Analysis of Radiohead's Music Factors Affecting Danceability*

A weak correlation between valence and dancebility.

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This paper investigates the factors influencing the danceability of Radiohead's tracks by analyzing tempo, and valence. Our findings indicate that tempo shows no statistically significant correlation with danceability, suggesting it does not play a major role in determining the danceable quality of the songs. Valence exhibits a weak positive correlation with danceability, indicating a modest association where higher valence tracks tend to be slightly more danceable.

1 Introduction

This paper investigates the factors influencing the danceability of Radiohead's tracks by analyzing key musical features: tempo, and valence. Tempo refers to the speed of the music. Valence measures the perceived positivity or emotional quality of a song, with higher values reflecting more cheerful and energetic tones, on a scale of 0.0 - 1.0. By examining the relationship between these variables and the danceability of Radiohead's songs, we seek to gain insights into the musical elements that enhance or hinder the ability of a track to engage listeners and encourage movement.

The paper aims to find a correlation between tempo and valence with danceability. After performing data cleaning and analysis, specific musical characteristics significantly influence the danceability of Radiohead's tracks. Tempo plays a prominent role, as songs with a higher beats-per-minute (BPM) rate exhibit a stronger association with increased danceability, suggesting that faster-paced tracks are more likely to encourage listeners to dance. Furthermore, songs with higher valence—indicative of a more positive, cheerful emotional quality—are also associated with greater danceability. These findings suggest that tempo, mode, and valence

*Code and data are available at: https://github.com/sarahdingg/SpotifyProject/tree/main/SpotifyAPI.

collectively contribute to the danceable nature of Radiohead's music, shedding light on how these elements provoke movement and engagement in listeners. Thus, if musicians want to create a danceable music track they should consider making music with a faster pace also known as a higher beats-per-minute (BPM) to give an inspirational and uplifting tone.

The remainder of the paper is structured as follows. Section 2 includes two linear regression models that display the correlations between danceability and valence, as well as danceability and tempo.

2 Data

To analyze data from spotifyr (Thompson 2023), we used the statistical programming language R (R Core Team 2023), tidyverse (Wickham et al. 2023), and dplyr (Wickham, François, et al. 2023) to assist with cleaning and analyzing the data. The data was plotted using ggplot2 (Wickham, Chang, et al. 2023).

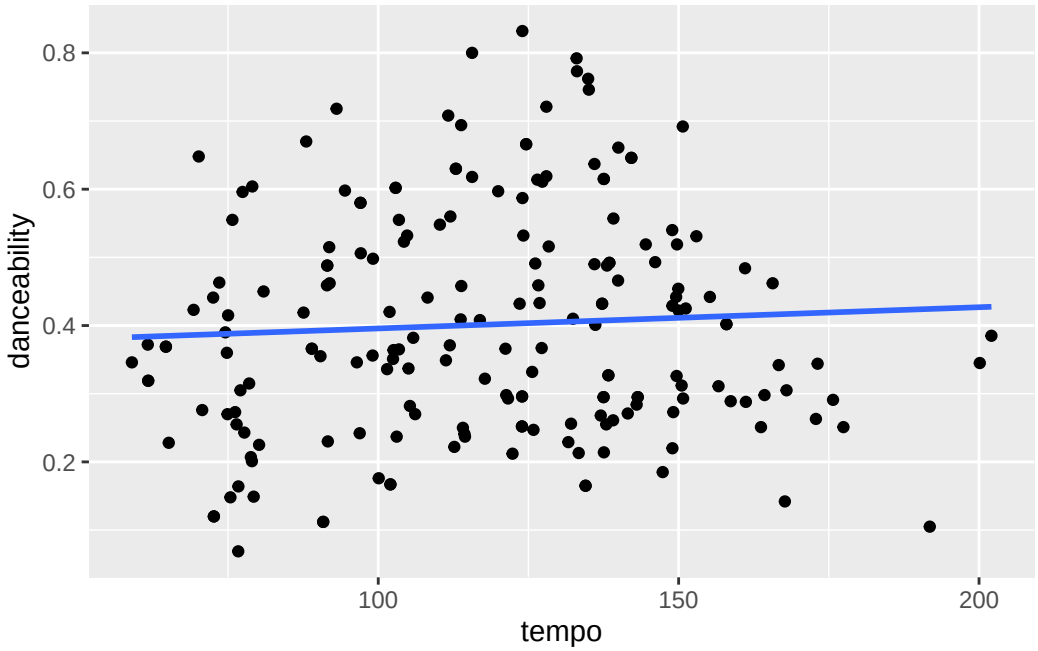

Figure 1: Tempo vs Danceability: The relationship between tempo and danceability shows no statistical significance between tempo and danceability, indicating that variations in tempo do not meaningfully predict the danceability of the songs.

Figure 1 shows a linear regression between tempo (x-axis) and danceability (y-axis) for a set of songs. Each dot represents an individual song, with the blue line indicating the trend from the regression model. The regression line is almost flat, suggesting a weak positive relationship

between tempo and danceability. However, the spread of the data points reveals that tempo is not a strong predictor of danceability. The regression model indicates no statistically significant relationship between the two variables, meaning changes in tempo do not substantially affect a song's danceability.

2.1 Relationship between valence and danceability

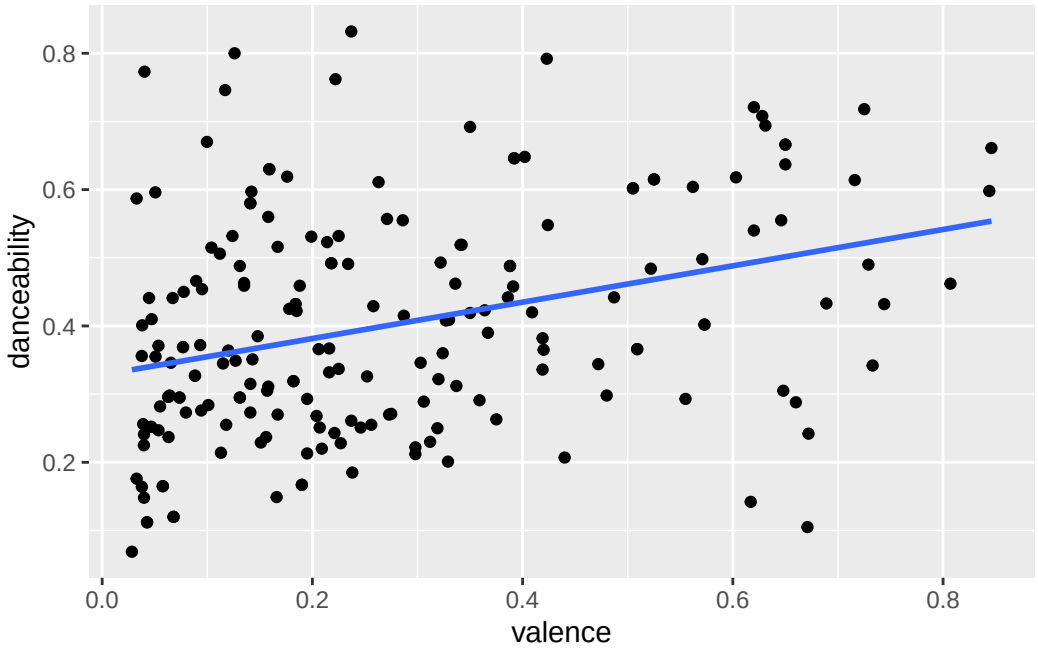

Figure 2: Valence vs Danceability: The relationship between valence and danceability reveals a weak positive correlation, indicating that while songs with higher valence—reflecting a more positive emotional tone—tend to have slightly higher danceability scores, the relationship is not particularly strong.

The upward slope in Figure 2 displays a weak positive correlation between valence and danceability for Radiohead's songs. Each point represents an individual song, with the blue line showing the trend from the regression model. Songs with higher valence—representing a more positive emotional tone—tend to have slightly higher danceability scores. However, the spread of the points indicates that the relationship between valence and danceability is not particularly strong.

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. 2023. *Spotifyr: R Wrapper for the 'Spotify' Web API*. https://cran.r-project.org/web/packages/spotifyr/.

Wickham, Hadley et al. 2023. *Tidyverse: Easily Install and Load the 'Tidyverse'*. https://CRAN.R-project.org/package=tidyverse.

Wickham, Hadley, Winston Chang, Lionel Henry, Thomas Lin Pedersen, Kohske Takahashi, Claus Wilke, Kara Woo, Hiroaki Yutani, and Dewey Dunnington. 2023. *Ggplot2: Elegant Graphics for Data Analysis*. https://CRAN.R-project.org/package=ggplot2.

Wickham, Hadley, Romain François, Lionel Henry, and Kirill Müller. 2023. *Dplyr: A Grammar of Data Manipulation*. https://CRAN.R-project.org/package=dplyr.