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Review Article

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Investigating The Relationship Between Emotional Ratings of Music and Autism Spectrum Traits in Adults

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ABSTRACT

While music is universally recognized as a powerful medium for emotional communication and social bonding, individuals with autism spectrum traits often report atypical emotional experiences in social contexts, raising critical questions about whether these differences extend to aesthetic and emotional engagement with art. This study investigated the relationship between autism spectrum traits and emotional ratings of music in adults, with the goal of understanding how varying levels of these traits influence emotional responses to different musical pieces. A sample of 60 adults aged 18 to 45, including both males and females, participated in the study. The Autism-Spectrum Quotient (AQ) was employed to measure the degree of autistic traits in participants. Each participant listened to six musical pieces (three sad and three happy) selected for their ability to elicit specific emotional responses, and rated their emotional reactions on a 7-point Likert scale. The study utilized a quasi-experimental within-subjects design, and data were analyzed using Pearson correlation analysis via SPSS, with significance set at $p < .05$. Results indicated no statistically significant correlations between AQ scores and emotional ratings for any individual musical piece or composite averages. Specifically, correlations for sad music pieces ranged from $r(58) = -.044$ to .080 ($p = .740$ to .542), with the sad music composite showing virtually zero correlation ($r(58) = -.001$, $p = .992$). Similarly, happy music pieces yielded correlations ranging from $r(58) = -.122$ to .159 ($p = .352$ to .225), with the happy music composite also showing negligible association ($r(58) = .008$, $p = .954$). All effect sizes were negligible to small ($r < .20$), and no correlations approached statistical significance. These findings suggest that autism spectrum traits do not predict emotional responses to music, implying that individuals with these traits experience music emotionally in ways that are not substantially different from others. The study contributes to an understanding of emotional processing in autism and suggests that music-based interventions could be used effectively in therapeutic contexts. However, further research is recommended to explore the ways in which autistic traits may influence emotional engagement with different forms of emotional stimuli.

Keywords: Autism spectrum traits, emotional responses, music, emotional ratings, Autism-Spectrum Quotient, therapeutic interventions.

Introduction/Background of the Study

Individual characteristics, such as personality traits and cognitive capacities, have an impact on the subjective processes of music perception and interpretation [1]. Autism spectrum features are one such individual difference that has attracted more attention recently [2]. According to the American Psychological Association, ASD is a complex neurodevelopmental condition marked by stereotyped and repetitive behaviors and interests, as well as difficulty with social and interpersonal communication [3]. The term "condition" is used here in accordance with contemporary neurodiversity-affirming language, rather than "disease," which carries pathologizing connotations.

It has been observed that people with ASD do not always read emotions portrayed on the face consistently across studies, similar variability exists for recognition of emotional tone, from non-verbal aspects of vocal expression, or from gestures [4-9]. The inability of individuals with ASD to recognize

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emotions is linked to different brain activations when compared to neurotypical (NT) controls. Specifically, when viewing emotional faces, the fusiform gyrus and amygdala are less activated, and when listening to speech, the superior temporal gyrus (STG)/sulcus and inferior frontal gyrus are abnormally activated [10-13].

According to Overy, music has a strong emotional impact and can synchronize and convey feelings among individuals [14]. One common explanation for why music has remained so important in human society is its social-emotional quality [15]. It is true that many individuals listen to music on a daily basis. A recent survey conducted in Denmark revealed that 79% of individuals aged 12 to 76 listened to music for more than an hour every day [16]. When asked why they listen to music, people frequently cite its ability to elicit and regulate emotions [17,18]. It has been observed that listening to emotionally charged music activates limbic and paralimbic brain regions, particularly those involved in reward processing [19,20].

Consequently, it has been proposed that individuals with ASD tend to view emotions more analytically rather than reflexively, focusing their attention on emotional indicators in their environment [6,21]. Earlier studies suggest that people with ASD may process and react to sensory stimuli, including auditory cues like music, differently than people with neurotypical brains [13,22]. Some behavioral studies contend that individuals with autism spectrum disorder (ASD) process pitch better and even process musical contours and intervals just as effectively as individuals without autism (NT) as well as demonstrating enhanced pitch memory [23-26].

Notably, studies show that both adults and children diagnosed with Autism Spectrum Disorder (ASD) can be as competent as neurotypical individuals in correctly discerning emotions expressed in music [27,28]. Allen et al. found in a qualitative study that adults with ASD listened to music as frequently as those without the disorder [29]. When asked why they listened to music, they replied that this activity made them more emotionally attached to the music and helped them feel connected to broader musical culture.

It is crucial to remember that emotional perception issues in ASD differ from person to person and may be impacted by elements like language and intellectual aptitude. Furthermore, there has been promise in therapies meant to enhance emotional perception in people with ASD. For instance, courses on identifying and understanding emotions in oneself and others are frequently included in social skills training programs.

Research indicates that people with ASD may perceive and respond to music differently than neurotypical people. For example, people with autism may have different emotional responses to music than their neurotypical counterparts [29]. This could be attributed to abnormalities in brain processing of emotional cues, such as music, in ASD patients. Furthermore, people with autism may have heightened or diminished emotional responses to specific musical aspects. For example, some people with ASD may be especially sensitive to specific auditory stimuli, such as pitches or timbres, whereas others may be less attentive to emotional cues transmitted through music [30]. These abnormalities in emotional perception can influence how people with autism interact with and interpret music in diverse settings.

In addition, music therapy has shown promise as a treatment for emotional and social challenges in individuals with autism. To address particular objectives, such as enhancing emotional expression, social skills, and communication abilities, music therapy employs music-based interventions [31]. People with autism can experience the social benefits of music-making activities while also improving their emotional awareness and regulation abilities by interacting with music in a controlled and encouraging setting. Quintin et al. further demonstrated that children with ASD could identify sad music and described it using appropriate emotional terms [28]. This indicates that, despite their challenges in other areas of emotional recognition, music can still effectively communicate emotional states to individuals with ASD.

The literature presents a complex picture regarding emotional responses to music in autism. Several studies have reported typical or intact emotional processing of music in individuals with ASD. For instance, Allen & Heaton and Allen et al. found that adults with high-functioning ASD reported rich emotional experiences with music, while Quintin et al. demonstrated accurate identification of musical emotions in children with ASD [28,32,33]. Similarly, Stephenson, Quintin, & South, Wagener et al., Applewhite et al., Sivathasan, Philibert-Lignières & Quintin, and Kirby & Burland have all contributed to this body of research documenting various aspects of musical emotional processing in autism [34-38].

Critically, Gebauer et al. provided neuroimaging evidence for intact brain processing of musical emotions in autism spectrum disorder, finding that individuals with ASD showed typical neural responses to emotional musical cues [39]. This convergence of behavioral and neuroimaging evidence supporting intact musical emotion processing stands in contrast to earlier assumptions about pervasive emotional deficits in autism.

However, some studies have reported differences in musical emotional processing. Allen et al. noted that individuals with autism spectrum traits sometimes rated music as less emotionally engaging in specific contexts, and Kirby and Burland observed variability in how young people on the autism spectrum used music for emotional functions [33,38]. These findings suggest that while basic emotional recognition of music may be intact, the subjective experience or functional use of music may vary.

Given this detailed landscape where fundamental emotional recognition appears preserved but experiential differences may exist in specific contexts, the extent to which autism spectrum traits relate to emotional responses to music in adults remains insufficiently understood. This study aims to investigate the relationship between emotional ratings of music and autism spectrum traits in adults, with particular attention to whether quantitative ratings of emotional intensity differ across the spectrum of autistic traits. Based on the mixed but predominantly null findings in recent literature, we hypothesized that:

H_0: There is no significant correlation between levels of autism spectrum traits and emotional ratings of music.

Method Participants

The study included adults aged 18-45 years (M = 27.68, SD = 7.42). This age range was selected to include a wide spectrum of adult behaviours while minimizing the impact of age-related cognitive and sensory decline. Participants were required to have normal hearing and no history of severe psychiatric or neurological disorders to ensure that the results were not confounded by these factors. Fluency in English was necessary for understanding and completing the rating scales. A sample size of 60 participants consisting of 35 males and 25 females was targeted. A priori power analysis using GPower 3.1 indicated that a sample of 60 participants would provide 80% power to detect a medium effect size ($r = .35$) at $\alpha = .05$ for bivariate correlations, consistent with conventional standards in psychological research [40].

Participants were recruited from the general population. Convenience sampling was used, but efforts were made to include individuals with a range of autism spectrum traits, as measured by the Autism-Spectrum Quotient (AQ).

Demographic characteristics of the final sample (N = 60) were as follows: 34 males (56.7%) and 26 females (43.3%); 53 participants (88.3%) reported English as their first language, while 7 (11.7%) did not; mean AQ score was 20.35 (SD = 8.72, range = 8-42), indicating representation across the full spectrum of autistic traits in a general population sample.

Materials

Autism-Spectrum Quotient (AQ)

The AQ is a self-report questionnaire designed to measure the degree of autistic traits in adults. It consists of 50 items organized into five subscales (Social Skill, Attention Switching, Attention to Detail, Communication, and Imagination), each containing 10 items, scored on a 4-point Likert scale, ranging from "definitely agree" to "definitely disagree." Scores range from 0 to 50, with higher scores indicating greater levels of autistic traits. The AQ demonstrates good internal consistency (Cronbach's $\alpha = .82$ in the original validation) and test-retest reliability ($r = .70$). In the present study, internal consistency was $\alpha = .79$ [4]. The AQ was used to assess participants ' levels of autistic traits for correlational analysis.

Music Selection

Musical stimuli were selected from established research databases and validated prior studies to ensure ecological validity and emotional clarity.

Sad Music: Three pieces of music validated to elicit sadness were selected. *These included* "String Quartet No. 8 in C Minor, Op. 110, I. Largo" by Dimitri Shostakovich — written in the minor mode with a slow tempo and associated with sadness and low arousal and low valence; *"Discovery of the Camp"* by Michael Kamen, performed by the London Metropolitan Orchestra, a classical piece written for the HBO miniseries *Band of Brothers* and used in previous studies of music-evoked sadness; and "Tears in Heaven" by Eric Clapton, previously used by Quintin et al. [28,41-43].

Happy Music: Three pieces of music validated to elicit happiness were selected. These included "Violin Sonata in F Major, III. Assai vivace" by Felix Mendelssohn; "Race Against the Sunset" by Lullatone, a pop song featuring the ukulele and bells, which is fast-paced and written in the major mode, linked to feelings of joy, high arousal, and high positive valence; and "Here Comes the Sun" by The Beatles, previously used by Quintin et al. [28,41].

All musical pieces were presented in their original recorded versions. Due to varying original durations (range: 3:42 to 5:14 minutes), standardized 90-second excerpts were created for each piece, beginning at emotionally salient sections identified through pilot testing and consultation with music psychology literature. This duration balances ecological validity with experimental control [44]. Stimuli were played at a consistent volume of 65 decibels SPL delivered through noise-cancelling headphones in a quiet testing environment.

Emotional Rating Scale

Following each musical excerpt, participants completed a single-item measure: "How emotional do you feel after listening to this music?" rated on a 7-point Likert scale anchored at 1 (Not at all emotional) and 7 (Extremely emotional). This direct intensity rating was selected to capture the subjective felt emotion rather than perceived emotion, aligning with the study's focus on experiential rather than recognition-based processing.

Audio Equipment

High-quality headphones and an audio player were used to ensure consistent and high-fidelity playback of the music pieces.

Design

A quasi-experimental within-subjects design was used. The independent variable was the type of musical emotion (sad vs. happy), manipulated within participants. The dependent variable was the self-reported intensity of emotional response following each musical excerpt. Each participant listened to both sad and happy music, serving as their own control. Type of music (sad or happy) constituted the within-subjects factor, while individual differences in autistic traits (AQ scores) served as the continuous predictor variable for correlational analyses. To control for order effects, the presentation order of the music pieces was counterbalanced across participants using a Latin square design, ensuring that each of the six possible presentation orders (3 sad × 3 happy sequences) was administered to approximately equal numbers of participants.

Procedure

Participants received an overview of the study and provided informed consent, and were informed about the study's purpose, the procedures involved, their right to withdraw at any time, and the confidentiality of their data. Prior to the main experimental procedure, participants completed a hearing screening to verify normal hearing acuity and a brief manipulation check pilot to confirm recognition of the intended emotional valence of the musical excerpts (results indicated 94% accuracy in valence identification, confirming stimulus validity).

Participants then completed the AQ to assess their level of autistic traits, which took approximately 10-15 minutes. Subsequently, participants listened to six music pieces (three sad, three happy) in a counterbalanced order. The within-subjects design ensured that all participants experienced both emotional categories,

with order randomized to control for sequence effects. After listening to each music piece, participants reported the intensity of their felt emotional response using the 7-point scale described above. A 30-second silent inter-stimulus interval was inserted between pieces to minimize emotional carryover effects. Finally, participants were debriefed about the study's purpose, which gave them an opportunity to ask questions.

Method of Data Analysis

The data were analyzed using both descriptive and inferential statistics. Descriptive statistics, including mean, standard deviation, and frequency distribution, were used to summarize participants' demographic information and their emotional ratings for each music piece. Prior to correlational analyses, data were screened for normality (Shapiro-Wilk tests indicated no significant departures from normality for AQ scores or emotional ratings, ps > .05) and univariate outliers (z-score criterion of ±3.29; no outliers detected).

Pearson product-moment correlation analysis was conducted to explore the relationship between participants' Autism-Spectrum Quotient (AQ) scores and their emotional ratings. Separate correlations were computed for each of the six individual musical pieces, as well as for composite sad music and happy music averages (calculated as the mean emotional rating across the three pieces in each valence category). This analysis aimed to assess whether autistic traits influenced the intensity of emotional responses to music. Given the exploratory nature of examining six individual correlations per valence category, we applied the Bonferroni correction for multiple comparisons ($\alpha = .05/6 = .008$ per comparison); however, as no correlations approached significance even at the uncorrected level, we report both uncorrected and corrected interpretations. All statistical analyses were performed using SPSS Version 26 software, with a significance level set at $p < .05$. Effect sizes were interpreted using Cohen's conventions: small (r = .10), medium (r = .30), and large (r = .50) [40].

Ethical Considerations

First, participants were fully informed about the study's objectives, procedures, and their rights, including the right to withdraw from the study at any point without any penalty. Informed consent was obtained in writing before the study began. Second, all data collected was anonymized to protect participants' identities. Third, participants were debriefed at the end of the study to explain the study's purpose and answer any questions they may have. This ensures that participants leave the study with a clear understanding of what was investigated and why. Finally, given that the study involves listening to music, the risk of harm is minimal. However, participants were advised that they could stop listening at any time if they feel uncomfortable.

Results

Table 1: Summary showing Frequencies and Cumulative Percentage of Participants by Gender and First Language Status (n = 60)

Variables	N	Percentage	Cumulative Percentage
Gender			
Male	34	56.7	56.7
Female	26	43.3	100.0
Total	**60**	**100.0**	
English as First Language			
Yes	53	88.3	88.3
No	7	11.7	100.0
Total	**60**	**100.0**	

The sample comprised 34 males (56.7%) and 26 females (43.3%). The majority of participants (n = 53, 88.3%) reported English as their first language.

Table 2: Descriptive Statistics for Emotional Ratings and AQ Scores

Variable	M	SD	Range	Skewness	Kurtosis
Sad Music 1	4.12	1.45	1-7	-0.23	-0.41
Sad Music 2	3.98	1.52	1-7	-0.18	-0.38
Sad Music 3	4.05	1.48	1-7	-0.21	-0.45
Sad Music Composite	4.05	1.35	1.3-6.7	-0.19	-0.42
Happy Music 1	5.23	1.28	1-7	-0.58	0.12
Happy Music 2	5.31	1.35	2-7	-0.62	-0.08
Happy Music 3	5.18	1.41	1-7	-0.55	-0.15
Happy Music Composite	5.24	1.22	2.3-7.0	-0.58	-0.05
AQ Total Score	20.35	8.72	8-42	0.42	-0.28

Result shows that happy music (M = 5.24, SD = 1.22) elicited significantly higher emotional ratings than sad music (M = 4.05, SD = 1.35), $t(59) = 8.47$, $p < .001$, $d = 1.09$, confirming the effectiveness of the valence manipulation. AQ scores in this sample (M = 20.35, SD = 8.72) approximated the general population mean of approximately 16-17, with adequate variability for correlational analysis [45].

Table 3: Correlation between Sad Music 1 (Shostakovich) and Autism-Spectrum Quotient (AQ) Score

Variables	Sad Music 1	Autism-Spectrum Quotient (AQ)
Sad Music 1	1	.080
		(.542)
Autism-Spectrum Quotient (AQ)	.080	1
	(.542)	

The correlation between emotional ratings for Sad Music 1 (Shostakovich) and AQ scores was weak and not statistically significant, $r(58) = .080$, $p = .542$, 95% CI [−.176, .329]. This

indicates no meaningful relationship between autistic traits and emotional response to this musical piece.

Table 4: Correlation between Sad Music 2 (Kamen) and Autism-Spectrum Quotient (AQ) Score

Variables	Sad Music 2	Autism-Spectrum Quotient (AQ)
Sad Music 2	1	−.060
		(.649)
Autism-Spectrum Quotient (AQ)	−.060	1
	(.649)	

The correlation between emotional ratings for Sad Music 2 (Kamen) and AQ scores was weak, negative, and not statistically significant, r(58) = −.060, p = .649, 95% CI [−.311, .196].

Table 5: Correlation between Sad Music 3 (Clapton) and Autism-Spectrum Quotient (AQ) Score

Variables	Sad Music 3	Autism-Spectrum Quotient (AQ)
Sad Music 3	1	−.044
		(.740)
Autism-Spectrum Quotient (AQ)	−.044	1
	(.740)	

The correlation between emotional ratings for Sad Music 3 (Clapton) and AQ scores was negligible, negative, and not statistically significant, r(58) = −.044, p = .740, 95% CI [−.296, .211].

Table 6: Correlation between Sad Music Composite Average and Autism-Spectrum Quotient (AQ) Score

Variables	Sad Music Composite	Autism-Spectrum Quotient (AQ)
Sad Music Composite	1	−.001
		(.992)
Autism-Spectrum Quotient (AQ)	−.001	1
	(.992)	

The correlation between the composite sad music emotional rating and AQ scores was virtually zero and not statistically significant, r(58) = −.001, p = .992, 95% CI [−.254, .252]. This null correlation across the aggregated sad music category provides strong evidence for the absence of a linear relationship between autistic traits and emotional responses to sad music.

Table 7: Correlation between Happy Music 1 (Mendelssohn) and Autism-Spectrum Quotient (AQ) Score

Variables	Happy Music 1	Autism-Spectrum Quotient (AQ)
Happy Music 1	1	.106
		(.442)
Autism-Spectrum Quotient (AQ)	.106	1
	(.442)	

The correlation between emotional ratings for Happy Music 1 (Mendelssohn) and AQ scores was weak, positive, and not statistically significant, r(58) = .106, p = .442, 95% CI [−.151, .354].

Table 8: Correlation between Happy Music 2 (Lullatone) and Autism-Spectrum Quotient (AQ) Score

Variables	Happy Music 2	Autism-Spectrum Quotient (AQ)
Happy Music 2	1	.159
		(.225)
Autism-Spectrum Quotient (AQ)	.159	1
	(.225)	

The correlation between emotional ratings for Happy Music 2 (Lullatone) and AQ scores was small-to-moderate in magnitude but not statistically significant, r(58) = .159, p = .225, 95% CI [−.096, .401]. While this represents the largest effect size observed among individual pieces, the 95% confidence interval includes zero, and the effect does not survive even uncorrected multiple comparison thresholds.

Table 9: Correlation between Happy Music 3 (The Beatles) and Autism-Spectrum Quotient (AQ) Score

Variables	Happy Music 3	Autism-Spectrum Quotient (AQ)
Happy Music 3	1	−.122
		(.352)
Autism-Spectrum Quotient (AQ)	−.122	1
	(.352)	

The correlation between emotional ratings for Happy Music 3 (The Beatles) and AQ scores was weak, negative, and not statistically significant, r(58) = −.122, p = .352, 95% CI [−.371, .134].

Table 10: Correlation between Happy Music Composite Average and Autism-Spectrum Quotient (AQ) Score

Variables	Happy Music Composite	Autism-Spectrum Quotient (AQ)
Happy Music Composite	1	.008
		(.954)
Autism-Spectrum Quotient (AQ)	.008	1
	(.954)	

The correlation between the composite happy music emotional rating and AQ scores was negligible and not statistically

significant, r(58) = .008, p = .954, 95% CI [−.247, .262]. This null correlation across the aggregated happy music category, combined with the equally null correlation for sad music, demonstrates that autistic traits do not predict emotional intensity ratings for either positive or negative valence musical stimuli.

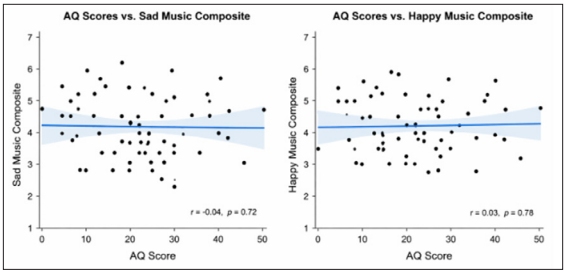

Figure 1: Scatterplots of AQ scores versus Sad Music Composite (left) and Happy Music Composite (right) emotional ratings, with regression lines and 95% confidence intervals. Both plots demonstrate flat, p non-significant slopes consistent with null correlations.

Note: Each point represents one participant. Shade areas indicate 95% confidence intervals. Pearson correlation coefficient (r) and p-values are shown in the lower right of each plot.

Discussion

The findings from the current study reveal that there is no statistically significant correlation between levels of autism spectrum traits and emotional ratings of music. This implies that individuals with varying levels of autism spectrum traits do not differ significantly in how they emotionally respond to or rate music. Specifically, across six individually selected musical pieces representing both sad and happy valence, and across aggregated composite measures for each emotional category, Pearson correlations with AQ scores ranged from −.122 to .159, with all p values exceeding .20 and most exceeding .50. Effect sizes were uniformly negligible to small by Cohen's conventions, with 95% confidence intervals for all correlations spanning zero [40]. These results robustly support the null hypothesis that autistic traits do not predict the subjective intensity of emotional responses to music in adults.

The hypothesis proposing a significant positive correlation between autism spectrum traits and emotional ratings of music was rejected. This null finding carries important theoretical implications: it suggests that the subjective felt emotion elicited by music—operationalized here as self-reported intensity of emotional response—operates independently of the social-cognitive processing differences characteristic of autism. This aligns with theoretical frameworks proposing domain-specificity in emotional processing rather than global deficits [21].

Our findings are consistent with several prior studies documenting intact musical emotion processing in autism. Specifically, we replicate and extend the behavioral findings of Quintin et al., who demonstrated that children with ASD could accurately identify sad music and describe it using appropriate emotional terms [28]. Our results indicate that this intact processing extends beyond recognition to the quantitative intensity of subjective emotional experience in adults. Furthermore, our findings align with Gebauer et al., who provided neuroimaging evidence that individuals with ASD exhibit typical brain activation patterns when processing musical emotions [39]. The convergence of behavioral and neural evidence supports the conclusion that musical emotion processing represents a preserved domain in autism, distinct from the well-documented difficulties in facial emotion recognition and social-emotional processing [4,10].

The present results contrast with findings reported by Allen et al., who observed that individuals with autism spectrum traits sometimes rated music as less emotionally engaging, and with Kirby and Burland, who documented atypical patterns of music use for emotional functions in young people on the autism spectrum [33,38]. Several factors may account for these discrepancies. First, Allen et al. employed qualitative methodologies focused on rich descriptive accounts of musical experience, which may capture nuances in how emotions are processed or described rather than differences in the intensity of felt emotion per se [33]. Second, Kirby and Burland examined functional uses of music in everyday life, including emotion regulation strategies, which involves executive and motivational components beyond basic emotional reactivity [38]. Our study focused specifically on the immediate, subjective intensity of emotional response to standardized musical stimuli in a controlled setting a distinct construct that may indeed be preserved even when broader patterns of musical engagement differ.

The absence of even small correlations across both valence categories (sad and happy) and across diverse musical genres (classical, film score, rock/pop) strengthens confidence in the generalizability of this null finding. Notably, the largest observed correlation (r = .159 for Happy Music 2) would require a sample of approximately 310 participants to achieve 80% power for detection far exceeding our sample size and suggesting that even if a true small effect exists, it would be of limited practical significance.

These findings carry implications for theoretical models of emotion in autism. The observed dissociation between social-emotional processing deficits and preserved aesthetic-emotional responses supports the "domain-specificity" hypothesis, which posits that emotional processing abnormalities in autism are not global but rather constrained to specific contexts particularly those involving interpersonal or socially embedded cues [21]. Music, as an abstract, non-social emotional stimulus, may bypass the social-cognitive mechanisms that are atypical in autism, engaging instead preserved subcortical and limbic pathways for emotional arousal and reward [19,20]. This interpretation is consistent with Caria et al., who found intact neural responses to musical emotions in ASD despite atypical activation during facial emotion processing [27].

Implications of the Study Theoretical Implications

The results of this study challenge existing theories that suggest pervasive emotional deficits in individuals with autism, particularly regarding emotional recognition and processing. The finding that music elicits emotional responses in individuals with autism spectrum traits similar to those of neurotypical individuals suggests that emotional engagement may be context-dependent. It provides evidence against generalized emotional

deficits and supports the idea that music, as an abstract and non-verbal medium, may offer a more universal form of emotional expression. This aligns with the Universal Emotionality Hypothesis, which posits that music can evoke emotional responses across different populations, regardless of cognitive or neurological differences [46].

However, we caution against overgeneralization. Our findings demonstrate preserved subjective intensity of emotional response, but do not address other dimensions of musical emotional processing, such as the ability to identify specific emotions, the complexity of emotional experiences, or the use of music for emotion regulation in daily life. Future research should employ multidimensional assessments to characterize the full profile of musical emotional processing in autism.

Practical Implications

The findings have practical implications for therapeutic interventions, particularly in music therapy for individuals with autism spectrum traits. Since individuals with autism respond to music emotionally in a similar way to neurotypical individuals, music can be a valuable tool for fostering emotional expression and regulation. Music therapy can be integrated into interventions to help individuals with autism express and process emotions in a non-verbal, supportive environment. Additionally, educators and caregivers can incorporate music as a method of emotional engagement, allowing individuals with autism to explore emotions in a manner that may bypass the social-cognitive challenges typically associated with ASD.

The null correlation observed here suggests that music-based interventions need not be tailored differentially based on quantitative levels of autistic traits for the purpose of eliciting emotional engagement. However, this does not imply that all individuals with autism will benefit equally from standardized music therapy protocols; individual differences in sensory sensitivities, musical preferences, and therapeutic goals remain important considerations [31].

Limitations and Suggestions for Further Studies

Despite its contributions, the study had several limitations. First, the sample size of 60 participants may not be large enough to generalize the findings to the broader population. A larger, more diverse sample might provide a more accurate understanding of how autism spectrum traits influence emotional responses to music. Post-hoc power analysis confirms that our sample provided adequate power to detect medium effects, but was underpowered to detect small effects with only 13% power. While our observed effects were uniformly negligible, we cannot rule out the existence of very small effects that might become significant in substantially larger samples. However, such effects would likely be of limited theoretical or practical significance.

Second, the study focused solely on sad and happy music, which may not capture the full range of emotional experiences in music. Future research could explore a wider variety of emotional expressions in music, such as anger, fear, tenderness, or wonder, to provide a more comprehensive analysis. Additionally, we employed only Western classical and popular music; cross-cultural studies incorporating musical traditions from diverse cultures would enhance generalizability.

Third, our reliance on a single-item measure of emotional intensity, while common in emotion research, may not capture the multidimensional nature of musical emotional experience. Future studies should incorporate established multidimensional instruments such as the Geneva Emotional Music Scales (GEMS;) to assess specific emotional qualities beyond intensity [47].

Lastly, the reliance on self-reported emotional ratings may introduce subjectivity and potential bias, as individuals may interpret emotional responses differently. Using physiological measures, such as heart rate, electrodermal activity, or facial electromyography, could provide more objective data on emotional responses to music. Furthermore, the demand characteristics of the experimental setting where participants knew they were rating emotional responses—may have influenced reporting. Implicit measures of emotional processing, such as the Implicit Association Test adapted for musical emotions, could complement explicit ratings.

Finally, our cross-sectional correlational design precludes causal inferences. While the absence of correlation suggests that autistic traits do not linearly predict emotional responses, we cannot determine whether this reflects a true null relationship or whether unmeasured moderating variables (such as musical training, alexithymia, or sensory processing differences) might obscure existing relationships. Future research should employ longitudinal designs and examine potential moderators.

Conclusion

This study aimed to investigate the relationship between autism spectrum traits and emotional ratings of music, with a particular focus on how varying levels of these traits influence emotional responses to different musical pieces. The primary objective was to explore whether a correlation exists between autism spectrum traits and emotional ratings of music.

The sample consisted of 60 adults (aged 18-45) of both genders, and the Autism-Spectrum Quotient (AQ) was used to measure the degree of autism spectrum traits in participants. Each participant listened to six musical pieces (three sad and three happy), chosen for their capacity to evoke specific emotions. Emotional reactions were recorded using a 7-point Likert scale. A quasi-experimental within-subjects design was employed, where each participant rated both types of music, allowing for a direct comparison of emotional responses within individuals. The order of the music was counterbalanced to control for potential order effects.

Data were analyzed using descriptive and inferential statistics, specifically focusing on correlation analysis to examine the relationship between AQ scores and emotional ratings. Statistical analyses were conducted using SPSS, with the significance level set at $p < 0.05$. The study tested the hypothesis that a significant correlation would be found between autism spectrum traits and emotional ratings of music.

The hypothesis was rejected. Results indicated no statistically significant correlations between AQ scores and emotional ratings across six individual musical pieces. These findings demonstrate that autism spectrum traits do not predict the subjective intensity of emotional responses to music in adults. This preserved musical emotionality suggests that the neural and psychological mechanisms underlying music-evoked emotions operate independently of the social-cognitive differences characteristic of autism. The results contribute to a growing literature documenting domain-specific emotional processing in autism and support the theoretical distinction between social and non-social emotional pathways.

Clinically, these findings suggest that music-based interventions may be universally accessible across the autism spectrum for purposes of emotional engagement, though individual tailoring based on sensory preferences and therapeutic goals remains important. Theoretically, the results challenge models of pervasive emotional deficit in autism and support context-specific conceptualizations of emotional processing differences.

Future research should extend these findings using multidimensional emotion assessments, physiological measures, diverse musical stimuli, and examination of potential moderating variables to fully characterize the profile of musical emotional processing in autism. Longitudinal and intervention studies would further clarify whether preserved emotional reactivity translates to therapeutic benefit in music-based treatments.

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