Validating Emotions Evoked by Mindful Music

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Research Questions

RQ1: Do pieces of music designed to induce specific emotions reliably evoke them in listeners?
If yes, they can be used for mood induction and regulation (e.g. [vdZ+13])

RQ2: Do these emotions vary by cultural background?
If yes, culture-specific music needed.

Does Culture Affect Emotion Associated With Sound?

The International affective digitised sounds (IADS) database [BL99] consists of 167 sounds rated according to the PAD model (valence, arousal, dominance) using Self-Assessment Manikin (SAM, 9-point scale, 1 low - 9 high). Normative values for emotions evoked by stimuli for listeners from countries are highly correlated, but there may be systematic differences, e.g. [RFPP08] (Spanish vs US norms); [YM+18] (Japanese vs. American participants; Japanese rate stimuli less positive); [SP+13] (European Portuguese; arousal lower than Spanish).

Fig. 2: Valence and Arousal Ratings for Pilot 2
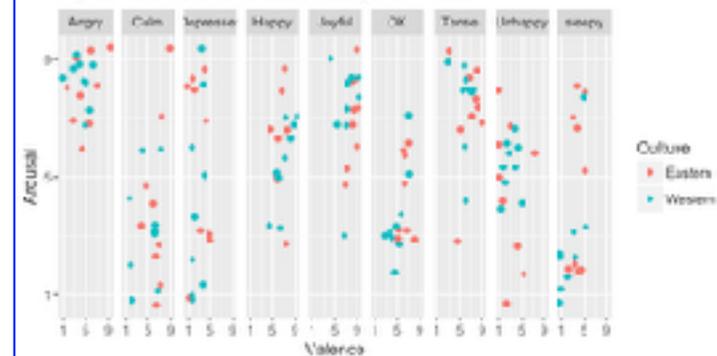
Background: Soulight

Musical mindfulness app (Fig. 1) by Musemantik that allows users to log their mood, explore their mood, and take journeys from one mood to the other, using specially composed instrumental music. In RCT (n=67, 31 Soulight as needed, 36 waitlisted), no effect on mood (I-PANAS-SF, [T07]), but app was usable and helpful [WM16].

Pilot 1: The Corner Emotions

Stimuli: Angry, Joyful, Calm, Depressed (2 minute sounds) - high/low valence x high/low arousal.
Procedure: Participants listen to music while seeing associated Soulight colour on screen, complete Valence and Arousal SAM while neutral images are shown.
Latin square Design
Participants: 8 Eastern (Chinese), 8 Western
Results: No diff. between East and West; arousal as expected, valence: joyful M=8, angry / calm M=5, depressed M=2

Discussion and Physical Installation

Ratings and mental images vary between participants. For some, reactions are closely linked to their own listening patterns and specific experiences, consistent with literature (e.g., [BKT16,S16]). Personalisation can make regulation and induction through music more reliable (e.g., mental wellbeing)

A physical installation (Video: https://youtu.be/idPUlf04sTQ) allows people to explore findings from both pilots about the links between colour, music, and evoked mental images / experiences.
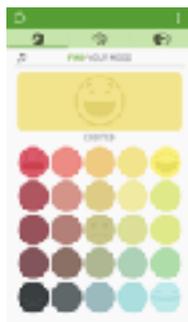
Fig. 1: Soulight Entry Screen.

Upper: currently selected mood, lower: moods by arousal x valence

http://soulightapp.com

Pilot 2: Emotions and Colours

Stimuli: Angry, Tense, Unhappy, Joyful, Happy, Calm, Sleepy, Depressed, OK
Procedure: Participants listen to music, perform SAM, name emotion, pick associated colour, and explain their choices
Participants: 9 Eastern, 9 Western; Latin square
Results: Eastern participants tend to rate valence higher (M=5.4, SD=2.3) than Western (M=4.8, SD=2.2); no difference on arousal. Significant effect of music type (Fig. 2), no interaction culture/music. Pilot 1 findings replicated. For colour results, see [Y18].

Future Work

Ongoing study: Validation of new versions of „corner emotions" composed for Musemantik in a large online study, across countries (US, UK, India, China) and within country, controlling for sex

Planned studies:
- comparison of selected instrumental music stimuli from IADS-2 / IADS-E [YM+18]
- Validation of musical journeys for mood regulation (e.g., from depressed to joyful)