

# Exploring the prominence of specific musical features in music listened by children of different age groups.

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## Background:

- Listen to music plays an important part in the everyday life of adults as children.
- With the ever increasing amount of music, recommender systems are needed to help users discover music similar to what they like.
- Unfortunately, most research on music habits and preferences has been conducted among adults, meaning that research centered around children, which is a very different demographic, still remains sparse.
- To bridge this gap, some papers have set a strong baseline in improving the understanding of children's listening habits, by analyzing feature prominence among children of different age groups.
- Many features remain unexplored, so further research is needed in this area.

## Research question:

To what extent do some song features influence the listening habits of children of different age groups?

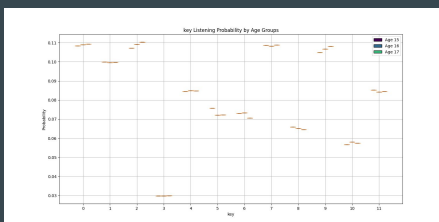
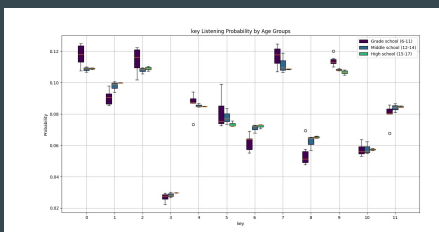
## Methodology:

- The main goal is to analyze the prominence of three chosen song features: key, time signature, and micro-genre.
- The research aims to find connections between children's age groups and feature prominence.
- Data collection involves using the LastFM-2b music dataset, which includes user age, listening events, and track features.
- The dataset is expanded with the Spotify database to include additional features like key and time signature.
- The improved dataset combines key, time signature, and micro-genre features with user age groups.
- Age groups are categorized based on education levels: Grade School (ages 6-11), Middle School (ages 12-14), and High School (ages 15-17), as well as individual ages of High School following approaches supported by previous research.

## Results:

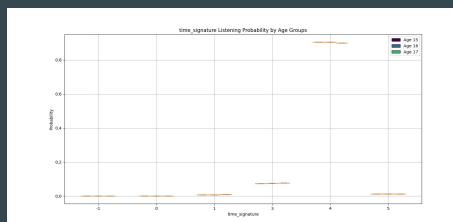
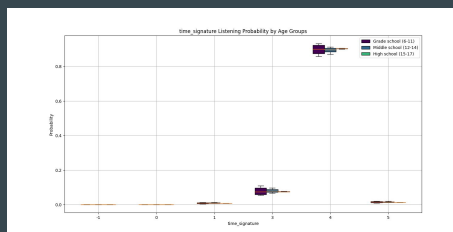
### Key Prominence:

Grade school children show a high frequency of keys C, D, G, and A. Middle school children follow the same pattern, with slight increases in C#, F#, and G#, and a decrease in F. High school children show similar patterns to middle school, with a slight decrease in F's frequency as age increases.



### Time Signature:

Time signature distribution shows higher variability in grade school, with 4/4 and 3/4 being most prominent. Over 90% of listening events across age groups are in 4/4, with 3/4 being the second most common at about 10%. Variability in time signature use decreases with age, becoming negligible in high school.

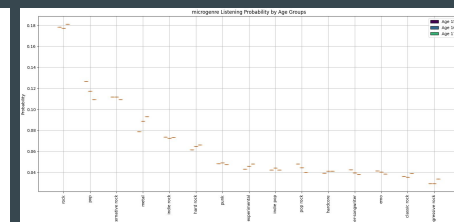
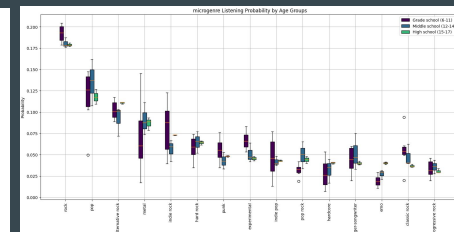


## Conclusions:

The research explored the prominence of song features (key, time signature, and micro-genre) among children of different age groups to enhance understanding of their listening habits. Findings showed that over 30% of listening events for children aged 6-17 are in the keys C, D, G, and A, with high school students showing slightly more varied key preferences. About 90% of listening events are in the 4/4 time signature, with negligible differences across age groups. Rock and pop are the most prominent micro-genres, accounting for about 30% of listening events, with sub-genres of rock also popular. Listening habits become more uniform as children grow older, with high school students showing less variability. The research contributes to understanding musical preferences among children and highlights the importance of key, time signature, and micro-genre in music recommender systems. Future research could focus on the relationship between song popularity and age, and explore the appropriate age for predictive algorithms, incorporating child psychology to better understand preferences.

### Micro-Genres:

The top 15 micro-genres for ages 6-17 include rock, pop, alternative rock, and metal. Rock is the most popular genre across all age groups, with variability decreasing as age increases. Grade school children show the highest variability in metal, ranging from 2% to 14%. Middle school and high school children show consistent patterns, with rock, pop, and alternative rock being the most prominent. Metal listening increases with age, while pop listening decreases slightly in high school.



## References:

1. Spear, Lawrence, Ashlee Milton, Garrett Allen, Amifa Raj, Michael Green, Michael D. Ekstrand, and Maria Soledad Pera. "Baby Shark to Barracuda: Analyzing Children's Music Listening Behavior." In *Proceedings of the 15th ACM Conference on Recommender Systems*, 639–644. RecSys '21. New York, NY, USA: Association for Computing Machinery, 2021.

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