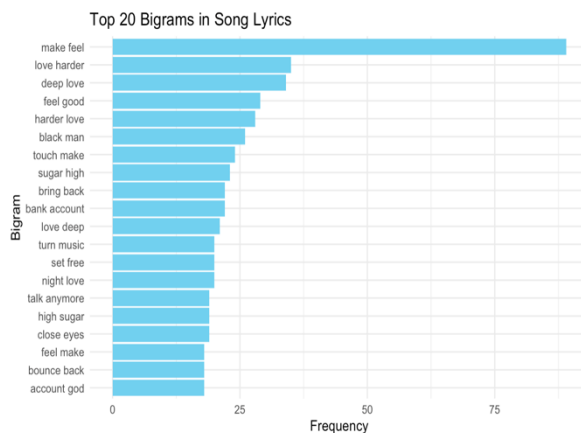

Figure 6. Top 20 Bigrams.

conducted an n-grams analysis, creating both bigrams (Figure 6) and trigrams (Figure 7). Looking at the bigrams, "make feel", "love harder", and "feel good"

indicate a strong focus on emotions and relationships in the lyrics. "Deep love" and "harder love" further underscore the depth and intensity of romantic themes
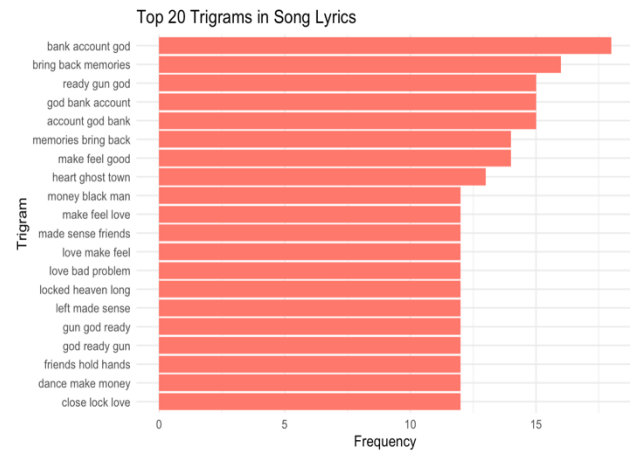

Figure 7. Top 20 Trigrams.

in music. Phrases like "black man" and "bank account" reflect cultural or societal elements.

Trigrams such as "bank account god", "bring back memories", and "ready gun god" could involve discussions of faith, wealth, memories, and possibly conflict or struggle. The n-gram analysis of song lyrics reveals a rich tapestry of themes and expressions. From emotional and relational elements to social commentary, these phrases offer insights into what resonates within popular music.

To answer our inductive RQ2, "Are there notable differences in usage of keywords/phrases in songs during the COVID-19 pandemic in 2020 and how does it compare to other years?", we split the data into two periods: pre-COVID and the COVID year (2020). We
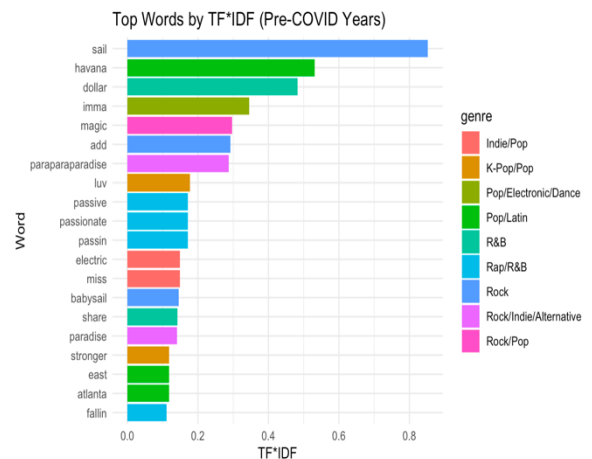

Figure 8. Top Words by TF*IDF (Pre-COVID Years).

then calculated the TF*IDF scores for each word across these periods, with higher scores indicating greater importance and uniqueness of the words. Pre-COVID words (Figure 8) like "sail", "Havana", and "dollar" had high TF*IDF scores which suggests that they are uniquely significant to their respective genres and years. Bigrams (Figure 9) such as "make feel", "love harder", and "deep love" suggests a focus on emotional depth and intensity in relationships.
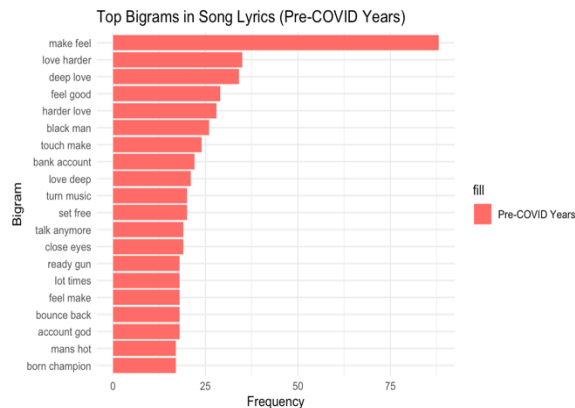

Figure 9. Top Bigrams by TF*IDF (COVID-19) Year.

The year 2020 (Figure 10) saw different keywords gaining prominence like "sugar" and "memories" having high TF*IDF scores. These might reflect the shifting thematic focus during the pandemic, possibly towards nostalgia, adaptation, and change. Bigrams (Figure 11) like "sugar high", "bring back" and "back memories" were notable in 2020. These show themes of reminiscence and positivity. The comparison of pre-COVID and COVID-19 keywords and phrases
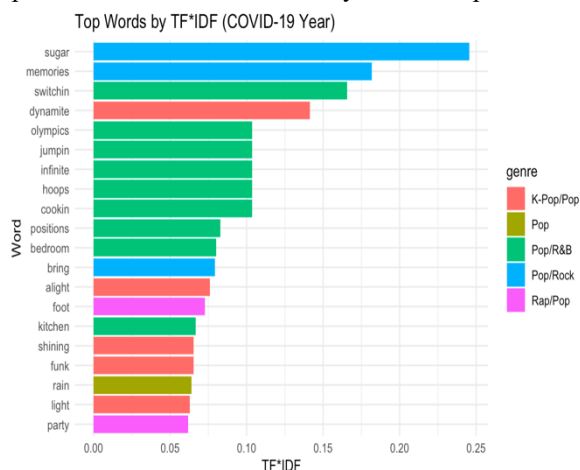

Figure 10. Top Words by TF*IDF (COVID Year).

indicate a slight shift in themes. While pre-COVID songs emphasized diverse themes, the pandemic year seemed to have themes on nostalgia, coping mechanisms, and a search for positivity.
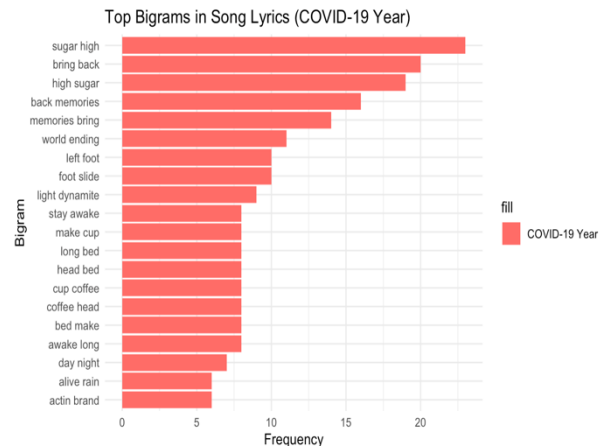

Figure 11. Top Bigrams (COVID Year).

To address our deductive RQ1.1, "How does the sentiment of song lyrics correlate with variables like energy, danceability and valence scores of songs?", we conducted a correlational analysis (Figure 12). We used AFINN sentiment lexicon to assign sentiment scores to the lyrics and then examined how these scores relate to musical variables like energy (nrgy), danceability (dnce), and valence (val). There is a
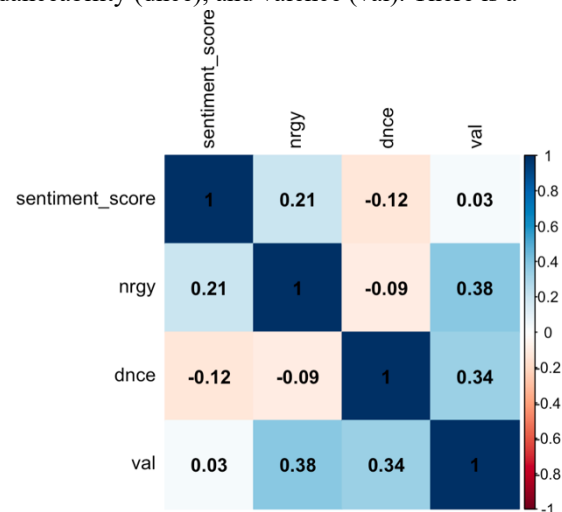

Figure 12. Correlation Matrix.

positive correlation between sentiment score and energy which suggests that songs with higher energy levels tend to have more positive sentiments or generally associated with positive themes. A negative correlation is observed between sentiment score and danceability which might indicate that songs with higher danceability scores tend to have less positive or more neutral/negative sentiments. This could be due to dance songs focusing more on rhythm and beats rather than lyrical content. The correlation between

sentiment score and valence is positive but weak, which suggests that songs with more positive lyrics have slightly more positive music, but the relationship is not strong. Energy and valence show a moderate positive correlation, suggesting that songs with higher energy often have a more positive feel. Danceability and valence also have a positive correlation, indicating that more danceable songs tend to be more positive.

To address our deductive RQ1.2, "With the help of pre-existing sentiment lexicons, how do sentiments in the song lyrics evolve across the decade?", we utilized the Bing sentiment lexicon. This lexicon categorizes words as positive or negative, enabling us to calculate a sentiment score for each year in our dataset. From the bar plot (Figure 13) of sentiment distribution, sine years like 2011 and 2013 had positive net sentiment scores, suggesting that songs from these years generally had more positive lyrics.
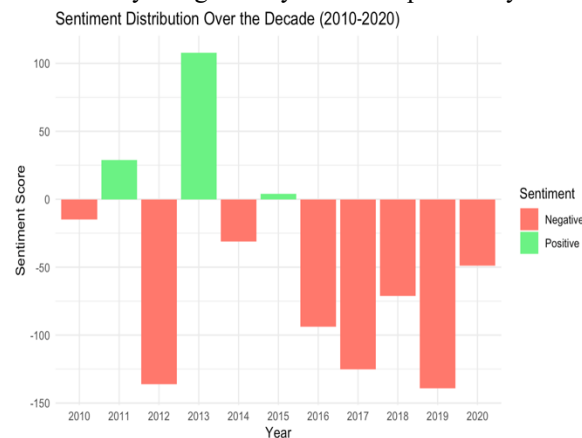

Figure 13. Sentiment Distribution Over the Decade.

Other years, such as 2012, 2014, and notably 2019, showed negative net sentiment scores (with 2019 having the lowest at -139). This indicates that songs from these years were more inclined towards negative themes.

The variation in sentiment scores over the years might reflect the cultural and social dynamic of each period. Positive years could coincide with more optimistic societal moods or popular trends in music, which negative years might reflect challenging times or shifts in musical styles towards more introspective or raw themes.

To address our deductive RQ1.3, "Are there any specific words that are strongly associated with positive or negative sentiment in the lyrics?", we utilized the Bing and NRC sentiment lexicons. These lexicons categorize words as either positive or negative (Bing) and into more specific emotions like joy, anger, fear, etc. (NRC). We analyzed the
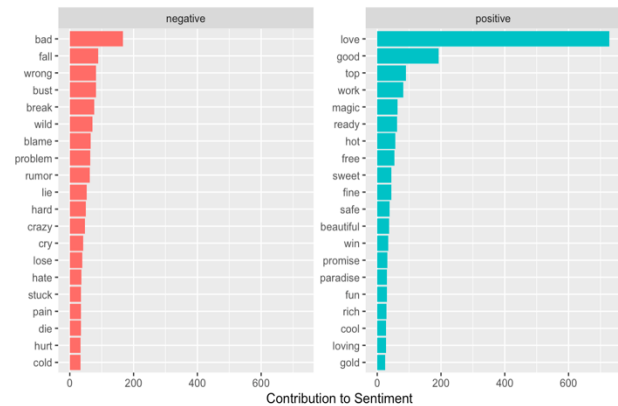

Figure 14. Contribution to Sentiment.

occurrence of these words in song lyrics and created bar plots (Figure 14) to visualize the most prominent positive and negative words, as well as the top songs associated with these sentiments.

The NRC lexicon analysis (Figure 15) provided some insights into specific emotions associated with words in the lyrics. Words associated with anger like "hit" and "blame, indicate that many songs deal with themes of frustration, conflict, or aggression. Words under anticipation, such as "long" and "ready" reflect a sense of looking forward to something. This could
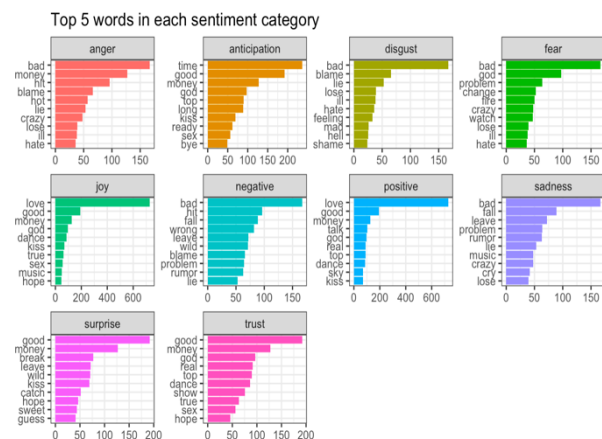

Figure 15. NRC Lexicon: Top words.

be about excitement for future events or changes. The presence of words liked to disgust implies that some songs express strong negative judgements, possibly towards certain situations or behaviors. Words like "problem" and "fire" suggest themes of fear and anxiety. Songs with these words might be address worries and dangers. Joyful words, such as "love" and "dance", are prevalent in songs that celebrate happiness, love and the pleasures of life. The frequent occurrence of

negative words indicate that many songs delve into the less positive aspects of life, like challenges, failures, or heartbreak. Conversely, the abundance of positive words like "good" and "real" points to a significant number of songs that have an optimistic or affirming outlook, highlighting the positive aspects of life and human experiences. Words related to sadness such as "cry" and "lose" show themes of loss and sorrow. Words that evoke surprise, like "break" and "catch", suggest that some songs incorporate elements of plot twists, maybe to keep the listener engaged. Trust-related words, including "true" and "show", indicate songs that deal with themes of honesty reliability, and faithfulness.

From the Bing lexicon analysis, the word "love" emerged as the most frequently occurring positive word, while "bad" was the most common negative word. This highlights the contrast between themes of affection and negativity in songs. Other notable positive words included "good", "top", "work", and "magic", indicating themes of positivity, and success. Among the negative words, "fall", "bust", "wrong", "break", and "wild" were prevalent, suggesting themes of failure and conflict.

We also found the top positive and negative songs in our dataset. Songs like "Barbara Streisand",
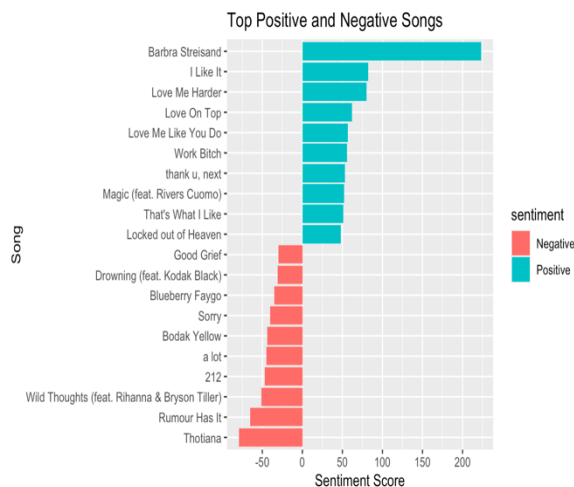

Figure 16. Top Positive and Negative Songs.

"I Like It", and "Love me Harder" had high positive sentiment scores, indicating their overall positive themes. In contrast, songs such as "Thotiana", "Rumor Has It", and "Wild Thoughts" scores negatively, reflecting more negative or challenging themes in their lyrics.

6. Conclusion and Recommendations

The analysis of song lyrics from 2010 to 2020 reveals a dynamic and evolving landscape in the music industry, The decade has seen a diverse range of themes and sentiments, reflecting both the changing societal contexts and the evolving taste of music listeners. Song lyrics have spanned a broad emotional spectrum, from joy and love to anger and sadness. This diversity indicates that songwriters are not just sticking to conventional themes but are exploring a wider array of human experiences and emotions. There is a notable shift in the themes of songs ocer the decade with a mix of introspective, reflective lyrics, and those that are more upbear and celebratory. This reflects the music industry's response to the changing moods and preferenes of its audience.

While there is a balance in the sentiments expressed, using the Bing lexicon, we can see that there seems to be a slight skew towards negative sentiment, as also proven in our study [3]. However, words like "love", "good", and "feel" appear more frequently, suggesting a preference for or prevalance of positive themes in music. It is crucial for artists and producers to understand that while audiences appreciate positive themes, they also resonate with songs that realistically portray life's challenges. A blend of optimism with realism in songwriting could be more relatable. Exploring a range of emotions and experiencea can cater to a broader audience. The power of music lies in its ability to connect emotionally. Songwriters should aim to create lyrics that strike a chord with listeners, whether through joy, nostalgia, sorrow, or hope.

The decade of 2010-2020 in music has been a period of significant diversity and evolution in terms of themes and sentiments in song lyrics. This evolution reflects not only the creative versatility of songwriters and artists but also their keen sensitivity to the changing moods and expereinces of society. As the music industry moves forward, embracing this diversity and continuing to connect with listeners on an emotional level will remain pivotal.

7. Future Research

In this study, we have accomplished our major objectives. However, the analysis of song lyrics and their sentiments opens several avenues for further research expanding our understanding of the relations between music, culture, and societal trends. Future research could extend the timelines, analyzing how song sentiments have evolved over a longer period which could provide insights into how major historical events, cultural shifts, and technological advancements have influenced music. We would also want to include a greater number of songs and lyrics for better analysis. We also aim to include a wider range of music genres to understand how sentiments

are expressed differently across genres. By exploring these, we can greatly enhance the understanding of sentiment trends in music, offering a more comprehensive view of how music reflects and influences societal emotions and cultural narratives.

7. References

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