

# Ed Sheeran’s Music Valence Analysis\*

Grace Nguyen      Steven Li      Tim Chen      Fangning Zhang  
Tommy Fu      Xinxiang Gao

October 10, 2024

This paper explores the emotional trajectory of Ed Sheeran’s music by analyzing the valence, or emotional positivity, of his songs over time. Early in his career, Sheeran’s music displayed a wide range of emotional tones, with significant variation in valence values. From 2015 to 2020, there is a marked increase in positivity, followed by a slight decline post-2020. These findings highlight the dynamic shifts in his music, balancing between upbeat and somber tones throughout his career.

## Table of contents

<b>1</b>	<b>Introduction</b>	<b>2</b>
<b>2</b>	<b>Data</b>	<b>2</b>
<b>3</b>	<b>Results</b>	<b>3</b>
3.1	Valence of Ed Sheeran’s Songs Over Time . . . . .	3
3.2	Observations . . . . .	3
<b>4</b>	<b>Discussion</b>	<b>4</b>
<b>5</b>	<b>Appendix</b>	<b>5</b>
	<b>References</b>	<b>6</b>

---

\*Code and data are available at: [https://github.com/timchen0326/ed\\_sheeran\\_spotify\\_analysis](https://github.com/timchen0326/ed_sheeran_spotify_analysis)

# 1 Introduction

The emotional qualities of music can be quantified using measures such as valence, which reflects the positivity or negativity of a song’s tone. In this paper, we analyze the valence of Ed Sheeran’s songs to trace the evolution of his music over time. By examining changes in the emotional tone of his work, we can gain insights into how his artistic expression has evolved. Early in his career, Sheeran explored a wide emotional range, producing both upbeat and melancholic tracks. However, over time, his music shows shifts in tone, particularly between 2015 and 2020, when a more positive trend emerges before settling into a more neutral balance.

The remainder of this paper is structured as follows. Section 2 provides a sample look at the data. Section 3 presents trends in Ed Sheeran’s song valency over the years. Section 4 dives into the analysis of the trends.

The dataset was downloaded using R (R Core Team 2023), and Spotify API (Thompson et al. 2022), with support using usethis (Wickham et al. 2024). The dataset was also cleaned and plotted using the tidyverse (Wickham et al. 2019), knitr (Xie 2023), and ggplot2 (Wickham 2016) packages.

## 2 Data

Table 1 is a sample of the downloaded data from Spotify (Thompson et al. 2022), and the columns needed for our analysis.

Table 1: Sample Data

album_release_date	valence
2017-03-03	0.862
2024-09-27	0.931
2014-06-21	0.359
2022-05-27	0.734
2014-06-20	0.189

Figure 2 in the appendix Section 5 shows a distribution of valence (positivity) of Ed Sheeran’s songs, illustrating that most songs have a valence between 0.25 and 0.75, with a peak around 0.35-0.40.

### 3 Results

#### 3.1 Valence of Ed Sheeran's Songs Over Time

Figure 1 represents the valence, or emotional positivity, of Ed Sheeran's songs across his career, as measured over time based on album release dates. Valence is a measure of the musical tone of a song, where higher values indicate more positive emotions and lower values represent more negative or somber tones.

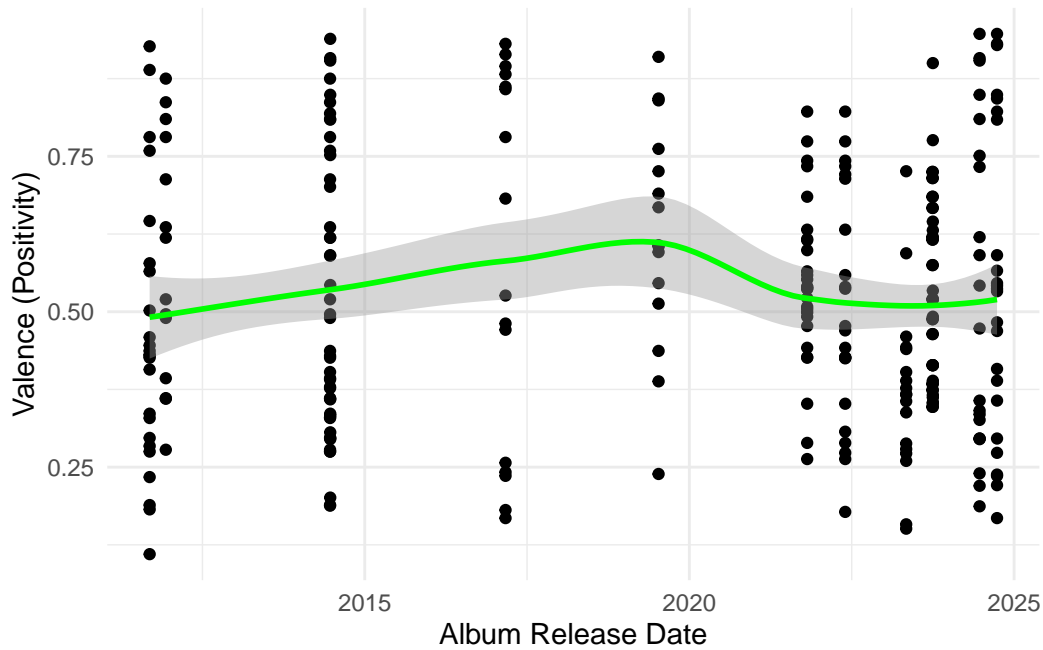


Figure 1: Valence (Positivity) of Ed Sheeran's Songs Over Time

#### 3.2 Observations

Figure 1 illustrates the evolution of Ed Sheeran's music through individual songs as data points, with the trend line providing an overview of the emotional changes over time. In his early career (pre-2015), his songs displayed a wide range of valence values, reflecting diverse emotional tones. Some tracks displayed low valence, signaling somber or negative emotions, while others were more upbeat with higher valence. This period highlights Ed Sheeran's exploration of a broad spectrum of moods, showcasing significant emotional variety in his early work.

Around 2015, a noticeable upward trend emerges, reflecting a shift towards a more upbeat and consistent tone. However, after 2020, there is a slight decline in valence, suggesting a return

to a more neutral emotional balance. Despite this, individual songs continue to vary widely in emotional expression, showing that Ed Sheeran's music still explores a range of moods. Overall, the valence trend stabilizes around 0.5, indicating a balance between upbeat and somber tones across his career.

## 4 Discussion

This analysis of Ed Sheeran's music over time reveals several key trends. Early in his career, Sheeran's songs showcased a wide emotional range. Between 2015 and 2020, his music became more positive overall, reflecting a shift towards optimism during that period. However, after 2020, there is evidence of a slight return to more neutral emotional tones, with less focus on purely positive content.

These trends suggest that Ed Sheeran's artistic evolution has involved experimenting with a range of emotions, while maintaining a generally consistent balance between positive and negative tones. The fluctuations in the graph highlight his versatility in conveying both joy and melancholy in his work.

## 5 Appendix

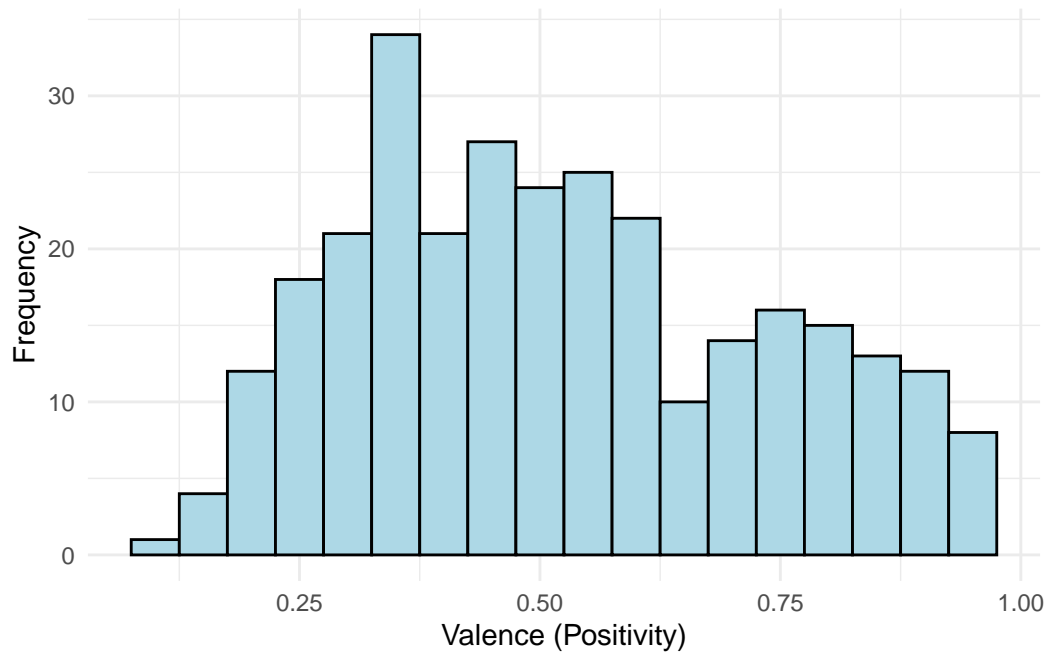


Figure 2: Distribution of Valence in Ed Sheeran's Songs

## References

- R Core Team. 2023. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. <https://www.R-project.org/>.
- Thompson, Charlie, Daniel Antal, Josiah Parry, Donal Phipps, and Tom Wolff. 2022. *spotifyr: R Wrapper for the 'Spotify' Web API*. <https://github.com/charlie86/spotifyr>.
- Wickham, Hadley. 2016. *ggplot2: Elegant Graphics for Data Analysis*. Springer-Verlag New York. <https://ggplot2.tidyverse.org>.
- Wickham, Hadley, Mara Averick, Jennifer Bryan, Winston Chang, Lucy D'Agostino McGowan, Romain François, Garrett Golemund, Alex Hayes, et al. 2019. "Welcome to the tidyverse." *Journal of Open Source Software* 4 (43): 1686. <https://doi.org/10.21105/joss.01686>.
- Wickham, Hadley, Jennifer Bryan, Malcolm Barrett, and Andy Teucher. 2024. *usethis: Automate Package and Project Setup*. <https://CRAN.R-project.org/package=usethis>.
- Xie, Yihui. 2023. *knitr: A General-Purpose Package for Dynamic Report Generation in R*. <https://yihui.org/knitr/>.