Rush hour subways surprisingly excel at punctuality: a closer look at TTC Delays*

Insight into when delays disproportionately tend to happen and related statistics

Andrew Goh, Yisu Hou, Jiwon Choi

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This paper uses data from Open Data Toronto on TTC subway and bus delays to analyze how the delays are generally distributed w.r.t. the time of day. Mean, total, and adjusted statistics were graphed, leading to the conclusions that subways are almost always more punctual than buses, peak hour leads to the fewest delays, and leaving 10-15 minutes earlier is a safe margin of error for delays. The conclusions of this paper provide a practical, actionable set of guidelines on how citizens can ensure/maximize punctuality when using the TTC to go about the city, as well as potential insight into where resources can be invested in to increase TTC efficiency the most.

1 Introduction

Write Introduction here

2 Data

The R programming language (R Core Team (2023)), dplyr (Wickham et al. (2023)), opendatatoronto((**opendatatoronto?**)), and tidyverse(Wickham et al. (2019)) were used to download, modify, and analyse data obtained from Open Data Toronto. Styler (Müller and Walthert (2023)) was used to style the code. Data used in this paper comes from the "TTC Subway Delays" ((**subway_data?**)) and "TTC Bus Delays" ((**bus_data?**)) data sets from the Open Data Toronto database, published by the TTC.

*Code and data are available at: https://github.com/mushroomcarbon/TTCDelays.

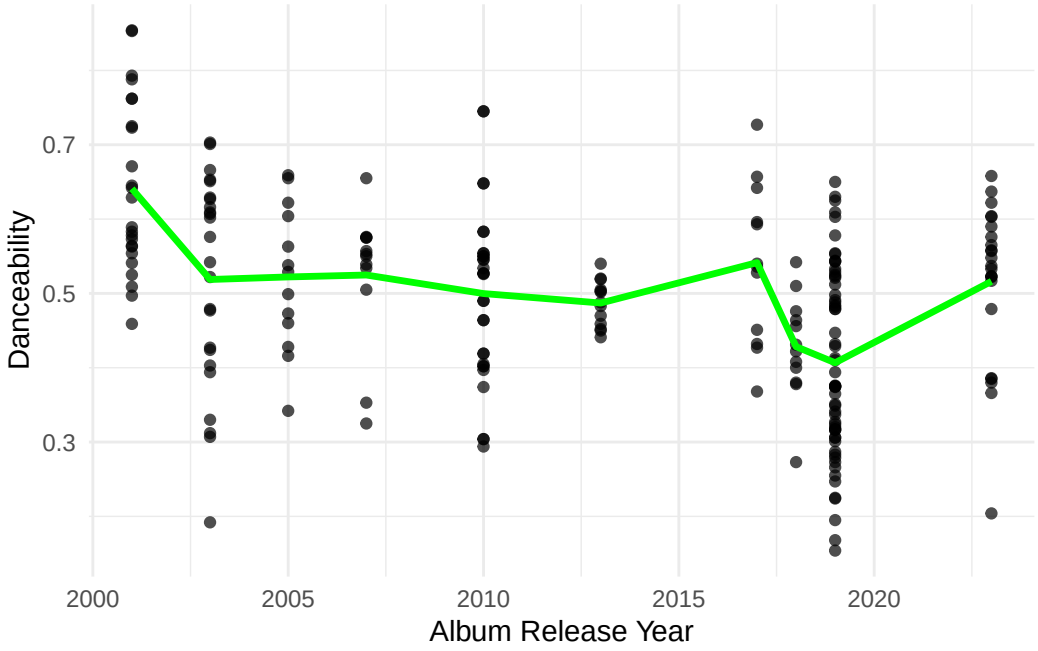

Figure 1: Danceability Over Album Release Years

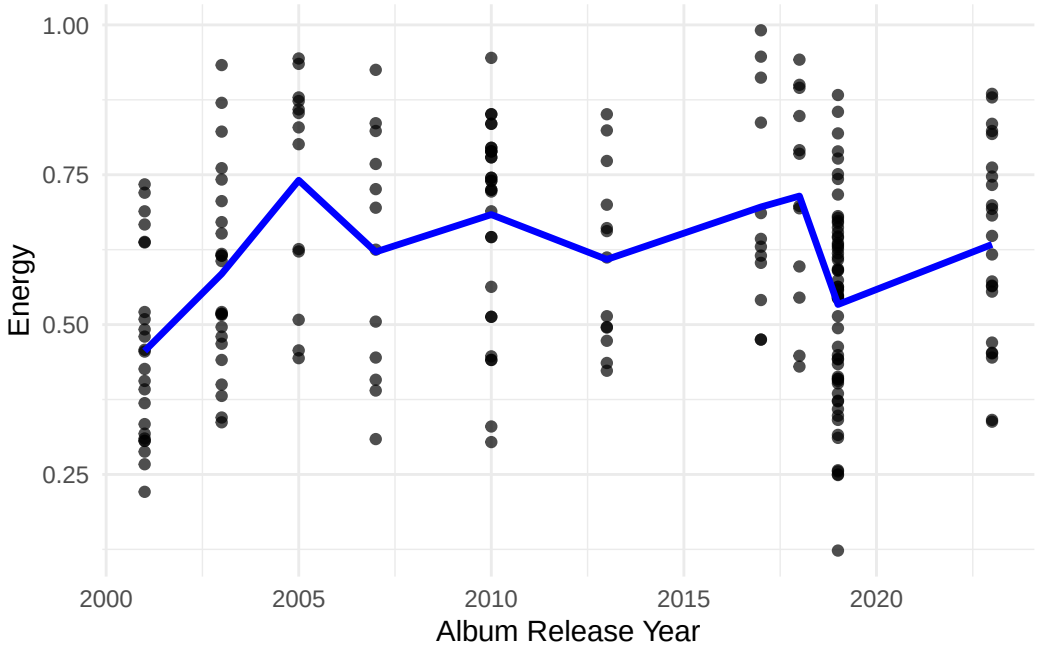

Figure 2: Energy Over Album Release Years

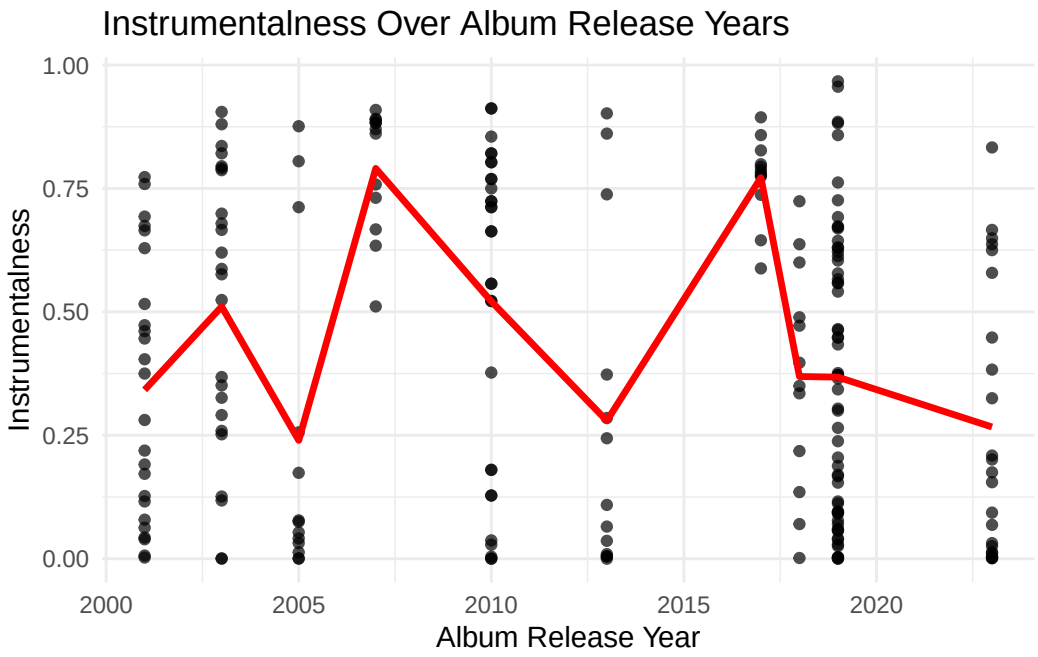

Figure 3: Instrumentalness Over Album Release Years

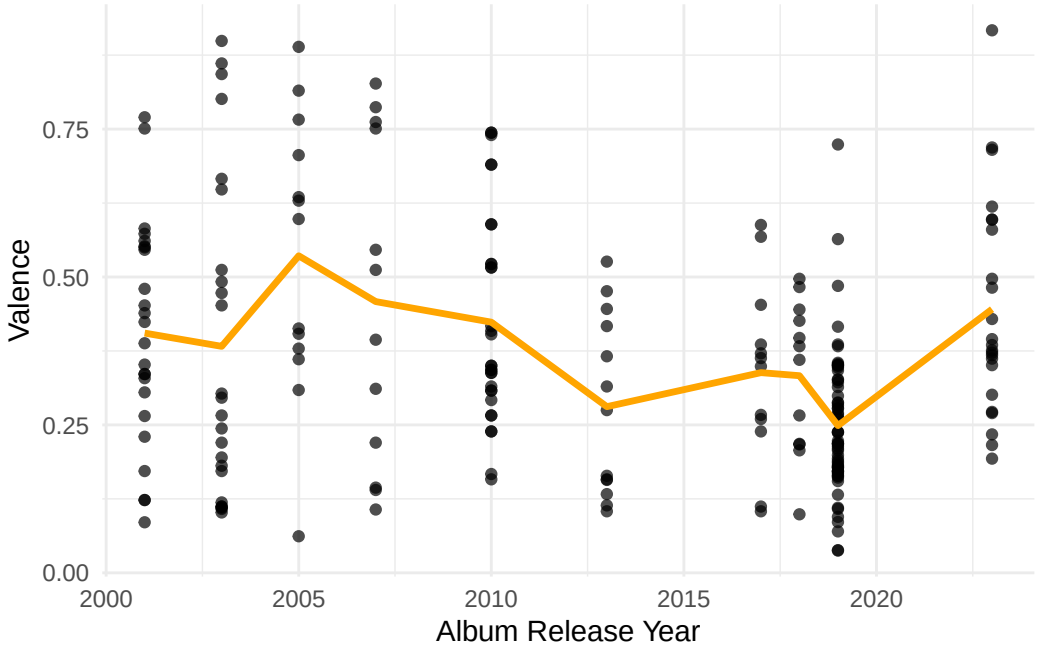

Figure 4: Valence Over Album Release Years

Müller, Kirill, and Lorenz Walthert. 2023. *Styler: Non-Invasive Pretty Printing of r Code*. https://github.com/r-lib/styler.

R Core Team. 2023. *R: A Language and Environment for Statistical Computing*. Vienna, Austria: R Foundation for Statistical Computing. https://www.R-project.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*. https://dplyr.tidyverse.org.