BTS Albums: Danceability, Energy, and Speechiness from 2013-2022*

An Analysis of the World's Biggest Boyband's Albums

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This paper utilizes data from Spotify API to discuss the Danceability, Energy, and Speechiness South Korean boyband BTS's albums. We find that while the danceability levels stayed consistent, the energy and speechiness increased. These findings matter as Kpop has been gaining popularity in Western world, and suggest high energy and speechiness as important factors of the success of Kpop. The results provide insights into the evolution of BTS's music and the popularity of Kpop, which are be useful for industry professionals, fans, and researchers interested in the characteristics of successful Kpop.

1 Introduction

> "Music transcends language. BTS communicates with our fans by staying true to ourselves and believing in music every day."
>
> — RM, Leader of BTS

On April 10th, 2017, Billboard Music Awards announced their nominees for Top Social Artist. Among the nominees was K-pop boy band, BTS, who were the first ever K-pop group to be nominated—and then proceed to win—a Billboard Music Award. Since then, they have continued to win the category for five consecutive years.

In recent years, Korean pop music, commonly known as K-pop, has gained immense popularity in the United States and the greater Western market. However, the K-pop music that succeeds in the West may have different characteristics than authentic K-pop music in Korea. Thus, in this paper, I will examine the danceability, energy, and speechiness levels of BTS's song. and whether these characteristics changed after they moved into the US Market in 2017. My

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*Code and data are available at: https://github.com/joycexuan/BTS.

estimand is, what are the average danceability, energy, and speechiness levels of BTS's songs and albums, and how did these characteristics change after they moved into the US Market in 2017?

Using data from Spotify API, I explored the trend of danceability, energy, and speechiness scores in BTS's albums from their debut in 2013 to their latest release in 2022. Danceability, energy, and speechiness are crucial elements in popular music as they can engage and appeal to different listeners. My findings show that, on average over the years, danceability increased, while energy stayed consistent, and speechiness decreased. I will first visualize these data over time by album average, then discuss in detail how these scores changed post-2017. Additionally, I will draw from third-party sources to investigate the meaning and relationship of these scores to the popularity and reception of Kpop music in the United States.

Despite the majority of their songs being in the Korean language, BTS is the most popular and successful boyband in the world. Therefore, this exploration is critical as it helps Kpop artists and fans visualize the creation, marketing, and ultimate success of Kpop music in the future. By analyzing danceability, energy, and speechiness, we can gain a deeper understanding of the factors that contribute to the success of Kpop and popular music in general.

I will first discuss the source of data used in this paper, the strengths and weaknesses of the Spotify API, as well as methodologies and data terminology. Then, I will discuss the results from my graphs, including the trend over the 2013-2022 time period. Furthermore, I will explore the factors that contribute to the trends of BTS's song characteristics, and the difference in their style before and after their success in the Western market. For the analysis, I will use the statistical programming language R (R Core Team 2020), as well as the packaged tidyverse (Wickham et al. 2019), here (Müller 2020), dplyr (Wickham et al. 2023), All figures in the report are generated using ggplot2 (Wickham 2016).

2 Data

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```r
library(dplyr)
library(ggplot2)

BTS <- read_csv(here::here("inputs/data/BTS_mean.csv"), show_col_types = FALSE)

BTS$album_release_date <- as.Date(BTS$album_release_date)

# Finding the average danceability, energy, and speechiness of BTS albums
averages <- BTS %>%
  group_by(album_name, album_release_date, album_release_year) %>%
```
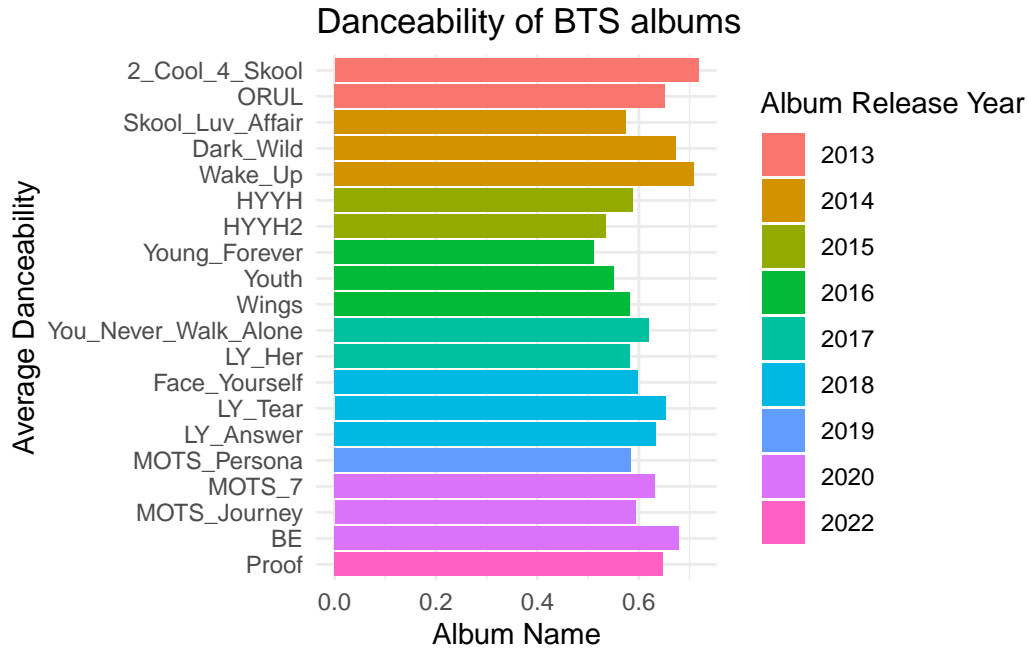
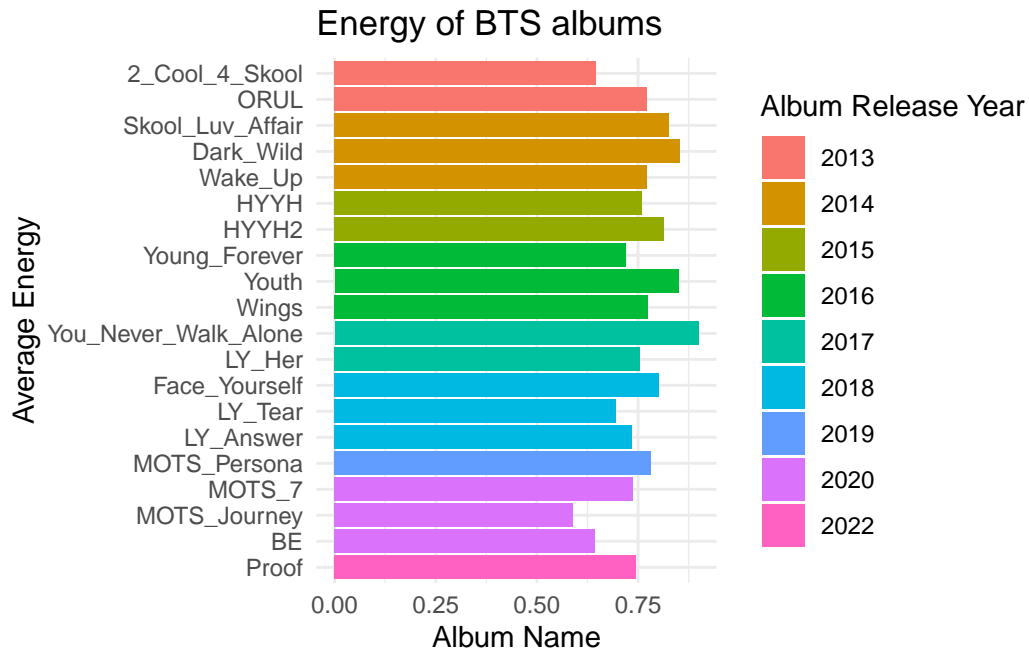Figure 1: Average Danceability of BTS Albums from 2013-2022

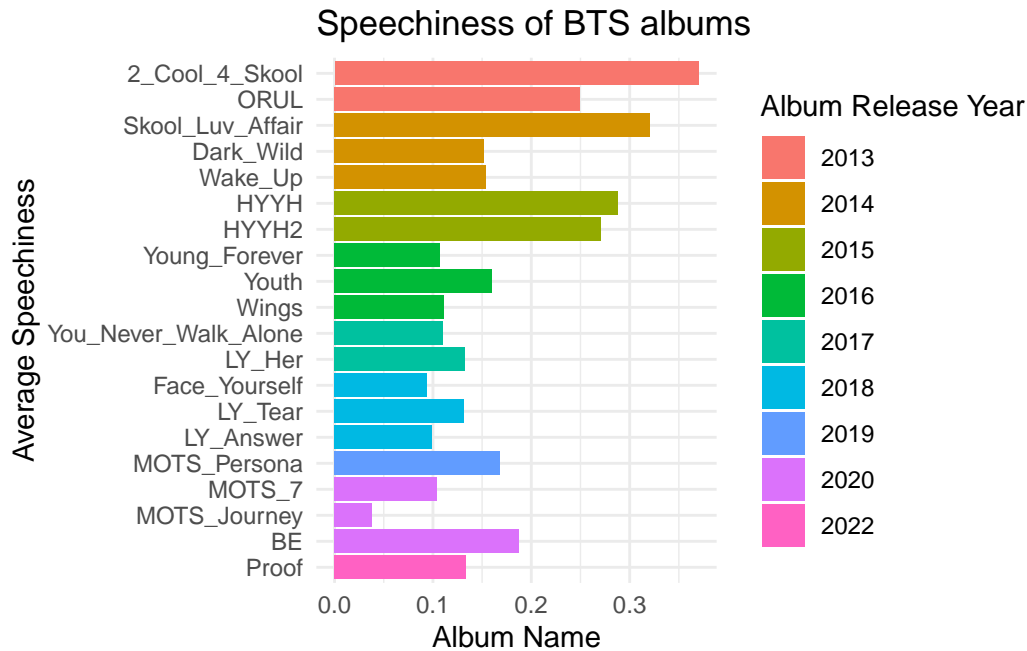Figure 2: Average Energy of BTS Albums from 2013-2022

Figure 3: Average Speechiness of BTS Albums from 2013-2022

```
summarise(avg_dance = mean(danceability),
          avg_energy = mean(energy),
          avg_speechiness = mean(speechiness)) %>%
arrange(album_release_date)
```

`summarise()` has grouped output by 'album_name', 'album_release_date'. You can override using the `.groups` argument.

```
ggplot(averages, aes(x = album_release_date)) +
  geom_line(aes(y = avg_dance, color = "Danceability")) +
  geom_line(aes(y = avg_energy, color = "Energy")) +
  geom_line(aes(y = avg_speechiness, color = "Speechiness")) +
  labs(title = "Average Danceability, Energy, and Speechiness of BTS Albums",
       x = "Album Release Date",
       y = "Average Value",
       color = "Attribute") +
  theme_minimal() +
  scale_color_manual(values = c("Danceability" = "pink", "Energy" = "purple", "Speechiness
  theme(legend.position = "top")
```

Average Danceability, Energy, and Speechiness of BTS Albur

Attribute ── Danceability ── Energy ── Speechiness
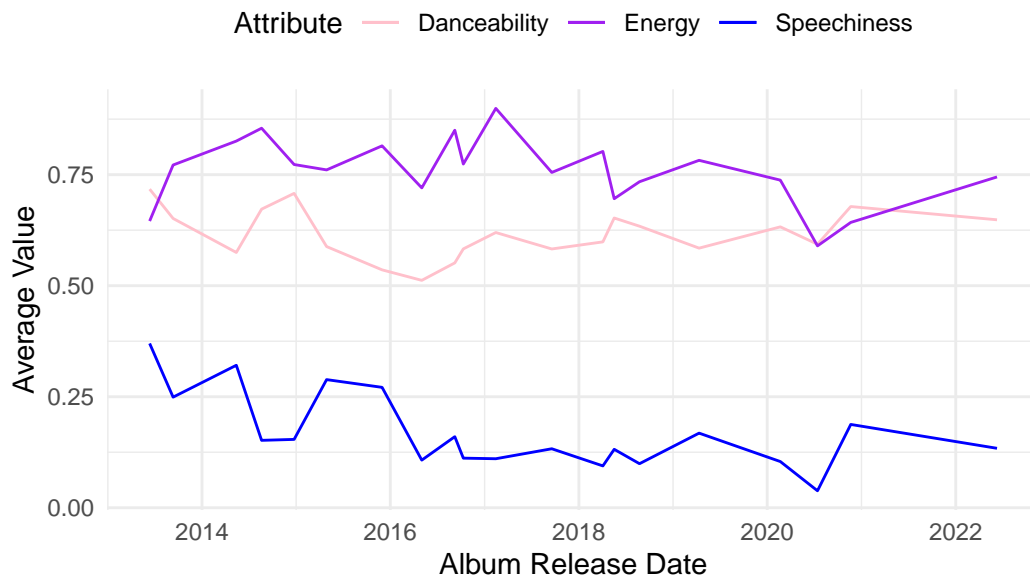

```
scale_x_date(date_breaks = "1 year", date_labels = "%Y")
```
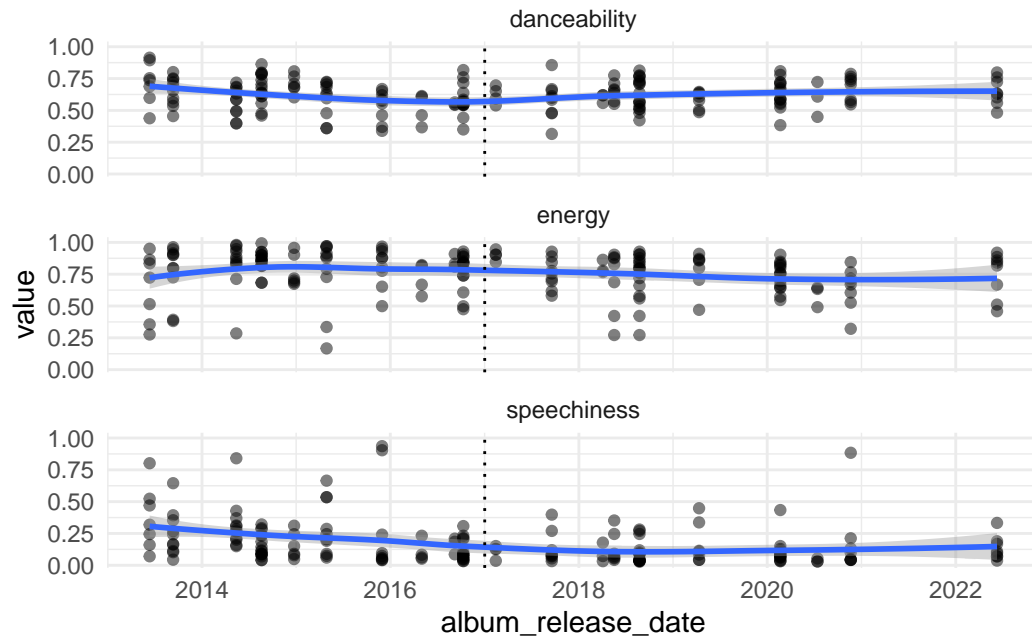
```
<ScaleContinuousDate>
 Range:
 Limits:    0 --    1
```

```
  BTS %>%
    select(album_release_date, danceability, energy, speechiness) %>%
    pivot_longer(cols = c(danceability, energy, speechiness)) %>%
    ggplot(aes(x = album_release_date, y = value)) +
    geom_point(alpha = 0.5) +
    geom_smooth() +
    theme_minimal() +
    geom_vline(xintercept = lubridate::ymd("2017-01-01"),
               linetype="dotted") +
    facet_wrap(vars(name),
               nrow = 3)
```

```
`geom_smooth()` using method = 'loess' and formula = 'y ~ x'
```

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3 Model

4 Results

Lorem Ipsum

5 Discussion

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Appendix

A Additional details

B Acknowledgements

References

Müller, Kirill. 2020. *Here: A Simpler Way to Find Your Files.* https://CRAN.R-project.org/package=here.

R Core Team. 2020. *R: A Language and Environment for Statistical Computing.* Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.org/.

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 Grolemund, et al. 2019. "Welcome to the tidyverse." *Journal of Open Source Software* 4 (43): 1686. https://doi.org/10.21105/joss.01686.

Wickham, Hadley, Romain François, Lionel Henry, Kirill Müller, and Davis Vaughan. 2023. *Dplyr: A Grammar of Data Manipulation.*