

## Exploring the role of Audio and Lyrics in Explaining Moral Worldviews

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### Introduction

Music is a form of expression and part of the holistic human experience affecting our emotions and cognitive performance. People listen to music that reflects their personality needs (Anderson et al., 2021) and resonate with their basic human values. Our research explores the less attended relation between moral values and music preferences. We previously found that by analysing the lyrics of one's preferred artists, reliable inferences about that individual's moral values can be made (Preniqi et al., 2022). Building on Tagg's socio-semantic view of musical meaning (Tagg, 2013), here we hypothesise that audio features, too, play an important role in understanding how people align their music preferences with moral worldviews. The goal of this study is twofold: to explore the extent to which moral values are reflected in the audio of one's favourite music; and to examine how audio and lyrical features predict, separately and together, moral traits of listeners.

### Methods

We operationalise morality via the Moral Foundations Theory (MFT) (Graham et al., 2013), which postulates five moral traits: Care, Fairness, Loyalty, Authority, and Purity. These can further collapse into Individualising and Binding foundations. Here we harvested data from a Facebook-hosted research-only app (Preniqi et al., 2022) to align MFT scores of 1,480 users to audio and lyrics features from the top 5 songs of their preferred music artists as emerged from Facebook Page Likes. We used high- and low-level audio features from Spotify (e.g., valence, mode, acousticness, timbre) and extracted lyrical features like topics, emotions, morals, and valence using natural language processing. Regression models were trained to infer MFT scores from audio features only and from integrating audio and lyrical content in a multimodal framework.

### Results

We found that those who value empathy and equality preferred music with smooth and low-arousal melodies. Whereas virtues of tradition and hierarchy were linked to more upbeat, energetic, and rhythmic songs. Timbre was an overall good predictor of Binding values, while pitch classes were a significant predictor of Individualising values. Overall, audio features were significantly better than lyrical features in inferring Individualising values but marginally better for Binding values. Multimodal models were the most effective in predicting MFT traits.

### Discussion

Our study can serve as a guide for future research in understanding how music can be used to stimulate and influence people in social and political contexts. Also, our implications can help to increase awareness on how our music listening habits may reveal information about our values and behaviours.

### Conclusion

The findings suggest that information in the audio and lyrics of one's favourite artists allow, to some extent, reliable inferences about their moral values and worldviews. Such knowledge can be directly implemented in psychologically aware music recommendation systems, improving personalised music experiences and more broadly contributing to listener's well-being.

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