The Evolution of Linkin Park: Evaluating Loudness and Noise Across Time*

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This paper evaluates the evolution of Linkin Park's instrumentalness and loudness over their multiple albums. Our results suggest that Linkin Park's instrumentalness increased over time but their loundess remained the same, suggesting that they stayed true to their heavy metal roots. Future analysis should include a qualitative study of Linkin Park to validate our results.

1 Introduction

Linkin Park is one of the perennial rock banks of our time. Notably, they have gone through multiple changes in their band members and have gone through multiple changes in their sound. In this paper, we will analyze how Linkin Park's instrumentalness and loudness evolved over time, wondering if their sound over time. The remainder of the paper is structured as follows Section 2 discusses the data and the relevant measurement methodologies; Section 3 presents the data's results; Section 4 discusses our findings.

2 Data Overview

This dataset on Linkin Park on Spotify was scraped using the Spotify API (Thompson et al. 2022). The variables of interest in the paper are Album Release Date, which shows when the album was released. We're also interested in instrumentalness, which predicts if a track has no vocals, and loudness, which shows how loud a song is. We believe these two variables characterize key elements of rock music: instrumental solos and loud vocals.

There were 12 rows that only showed the year with no month or date data, so we removed them in our cleaned dataset.

*Code and data are available at: https://github.com/cher-ning/spotify-data.git

The paper uses the R programming language (R Core Team 2023) to analyze the dataset. The tidyverse (Wickham et al. 2019) and janitor (Firke 2023) packages were used to download and clean the dataset. Finally, ggplot2 (Wickham 2016), (Wickham et al. 2019), and knitr (Xie 2024) packages were used to display the results.

3 Results

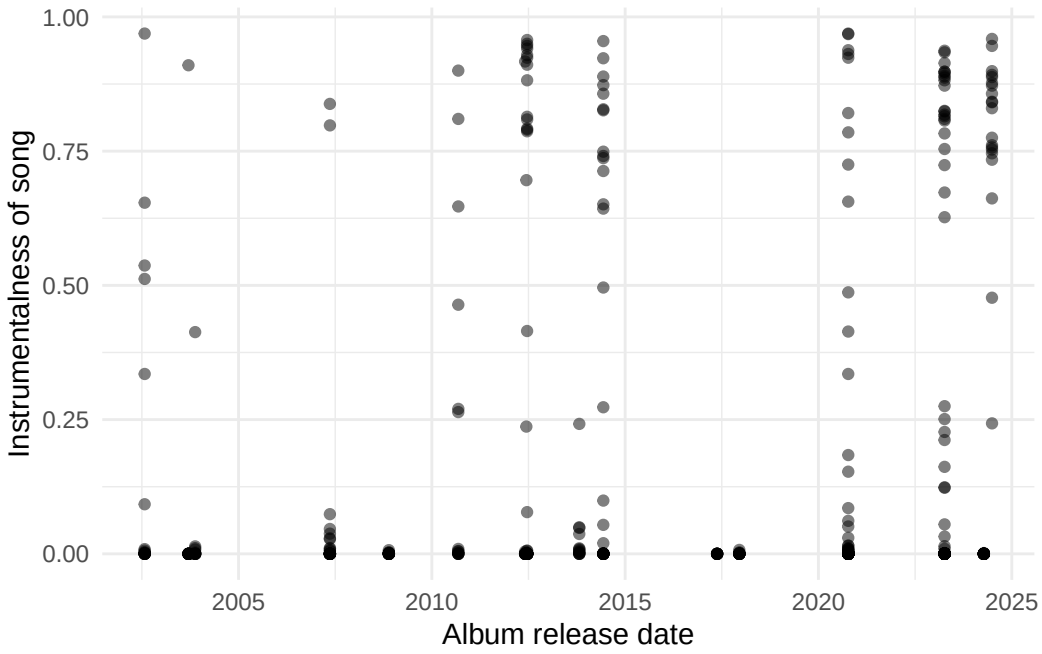

Figure 1: Linkin Park Album Instrumentalness Across Time

Figure 1 shows that instrumentalness gets higher over time. This shows that as Linkin Park's sound evolved over time, the amount of instrumentalness increased.

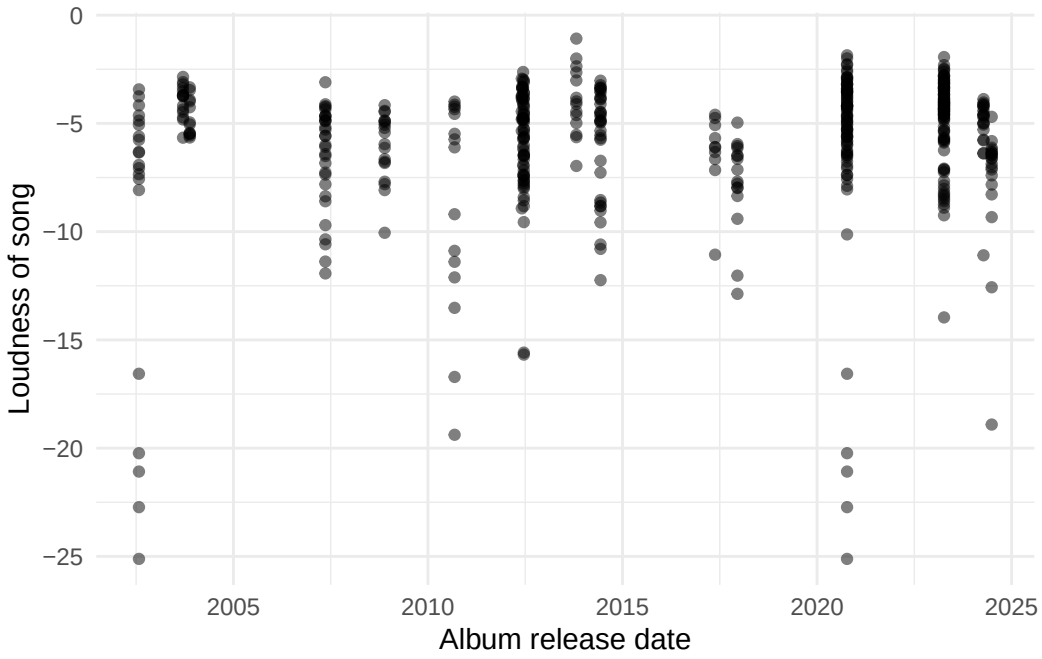

Figure 2: Linkin Park Album Loudness Across Time

Figure 2 shows that Linkin Park's loudness in albums did not change as much over time.

4 Discussion

Figure 1 shows that Linkin Park made changes to the extent their songs feature instrumentals than vocals. As time passed, the probability for their songs to contain more instrumetnal features than vocals increased, signalling a change in their music.

Figure 2 does not suggest that there were a lot of changes in the group's noise. This signals that Linkin Park's sound did not change in terms of stereotypical heavy metal characteristics. Overall, Linkin Park's music changed a lot but certain elements relating to heavy metal rock stayed the same to appeal to their core audience.

Some limitations of the paper is that it is difficult to quantify how much their music has changed with our variables of interest. A qualitative discussion on Linkin Park's changes is something that needs to be further studied.

Appendix

A Additional data details

A.1 Data Sample

Table 1: First 5 Rows of Cleaned Data

instrumentalness	album_release_date	loudness
0.8	2024-06-28	-9.3
0.7	2024-06-28	-5.8
0.2	2024-06-28	-12.6
0.8	2024-06-28	-6.2
0.9	2024-06-28	-7.0

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