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The Effect of Music Interventions on Empathy in Adolescents and Young Adults

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ABSTRACT

Music interventions, in which individuals receive either music therapy, music training, or music listening, have been shown to influence the development of many cognitive and emotional traits. This review specifically examines the relationship between music interventions in adolescence and the development of empathy. Empathy is the cognitive capacity to understand the emotions of others, the emotional capacity to feel on behalf of others. Seven studies that tested the effect of music intervention on empathy were selected. Empirically, experiments found music intervention to be an effective and positive moderator of empathy levels. Music interventions positively impacted all components of empathy, namely, cognitive, affective, and motivational. It was also suggested that active music intervention, such as music therapy, is more effective than passive interventions like music listening. However, since all current studies only tested for temporary effects, future investigations should aim for longitudinal designs to test if such effects are permanent. In addition, more research is required to determine exactly with the causal mechanism is between elements of music and empathy.

Introduction

Empathy is an emotion that involves three dimensions: cognitive, affective, and motivational. The cognitive component involves understanding what other people feel. The affective component involves feeling other people's emotions. Lastly, the motivational component involves being motivated to alleviate the distress of others (Decety, 2015). The Interpersonal Reactivity Index (IRI), one of the most commonly cited measurements of empathy, breaks down empathy into four distinct abilities: perspective-taking (to adopt another's point of view), empathic concern (to feel sympathy or compassion for those in need), personal distress (to experience the distress of others), and fantasy (to imagine oneself in a fictional situation) (Stocks & Lishner, 2012). Neuroimaging techniques have discovered the recruitment of several brain regions in response to the emotions of others: the brainstem, amygdala, insula, and orbitofrontal cortex (Hamann, 2012). Empirically, empathy is associated with prosocial behavior, altruistic motives, and morality (Decety, 2015; Stocks et al., 2009). Empathy levels are determined by both genetic and environmental factors (Knafo et al., 2008). The development of empathy is particularly important during adolescence, as empathy is a major predictor of social competence in adulthood (Allemand et al., 2015; Yoo et al., 2013).

Music is a universal art form, a ubiquitous presence throughout the history of human lives. In the past decades, music has been empirically researched from a therapeutic perspective. Studies suggest music and musical activities promote social and emotional development (Wu & Lu, 2021). Most current research on the effects of music interventions on empathy has focused on young children; further studies examining adolescents—who are in a critical period for developing empathy—should be conducted (Bolger & Hunt, 2018). This review identified seven studies that investigated the general question of the effect of music interventions on empathy in adolescence and young adulthood. Of these, two investigated the effects of music listening, a passive form of music intervention, and five investigated the effects of music therapy/training, an active form of music intervention.

This review will go through the studies and explain the current state of the research regarding the effects of active and passive music interventions on the development of empathy in adolescents. Finally, the limitations of the research and suggested future areas of exploration will be discussed.

Passive Music Intervention — Music Listening

Music listening is one of the most popular leisurely activities. On average, teenagers listen to music 2.45 hours per day, demonstrating the significance of music listening in adolescence as a topic worth investigating (North et al., 2000). Colverson et al. (2021) and McDonald et al. (2022) investigated the effect of music listening and empathy in adolescence. They found that music listening improved empathic decision making and empathy levels, suggesting that passive listening to music alone affects empathy.

Empirically, the effect of music listening on empathic decision-making was investigated by Colverson et al. (2021), who tested 60 young adults from a school in the Southeastern US. The subjects listened to either Brazilian, classical, or no music while playing Cyberball, a digital game that required empathic decision-making. Results found that empathic decision-making increased when listening to Brazilian and classical music, and the genre of music did not have a statistically significant impact. The working mechanism could be the parallel processes between music listening and empathy. While music transmits a powerful emotional message from the abstract composer/performer, which the listener can affectively receive and cognitively interpret, the listener remains a distanced observer (Kalliopuska & Ruokonen, 1993). This mirrors the relationship of empathizing, whereby one maintains one's distinct self while empathizing with another. This suggests music-listening to be a facilitator of empathic decision making.

In addition, McDonald et al. (2022) supported this finding by investigating the effect of listening to emotional music on empathy and theory of mind (ToM), which is associated with the cognitive aspect of empathy. Sixty participants participated in this online study. They completed an EmpaToM task, which involved watching a 15-second clip of a person recounting an autobiographically neutral or negative memory with either neutral or negative valence film music playing in the background. Then, participants were tested for their empathy and theory of mind levels. Results showed that listening to emotional music increased empathy levels, but not ToM, for the negatively emotional video clip. The findings imply that music listening relates significantly to affective empathy. It has been theorized that the auditory and gestural features in music induce emotional contagion through pre-conscious motor simulation (Vuoskoski et al., 2017). The elements that constitute a piece of music involve acoustic codes that imitate those of expression, and the rhythmic and speed aspects correspond with human movement. This way, it is possible that empathy was evoked through affective and motor resonance. In this case, the emotional music may have enhanced corresponding moods within the participants.

Active Music Intervention — Music Therapy and Music Training

Music therapy is the clinical and evidence-based use of music interventions to accomplish therapeutic goals within a therapeutic relationship (*What is Music Therapy?,* 2005). The music therapy in the sampled studies was active therapy, which engaged subjects in music recreation, improvisation, and composition activities. It may be argued that this form of music intervention yields better results in increasing the motivational aspect of empathy in addition to the cognitive and affective, compared to music listening. Five studies, Dos Santos (2018), Huang & Gu (2024), Cuervo & Campayo (2024), Kiarostami et al. (2022), and Mellizo (2019) examined the effects of direct music interventions on the empathy of adolescent subjects. The studies in our sample found that music therapy had a statistically significant positive effect on the development of empathy.

Dos Santos (2018) investigated group music therapy and its effect on empathy in aggressive teenagers via a phenomenological study. Six volunteering teenagers from Eersterust, South Africa, were rated by teachers as most frequently engaged in aggressive altercations. Most of the participants were victims of trauma and abuse. Eleven

sessions were conducted. The researcher employed a humanistic approach, focusing on the themes initiated by participants. Sessions were videotaped for behavioral analysis. The researcher concluded that, at least within the confines of the sessions, the participants experienced heightened empathy and lowered aggression. In adolescence, low empathy is often manifested in aggression (Cohen & Strayer, 1996; Lovett and Sheffield, 2007). Hence, this finding underscored the efficacy of music therapy, considering the high initial level of aggression in the sample. Dos Santos also observed that the sessions provided participants a refuge where painful and traumatic experiences could be authentically expressed, the uniqueness of suffering was reduced for the marginalized students, and the the students' sense of emotional safety increased. This finding highlights the function of group music therapy for social bonding and acceptance by providing an environment for safe and mutually beneficial exchanges. Such a setting may be especially crucial to adolescence, marked by an increasing need for peer support (Tan et al., 2016). Thus, in particular, music therapy may have positively affected the motivational component of empathy and positively reinforced empathic efforts.

Kiarostami et al. (2022) further corroborated these findings by testing the effect of music training on empathy, cognitive flexibility, and aggression. The researchers tested 30 male high school students in Iran. They found that the experimental group, which received eight sixty-minute music training sessions over four weeks, had statistically significant improvements in the IRI. The sessions involved the participants in individual and group music-making as well as learning to interpret and express the emotional message in the music. The results found that the sessions positively affected empathy levels, specifically empathic concern, perspective-taking, and personal distress, relative to the control group. The study also found that aggression was significantly reduced in the experimental group. The sessions, at their core, were a simulation of the process of empathy: participants were trained to actively listen, interpret, and replicate the emotional message from the music. This exemplifies the usefulness of music as a tool and vehicle for empathy training through strengthening emotional literacy. Moreover, as aggression was reduced, the researchers suggested that music training can increase peacefulness, relaxing the "ego boundary" (Freedberg et al., 2007, p. 254), which facilitates acquiring higher empathy levels.

A recent study that supported the benefits of music training in a group setting was Cuervo & Campayo (2024), in which the effect of creative music trainings of composition and improvisation activities on students' empathy was investigated. The sample consisted of 63 students aged 13 from a school in south Madrid with low to middle-income families. The experimental group received music education through collective composition and improvisation activities, during which participants were trained to closely examine and authentically interpret emotional messages from musical and non-musical stimuli (such as opinions and images). Participants took the IRI questionnaire before and after the nine months of music learning to measure empathy. The results showed significant improvements in the experimental group's empathy level relative to the control. Once again, the study revealed the effects of music-making on empathy. On the one hand, the activities created good opportunities and motivations for the participants to socialize and synchronize, strengthening the mirror neuron system and enhancing empathy (Wu & Lu, 2021). On the other hand, the sessions emphasized creativity, an integral element of perspective-taking.

Furthermore, Huang & Gu. (2024) found the same positive effects on students with mild intellectual disabilities. The study examined the effects of music therapy on adolescent's emotional regulation and empathy levels with 120 students with mild intellectual disabilities. The experimental condition received nine months of regular music therapy sessions, including individually expressive and group activities. At the end of the experiment, empathy and emotion recognition were tested while the experimental group listened to ethnic or classical music. They found that the experimental group demonstrated significant improvements in empathy towards the elderly, strangers, cartoon and movie characters, and animals, but not children and parents. Participants recognized emotions with more depth and more accurately than the control group. This finding is significant since emotional recognition is a crucial cognitive process of empathy. The study demonstrated the practical benefits of music therapy as a non-invasive technique for empathy and, notably, in children with intellectual disability.

Lastly, the positive impact of music intervention in empathy can also be found in the context of cultural understanding. Mellizo (2019) tested if music training can affect adolescents' Intercultural Sensitivity (IS) with a

highly immersive, culturally diverse 12-lesson program, as IS is found to be strongly linked with empathy, and empathy often enhances IS. 139 students aged 9-13 were sampled from four public schools in the Rocky Mountain region of the US. Based on the traditional music of southern Benin, a twelve-lesson, highly immersive music curriculum was administered. An age-adapted version of the Intercultural Sensitivity Index questionnaire was taken before and after. Ten students were chosen to participate in semi-structured interviews through a stratified sampling method. After the experiment, students scored significantly higher for ISI, and the qualitative data mostly supported this finding. This exemplified music training's effect on empathy in an intercultural context since music seems to possess universal qualities that transcend cultural boundaries.

Discussion

Overall, the research suggests that music intervention, in the form of either music listening, music therapy, or music training, is associated with the development of empathy in adolescents and young adults. It was found that music has significant potential to impact empathy levels in various ways. Music embodies emotional messages, allowing for a simulatory experience for receiving emotional messages from humans, which can help to train empathy cognitively. Music's ability to exert an emotionally contagious effect enables adolescents to experience affective empathy firsthand. Music in curriculums also helps to set up an ideal environment for empathy learning since it can reduce aggression, enhance mood, and develop a sense of group synchrony and bonding. In the samples, music therapy and training, employed as an active music intervention, seemed to have the potential to simultaneously benefit all three components of empathy—cognitive, affective, and motivational. In comparison, music listening as a passive intervention might have little relation with the motivational component. Most of the studies used a standardized procedure and surveys, which yielded appropriate construct validity, and samples of various regions and backgrounds were tested to support generalizability.

There are several limitations to this research. While the empirical evidence generally supports the relationship between music and empathy, the exact functioning mechanism is unclear, and the studies could have produced more nuances. For instance, although Colverson et al. (2021) provided reasonable data that revealed a positive relationship, the cause of the effect could only be inferred. Further neuroimaging research should be conducted to better understand structural and systematic changes within the brain. In addition, Dos Santos (2018) lacked quantitative data and had a very small sample size, which limits its generalizability. It should also be noted that Dos Santos took the role of both the music therapist and researcher, which subjected her to researcher bias. Furthermore, it was expected that within a music therapy curriculum, multiple methods and activities were employed altogether. Further research could isolate each means to test the effect of different methods. Similarly, tests could be conducted to disambiguate the cognitive, affective, and motivational components of empathy.

Another limitation of the sample is that the studies primarily investigated the immediate or temporary effects of music listening on empathy. Colverson et al. (2021) and McDonald et al. (2022) were non-longitudinal experiments that tested the immediate effects of music listening on empathic decision-making and empathic emotions. Cuervo & Campayo (2024), Kiarostami (2022), and Mellizo (2019) conducted the music sessions over a longitudinal period but only administered one pretest and posttest, which tested participants' empathy levels. Dos Santos (2018) evaluated the participants' empathy development throughout the sessions via video recordings. In addition to a pretest and posttest, Huang & Gu (2024) tested for empathy and related behavior during the sessions and outside of class. Nonetheless, even if some of these studies thoroughly showed heightened levels of empathy and related skills during or immediately after the music interventions, none tested for the long-term effects of music interventions after an extended period without it. Hence, what remains to be explored is whether or not music interventions or music listening increases empathy permanently.

For future research, longitudinal studies should be conducted to test if music interventions have a long-term and persistent effect on empathy levels. It may also be of interest to compare the effectiveness of different durations of music therapy sessions. Further empirical research should be conducted on music listening and empathy levels, as

the former is such an accessible and widespread form of intervention for adolescents. Moreover, identifying the elements of music which exerted the impact on empathy will be helpful, as it is probable that not all music will produce the same effect in adolescence.

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