Functions of music listening mediate relationships between MIR-generated audio features of listeners' music selections and concurrent listening activities

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Introduction

Through increased ease-of-access, brought about by portable listening technologies, music may now be applied in almost any setting, at any time, which holds implications for the ways music is used by listeners (e.g., Krause et al., 2014). When people listen, they select music that 'fits' the situation in response to contextual goals. This study triangulated three constructs: activities accompanying music listening, functions of music listening (FML), and audio-features of listeners' music selection in everyday listening episodes. We aimed to assess if activities accompanying music listening and FML lead to changes in the audio features of music selection.

Methods

An online survey (n = 436) and Experience Sampling Method (ESM) study (n = 81) were conducted, from which 875 listening episodes were retained in a final, partially nested data structure. We assessed whether listeners' activity influenced the audio content of selected music directly and indirectly, through FML. Activities acted as predictors, FML as mediators, and audio-features (obtained from the Spotify API) as outcome variables, following reduction via Principal Component Analysis (PCA). This structure was fit in a path model, and design-based adjustments were made to accommodate the complex data-structure.

Results

Listening activities led to observed changes in the audio-features of listeners' music selections, both directly and indirectly through FML. Examples include negative indirect effects of Work/Study on *Arousal* and *Valence*, via the factor *Focus and Concentration*. Exercise led to increases in *Arousal* via the *Physiological Arousal* factor, as did the effect of Work/Study on *Instrumentalness*. Socialising and Travelling directly led to lower levels of *Instrumentalness* and *Valence* respectively.

Discussion

There was evidence that listening activities influenced the audio content of participant's music selection, however, this was not ubiquitous across activities, with some leading to more substantial changes than others. However, these results support extant literature that situational characteristics influence the audio-features of music selection in everyday life (e.g., Greb et al., 2019), and extend such findings by using MIR-generated audio features instead of self-reported perceptual ratings of musical characteristics. The nature of the observed effects aligns with wider literature, such as that music during work or private study requires lower degrees of arousal or higher instrumental content, and that Exercise often requires fast or energetic music (e.g., Lamont et al., 2015).

Conclusion

Our findings outline the influence of context on music selection. One avenue of future work could be to apply psychological findings such as this into the generation of psychology-informed music recommender systems. To our knowledge, this is the first study to assess how observable changes in MIR-generated audio-features of music selection is subject to contextual and functional variables in cross-sectional data. Expanding such methods may help mitigate the dependency of existing systems on users' interaction data (e.g., Lex et al., 2021).

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