Personality Correlates of Music Audio Preferences for Modelling Music Listeners

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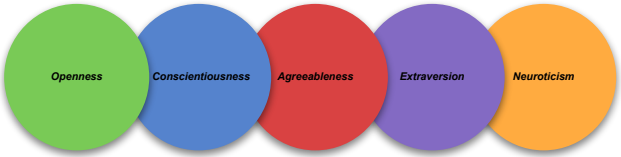
Introduction

- Personality has significant associations with music tastes.
- Past studies considered genres or styles as music preferences.
- In this paper, music preferences are expressed in terms of audio features such as:
  - Energy
  - Loudness
  - Tempo
  - etc.
- Personality is expressed through the five-trait (OCEAN) model.
- **Are there significant correlations between listeners' personality traits and the audio features of the music they listen to? And if so, how strong are these correlations?**
- Example application: Cold-start scenario in music recommendation systems.



Data Acquisition and Processing

- Dataset containing personality and listening history of 1,470 users. 35 million listening events and 2.5 million tracks with audio features.
  - Subset of the MyPersonality dataset.
  - Listening histories are crawled from Last.fm.
  - 12 Audio features are retrieved from Spotify.
- Reduced to 1,346 users for ensuring quality of the results (see later).
- Dataset is publicly available[1].

- Acousticness
- Danceability
- Duration
- Energy
- Instrumentalness
- Liveness
- Loudness
- Speechiness
- Tempo
- Valence
- Mode
- Popularity

1] https://gitlab.cp.jku.at/alessandro/pers-corr

Methodology

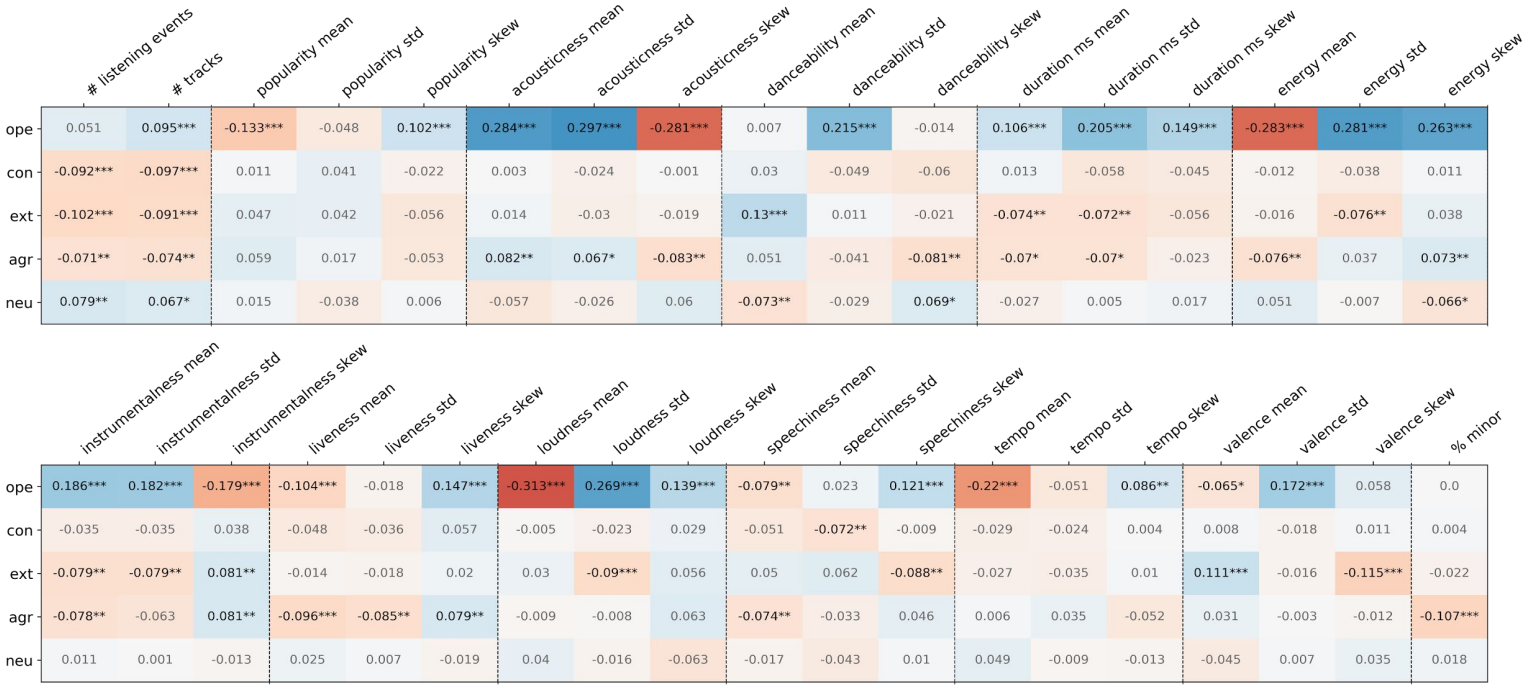
- For each user we build a **music preference profile**.
  - We aggregate the audio features of the tracks the user has listened to.
  - For each feature, we compute the mean, standard deviation, and the skewness. For binary features, we compute the percentage.
  - Tracks listened multiple times will contribute more than tracks listened only once.
- We ensure a minimum number of listening events per user.
  - Drop all users with fewer than 30 listening events.
- We then analyse the relationship between the traits and the aggregated audio features.
  - Spearman's correlations with confidence values 5%, 1%, 0.1%.
  - False Discovery Rate (FDR) with q-value 5%.

$track_1, track_2, track_3, \ldots$

(mean, std, skew) x feature

mean feat. 1	std feat. 1	skew feat. 1	...
3.5	0.01	0.2	...

Results



* p < 0.05, ** p <0.01, *** p < 0.001. p-values adjusted with FDR at q-value of 5% .

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Conclusion and Future Work

- There are significant correlations between listeners' personality traits and the audio features of the music they listen to.
- Future work:
  - Predict the personality of the user from listening behavioural data.
  - Quantify the effect of personality in both cold- and warm-start scenarios in music recommender systems.
  - Study if users with different personality are treated equally by recommender systems.

Thank you for your attention!