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Mood Music: Combining Spotify data with Ecological Momentary Assessment to explore mental health

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Introduction & Background

Music listening in the modern age primarily occurs through streaming platforms such as Spotify (∼626 million users). Naturalistic 'big data' produced by individuals' interactions with these platforms provides a novel opportunity to consider music listening beyond the artificial lab setting, and to combine this with mood and mental health records.

Objectives & Approach

The Mood Music study was conducted at the University of Bristol to investigate the use of music listening as a proxy for wellbeing. This study included three forms of data from a sample of 171 university students: Ecological Momentary Assessment (EMA), Spotify streaming history, and mental health survey measures (including depression (PHQ-9), anxiety (GAD-7), and wellbeing (SWEMWBS)). Ethical approval was granted by the University of Bristol, and the analysis plan preregistered on OSF.

Relevance to Digital Footprints

Spotify streaming history data is produced by individuals' interactions with the platform, including the timestamp of their listening, the songs they choose to listen to, and the musical characteristics of these tracks. As such, this data acts as a digital trace of individuals' behaviour. By linking this to individual mood data at four daily time points, we can relate real-time listening activity and mood.

Results

This study contains survey and EMA data on 171 participants, of which 163 have Spotify streaming data available (total tracks=4,061,696). The streaming datasets were 'hydrated' with 15 audio, track, and artist variables (e.g. track tempo, artist popularity) using Spotify's API. The EMA dataset contains 7520 unique mood records, covering 5 mood variables assessed at 4 daily time points over 2 weeks. We will present details of the music listening patterns, including diurnal and seasonal trends, and link these to mood and mental health.

Conclusions & Implications

Results suggest that Spotify data is a useful source of real-time information about mood, and that music listening practices reflect people's responses to real-world events. Using this dataset to understand the time-sensitive links between music listening, mood, and mental health has the potential to inform digital health intervention and prevention strategies using 'flags' in listening behaviours to identify low mood in real-time, without relying on self-report.

Keywords

Spotify streaming history, Ecological Momentary Assessment, music listening, mood, mental health

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