Empathy contributes to the intensity of music-induced emotions

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ABSTRACT

Background

It has been proposed that music-induced emotions emerge from the interplay of listener attributes, situational factors, and the music itself (Scherer & Zentner, 2001). Thus, different people react differently to a given piece of music, and even the same person may react differently in different situations. It has been suggested that some form of empathy may be involved in the emotional responses induced by music (e.g., Scherer & Zentner, 2001), but the possible contribution of trait empathy is yet to be investigated empirically.

Emotional contagion has been suggested as one of the mechanisms through which music can induce emotions in listeners (Juslin & Västfjäll, 2008). Links have been established between trait empathy and emotional contagion in general (e.g., Doherty, 1997), but it remains to be investigated whether trait empathy also enhances emotion contagion through music.

Aim

The aim of the present study was to investigate whether trait empathy contributes to the intensity of emotions induced by music. It is hypothesized that those high in trait empathy would be more susceptible to emotion contagion through music, and thus experience more intense emotions in response to music.

Method

The possible contribution of empathy was investigated by analysing the results of two separate experiments. In Experiment 1 (for details, see Vuoskoski & Eerola, 2011), 131 participants listened to 16 film music excerpts and evaluated the intensity of their emotional responses and how much they liked each excerpt. As self-reports are vulnerable to demand characteristics and rely on the accuracy of participants' introspection, another experiment was designed to investigate music-induced emotional states as objectively as possible. In Experiment 2 (for details, see Vuoskoski & Eerola, 2012), 60 participants were randomly assigned to two groups: The sad music group listened to 8.5 minutes of unfamiliar, instrumental music that had previously been validated as sad, while the neutral music group listened to 8.5 minutes of unfamiliar, instrumental music that had previously been rated as neutral. The participants were told that the objective of the study was to investigate the effect of music listening on cognitive processing. The induced emotions were assessed using two indirect measures of emotional states; a word recall task, and a facial picture judgment task where the participants had to evaluate the emotions conveyed by ambiguous and prototypical facial expressions. The facial pictures were evaluated using 5 rating scales (happiness, sadness, fear, anger, and neutrality) ranging from 1 (e.g., *not at all happy*) to

7 (e.g., *very happy*). According to the associative network theory of affect (Bower, 1981), emotional states bias the interpretation and recollection of emotional material in affect-congruent directions.

In addition, free descriptions about the participants' thoughts and impressions during the music listening were collected in the end of the experiment. In both experiments, trait empathy was measured using the Interpersonal Reactivity Index (IRI; Davis, 1980); a self-report measure that divides the global concept of trait empathy into four subscales: *Fantasy, Empathic Concern, Perspective-taking,* and *Personal Distress.*

Results

In Experiment 1, the trait empathy subscale *Fantasy* correlated with the self-reported intensity of emotions experienced in response to tender ($r = .19$, $p < .05$) and sad ($r = .19$, $p < .05$) excerpts. *Fantasy* and *Empathic Concern* were also associated with liking for sad ($r = .28$ and $r = .23$, both $p < .01$) and tender music ($r = .34$, $p < .001$ and $r = .25$, $p < .01$), respectively.

In Experiment 2, the word recall task did not reveal any significant differences between the neutral and the sad music group. However, the results of the facial expression judgment task indicated that trait empathy was strongly associated with induced sadness (in the sad music group). Global empathy as well as the subscales *Fantasy* and *Empathic Concern* correlated significantly with the mean sadness ratings (for facial expressions) in the sad music group – indicating a judgment bias towards sadness – but not in the neutral music group. The correlations are displayed in Table 1.

Table 1. Pearson correlations between mean sadness ratings for facial expressions and trait empathy (and its subscales).

	Mean sadness ratings	
	Sad music	**Neutral music**
Empathy (global)	**.63*****	-.08
Fantasy	**.54****	-.21
Empathic concern	**.48****	.25
Perspective-taking	.27	-.12
Personal distress	.07	-.01

**$p < .01$, ***$p < .001$

We proceeded by investigating the participants' general judgment bias on the sad–happy continuum. Affect models typically characterize happiness and sadness as diametric opposites (e.g., Russell, 1980), and as there were an equal number of prototypical and ambiguous (mixed) facial pictures expressing sadness and happiness, the participants' mean sadness ratings were deducted from their mean happiness ratings. A 2 x 2 factorial ANOVA was carried out to

investigate the main and interaction effects of condition (sad/neutral music) and level of empathy (median split) on the combined sadness-happiness -ratings. The analysis yielded no main effects of condition ($F[1,56] = 1.25$, $p = ns$) or level of empathy ($F[1,56] = 0.77$, $p = ns$), but the interaction effect was significant ($F[1,56] = 5.06$, $p < .05$). Figure 1 illustrates that the high-empathy participants in the sad music group displayed a significant judgment bias towards sadness, while the low-empathy participants (and all the participants in the neutral music group) did not display a judgment bias.

Figure 1. The mean judgment biases (± standard error of the mean) in the combined sadness and happiness ratings (for facial expressions) of participants scoring high and low in trait empathy (median split). Positive values signify a judgment bias towards happiness, and negative values signify a bias towards sadness.
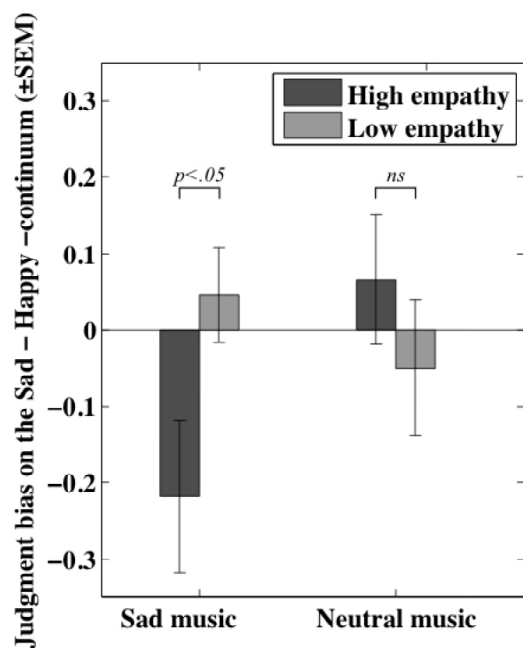
Finally, the content analysis of the free responses revealed that the vast majority (90%) of the participants in the sad music group did not report thinking about any personal memories during the music listening, while 23% reported thinking about sad imagery.

Conclusions

Trait empathy and/or its subscales were associated with the self-rated intensity of emotions induced by sad and tender music, as well as with the susceptibility to music-induced sadness. The results suggest that trait empathy may indeed enhance the induction of emotion through music – at least in the case of certain emotions. Highly empathic people may be more susceptible to music-induced sadness and tenderness, possibly reflecting their tendency to feel compassion and concern for others. The results also suggest that trait empathy may interact with the *emotional contagion* –mechanism of music-induced emotions (see Juslin & Västfjäll, 2008), as the unfamiliar sad music managed to induce a sad emotional state in empathic participants without any apparent contribution from autobiographical associations or episodic memories. Furthermore, the participants were not aware that the

experiment was about music-induced emotions, thus limiting the possibility of deliberate attempts to change one's emotional state with the help of music.

Empathy was also associated with the enjoyment of sad and tender music, further suggesting that trait empathy may play an important role in musical engagement. Interestingly, it appears that those who experience more intense sadness in response to sad music also like sad music more. Further research is encouraged to explore the mechanisms behind the enjoyment of music-induced sadness, as this seems to be associated with empathy. Future studies should also investigate the role of empathy in other music-induced emotions – especially tenderness and other positive, low-energy emotions – as well as in music making.

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