

# Comparative Analysis of TWICE and Stray Kids' Musical Evolution Using Spotify Data

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This study compares the musical evolution of TWICE and Stray Kids using data from (Spotify 2023). TWICE consistently shows higher valence, reflecting their upbeat style, while Stray Kids have a more varied and intense sound. These trends highlight their distinct artistic paths. The findings offer insight into their evolving roles in K-pop.

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# 1 Introduction

The K-pop industry has experienced significant growth over the last decade, with many groups gaining global popularity. In our analysis, we will focus on two K-pop groups: TWICE (a female group) and Stray Kids (a male group). Both groups have unique styles that resonate with different audiences. Using data from the Spotify API (Spotify 2023), we aim to explore how their music has evolved over time, particularly in terms of characteristics such as song duration and valence. By comparing these features with their respective album release dates, we hope to gain insights into their musical trajectories and artistic evolution.

The paper is structured as follows: Section 2 discusses how the data was collected from Spotify API (Spotify 2023). Section 3 shows a graphical visualization of the data and explains some trends that can be seen. Next, Section 4 covers interpretations of the data from Section 3. Section 5 discusses the concluding remarks of this paper. Finally, Section 6 includes additional supporting data and Section 6 contains the references used in this paper.

## 2 Methodology

### 2.1 Data Collection

For this analysis, we used the Spotify API (Spotify 2023) to extract data for TWICE and Stray Kids. Specifically, we retrieved the release dates, durations, and valence information for each track on their albums. Sample data for each group can be found in Section 6.

The valence score, which ranges from 0.0 to 1.0, reflects the overall mood of a track. Higher values indicate happier or more positive-sounding music, while lower scores represent sadder or more negative moods. The duration variable measures how long the songs are, expressed in milliseconds. The release date variable indicates the year each particular album was released.

The analysis was performed in R (R Core Team 2023) using several packages, including `spotifyr` (Thompson et al. 2022), `usethis` (Wickham et al. 2024), `tidyverse` (Wickham et al. 2023), `dplyr` (Wickham, François, et al. 2023), `knitr` (Xie 2021), and `devtools` (Wickham et al. 2022). These packages allowed us to query Spotify's database for the audio features of each track and to create graphs and tables. ChatGPT (OpenAI (2023)) was used to help with the coding of the graphs.

### 3 Results

#### 3.1 Song Duration Analysis

We plotted the song duration over time for both TWICE (see Figure 1) and Stray Kids (see Figure 2). The visualized trends suggest that the average duration of tracks for both groups has remained relatively consistent, with only minor fluctuations over time. There is no clear pattern indicating that either group has significantly increased or decreased the length of their songs as their catalogs have expanded. This observation suggests that song duration is more likely influenced by overall K-pop standards, which tend to favor shorter, radio-friendly tracks.

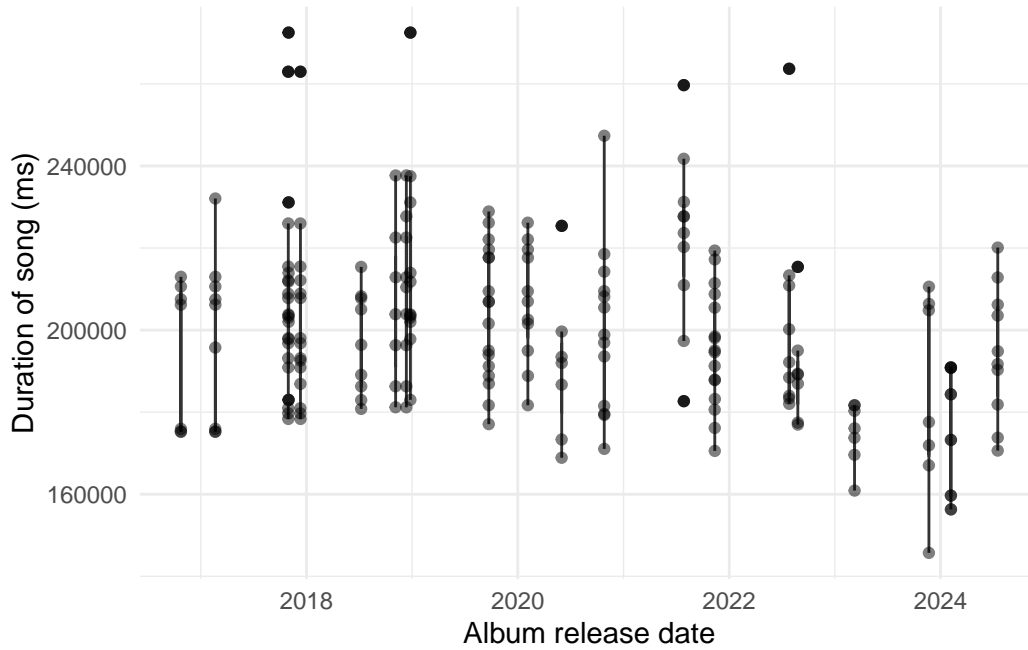


Figure 1: TWICE Song Data Analysis

#### 3.2 Valence Analysis

In Figure 3, we compare the valence scores of TWICE and Stray Kids across their respective release dates.

TWICE: The analysis reveals a slight upward trend in valence for TWICE, particularly noticeable from 2017 to 2022. This suggests that TWICE has increasingly released tracks with a

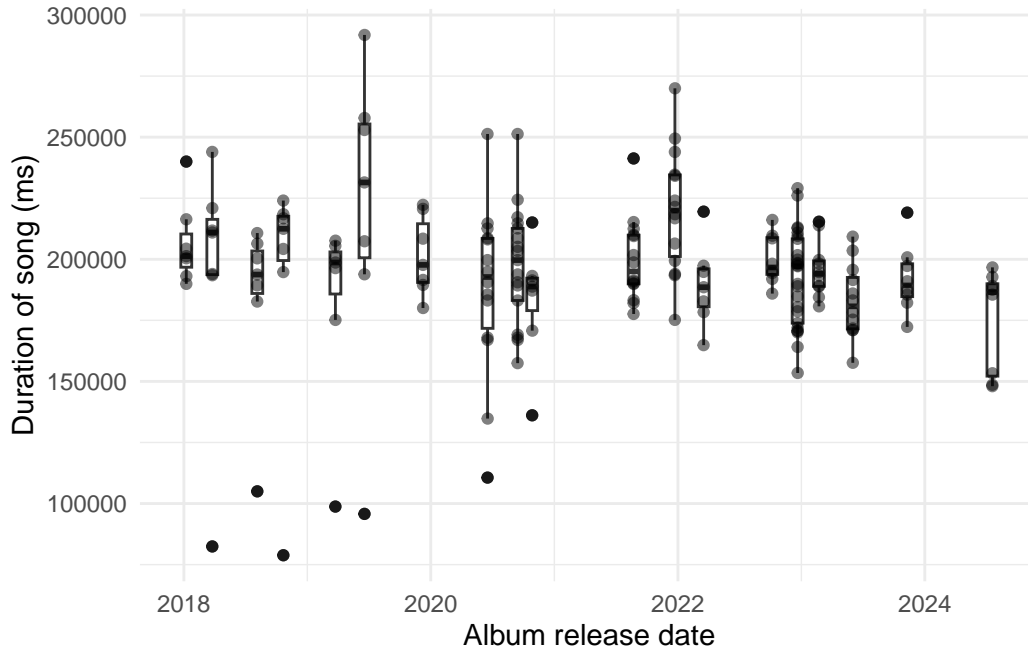


Figure 2: Stray Kids Song Data Analysis

positive, happy vibe, aligning with their reputation for upbeat, bubblegum pop music. However, in more recent albums, the valence shows a slight decrease, indicating that TWICE may be experimenting with more mature sounds in some of their latest releases.

Stray Kids: In contrast, Stray Kids exhibit a relatively consistent valence trend, with a slight downward shift in recent years. Their valence scores fluctuate between 0.5 and 0.75, reflecting both positive and more intense, serious moods. This aligns with their image as a group known for their harder-edged, experimental sound, often featuring themes of resilience and struggle.

The comparison between the two groups highlights their differing artistic directions. While TWICE continues to lean towards upbeat, positive tracks, Stray Kids appears to be exploring more complex emotional themes.

## 4 Discussion

The findings from this analysis provide insights into the musical evolution of both groups. TWICE, known for their catchy, bright songs, continues to produce music that aligns with their cheerful image, while also beginning to experiment with more nuanced emotions in their later releases. In contrast, Stray Kids remain true to their experimental and intense sound, showing a slight shift toward tracks with lower valence, which reflect more complex and darker emotional

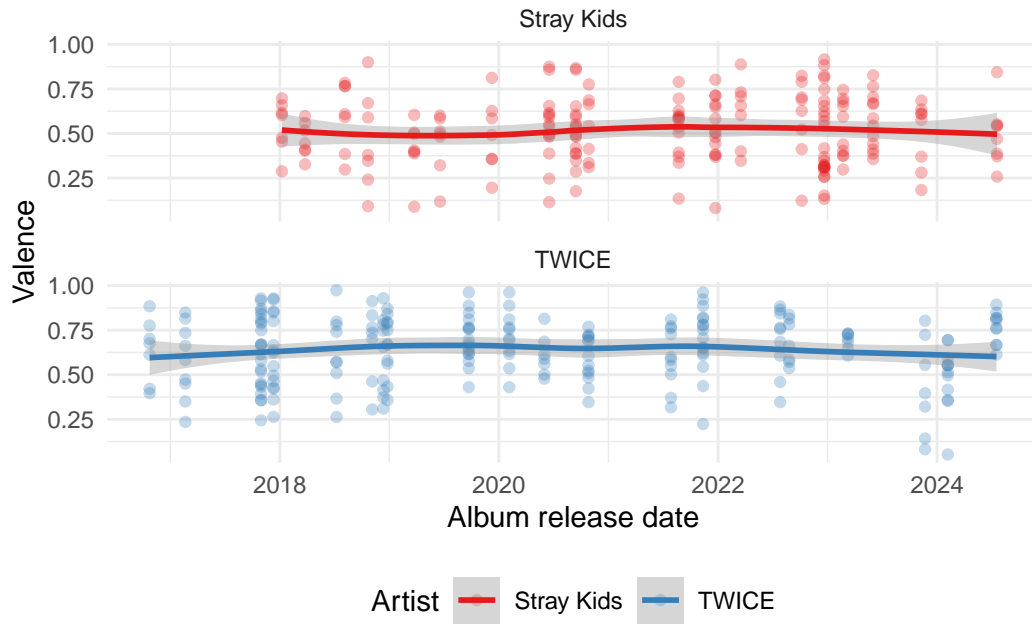


Figure 3: Comparing the Valence of TWICE vs Stray Kids songs

These observations align with the groups' public personas: TWICE has evolved from youthful exuberance to a more versatile, mature sound, whereas Stray Kids are characterized by their innovative approach to music, often exploring themes of self-discovery and resilience.

## 5 Conclusion

In this study, we utilized Spotify data to compare the musical characteristics of two K-pop groups, TWICE and Stray Kids. By analyzing song duration and valence across their albums, we found that TWICE has generally maintained a positive, high-valence trend, while Stray Kids consistently produce tracks that blend both positive and serious tones, showing a slight downward shift in valence in their more recent work. This comparative analysis sheds light on the evolving musical styles of both groups, reflecting their individual growth and artistic trajectories within the global K-pop landscape.

## 6 Appendix

Table 1: First 10 Observations of TWICE Song Analysis Data

artist_name	track_name	album_name	duration_ms	valence
TWICE	Beyond the Horizon	DIVE	212826	0.613
TWICE	DIVE	DIVE	181860	0.893
TWICE	Ocean Deep	DIVE	220106	0.761
TWICE	LOVE WARNING	DIVE	206200	0.806
TWICE	Here I am	DIVE	170640	0.667
TWICE	Inside of me	DIVE	173786	0.848
TWICE	Peach Soda	DIVE	190306	0.818
TWICE	Echoes of heart	DIVE	194840	0.667
TWICE	Dance Again	DIVE	191706	0.818
TWICE	Hare Hare	DIVE	203546	0.758

Table 2: First 10 Observations of Stray Kids Song Analysis Data

artist_name	track_name	album_name	duration_ms	valence
Stray Kids	MOUNTAINS	ATE	187545	0.551
Stray Kids	Chk Chk Boom	ATE	148051	0.844
Stray Kids	JJAM	ATE	185527	0.541
Stray Kids	I Like It	ATE	148632	0.469
Stray Kids	Runners	ATE	196684	0.546
Stray Kids	twilight	ATE	192777	0.258
Stray Kids	Stray Kids	ATE	189050	0.372
Stray Kids	Chk Chk Boom (Festival Ver.)	ATE	153347	0.387
Stray Kids	MEGAVERSE	ROCK- STAR	185520	0.576
Stray Kids	LALALALA	ROCK- STAR	182224	0.609

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