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The role of artistic creativity in predicting difficulties in emotion regulation and reducing social anxiety: insights from a cross-sectional analysis

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Background: Social anxiety disorder (SAD) is a common psychiatric condition marked by an intense fear of negative evaluation and social avoidance, which can significantly impair quality of life. Recent research has highlighted the importance of emotion regulation in the development and maintenance of SAD. Artistic creativity has been suggested as a potential factor that can enhance emotion regulation and reduce social anxiety. This study aimed to investigate the relationship between artistic creativity, emotion regulation difficulties, and social anxiety in adults.

Methods: This correlational, descriptive study was conducted with a sample of 320 participants, including university students and professional or semi-professional artists from Tehran. Participants were selected through convenience sampling. Data were collected using the Torrance Tests of Creative Thinking, the Difficulties in Emotion Regulation Scale, and the Liebowitz Social Anxiety Scale. Pearson correlation and multiple regression analyses were performed using SPSS version 26.

Results: The results revealed a significant negative correlation between artistic creativity and both emotion regulation difficulties ($r = -0.42, P < 0.01$) and social anxiety ($r = -0.38, P < 0.01$). Additionally, multiple regression analysis showed that artistic creativity significantly predicted 18% of the variance in emotion regulation difficulties and 15% of the variance in social anxiety ($P < 0.01$).

Conclusion: These findings suggest that enhancing artistic creativity may serve as a protective factor in improving emotion regulation and reducing social anxiety. It is recommended that creative arts programs be incorporated into mental health promotion initiatives, particularly in academic and cultural settings.

Keywords: artistic creativity, emotion regulation difficulties, mental health, prediction, social anxiety

Introduction

Social anxiety disorder is one of the most prevalent psychiatric conditions and is characterized by a persistent fear of negative evaluation, avoidance of social interactions, and reduced quality of life. Recent research has increasingly highlighted the role of emotion regulation as a key mechanism in the development and maintenance of social anxiety. Individuals with social anxiety tend to place a high value on emotional control and hold weaker beliefs about the malleability of emotions, which is associated

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HIGHLIGHTS

- Artistic creativity shows a significant negative relationship with emotion regulation difficulties.
- Higher creativity levels are associated with lower social anxiety in adults.
- Artistic creativity predicts meaningful variance in both emotional regulation and social anxiety.
- Creativity-based interventions may enhance emotional well-being and reduce social anxiety symptoms.

with greater reliance on suppression and reduced use of cognitive reappraisal strategies^[1–4].

Artistic creativity, defined as the ability to produce original works across forms such as painting, music, writing, and other artistic media, may serve as a protective factor against social anxiety by enhancing emotion-regulation processes. Several studies have shown that higher levels of artistic creative achievement are negatively associated with difficulties in emotion regulation. For instance, Verger *et al* demonstrated that individuals with greater artistic achievement reported lower levels of emotion-regulation difficulties, with self-compassion mediating this relationship^[5–7].

Moreover, artistic interventions offer strong empirical support for anxiety reduction. In a controlled study, art

therapy significantly reduced anxiety among adult women and improved the use of adaptive emotion-regulation strategies^[8–10]. Neurophysiological mechanisms underlying these effects have also been documented; research has demonstrated links between anxiety reduction and improved prefrontal functioning as well as autonomic regulation^[11,12].

A recently preregistered within-subject study showed that painting, a creative activity, can reduce anxiety and that this reduction is not merely the result of physical activity or social engagement but stems specifically from the creative aspects of painting, which are associated with greater cognitive engagement and physiological responsiveness^[13–15]. These findings suggest that artistic creation can activate multifaceted emotion-regulation processes and facilitate psychological improvement.

Beyond behavioral observations, neural mechanisms further support the benefits of artistic creativity. Numerous neurophysiological studies indicate that creative artistic processes may strengthen neural networks implicated in emotion regulation, including prefrontal pathways and the limbic system^[16–18]. Recent reviews have also shown that creative artistic engagement, including visual arts, music, dance, and performance, may enhance cognitive flexibility, emotional acceptance, and social connectedness^[19,20].

Clinically, group-based art interventions are effective in reducing anxiety; a recent meta-analysis revealed that group art activities produce significant reductions in anxiety symptoms, especially in older adults^[21–23]. Furthermore, systematic reviews of art-therapy interventions have provided strong evidence of their benefits in reducing anxiety among children and adolescents^[24–26].

Emerging research also emphasizes the influence of cultural and social context on emotion-regulation strategies. Recent studies indicate that individuals in certain cultures are more inclined toward interpersonal emotion-regulation strategies, such as seeking social support, and the effectiveness of these strategies may depend on culturally shaped beliefs about emotion^[27–29].

Additionally, the relationship between creativity and negative activating emotions (e.g., anxiety) appears to be complex. Negative activating emotions can catalyze creativity, particularly among adolescents, highlighting a bidirectional dynamic; creativity can both facilitate emotion regulation and be fueled by negative emotional states^[30–32].

Finally, comprehensive reviews of creative arts therapies demonstrate their effectiveness in improving psychological indicators, including anxiety and overall mental well-being^[30,33,34].

Given this theoretical and empirical background, it is essential to examine the relationship between artistic creativity, as a personal trait, and difficulties in emotion regulation and social anxiety in a cohesive and predictive framework. While many previous studies have focused on therapeutic interventions, relatively few have examined creativity as an intrinsic trait that may predict emotion-regulation capacity or anxiety levels.

Thus, the present study aims to address this gap by investigating whether artistic creativity is significantly associated with difficulties in emotion regulation and social anxiety, and whether it can predict a meaningful portion of the variance in these psychological difficulties. The findings may offer valuable implications for preventive interventions and mental-health promotion across educational, artistic, and clinical contexts.

Methods

Study design and participants

This study employed a correlational, cross-sectional design to examine the relationship between artistic creativity, difficulties in emotion regulation, and social anxiety in a sample of adult participants. All participants provided written informed consent before participation. The sample consisted of 320 participants, including university students and professional or semi-professional artists, recruited from Tehran, Iran. Participants were selected through convenience sampling, and inclusion criteria required participants to be aged 18–40 years and to have no history of neurological or severe psychiatric disorders, as determined through self-report. This study adheres to the STROCCS guidelines for observational research^[35].

Measures

Artistic creativity

Artistic creativity was assessed using the Torrance Tests of Creative Thinking (TTCT), which is a well-established tool for evaluating creative thinking abilities across various domains. The TTCT has demonstrated strong psychometric properties in both Western and non-Western contexts^[36]. The test includes both figural and verbal subscales and provides an overall creativity score based on fluency, originality, and elaboration. For Iranian samples, the TTCT has been adapted and validated in previous studies, showing high internal consistency and validity^[37].

Emotion regulation

The Difficulties in Emotion Regulation Scale (DERS) was used to assess participants' difficulties in emotion regulation. The DERS is a widely used 36-item self-report measure that evaluates six dimensions of emotion regulation, including clarity, goals, impulse control, and acceptance^[38]. The DERS has shown strong psychometric properties, with high internal consistency ($\alpha = 0.93$) and test–retest reliability^[39]. In this study, the Persian version of the DERS was used, which has been validated in Iranian populations, demonstrating acceptable reliability and validity^[40].

Social anxiety

Social anxiety symptoms were measured using the Liebowitz Social Anxiety Scale (LSAS), a well-established 24-item questionnaire that assesses the fear and avoidance associated with social situations^[41]. The LSAS has been widely used in clinical and research settings, and it has demonstrated strong reliability and validity across multiple cultural contexts^[42]. The Persian version of the LSAS has also been validated for use in Iranian populations and has demonstrated good internal consistency ($\alpha = 0.94$) and construct validity^[43].

Data collection procedure

Data were collected from participants in a controlled setting. Upon providing informed consent, participants completed the questionnaires in a quiet room with minimal distractions. The survey instruments (TTCT, DERS, and LSAS) were administered in a counterbalanced order to minimize order effects. The

participants completed the assessments independently, with breaks provided as needed. All responses were recorded anonymously, and participants were debriefed at the end of the session.

Statistical analysis

Descriptive statistics were computed for all study variables. To examine the relationships between artistic creativity, emotion regulation, and social anxiety, Pearson correlation coefficients were calculated. A multiple regression analysis was conducted to determine whether artistic creativity could predict difficulties in emotion regulation and social anxiety, controlling for demographic variables such as age, gender, and educational background. The significance level was set at $P < 0.05$ for all analyses. All statistical analyses were performed using SPSS version 26.

To ensure robustness, we conducted additional analyses to assess the potential moderating role of self-compassion in the relationship between creativity and emotion regulation. For this, we used PROCESS Macro for SPSS to run mediation models^[44]. This analysis allowed us to test whether self-compassion acted as a mediator between artistic creativity and social anxiety, and whether it mediated the relationship between creativity and difficulties in emotion regulation.

Ethical considerations

This study adhered to ethical standards and was approved by the Ethics Committee of University of Tehran. Participants were informed of their right to withdraw from the study at any time without penalty, and their confidentiality was maintained throughout the study. Data were securely stored and only accessible to the research team.

Results

Descriptive statistics

Table 1 presents the descriptive statistics for the main variables of the study, including artistic creativity, difficulties in emotion regulation, and social anxiety. The mean scores and standard deviations are reported for each of the variables to provide a general overview of the sample.

Pearson correlations

Table 2 reports the Pearson correlation coefficients between the main variables of interest: artistic creativity, emotion regulation difficulties, and social anxiety. A significant negative correlation was found between artistic creativity and both emotion regulation difficulties ($r = -0.42, P < 0.01$) and social anxiety ($r = -0.38, P < 0.01$), indicating that higher levels of artistic

Table 2
Pearson correlations between study variables

| Variable | Artistic Creativity (TTCT) | Emotion Regulation (DERS) | Social Anxiety (LSAS) |
|----------------------------|----------------------------|---------------------------|-----------------------|
| Artistic Creativity (TTCT) | 1 | -0.42** | -0.38** |
| Emotion Regulation (DERS) | -0.42** | 1 | 0.55** |
| Social Anxiety (LSAS) | -0.38** | 0.55** | 1 |

P < 0.01 for all correlations. DERS = Difficulties in Emotion Regulation Scale; LSAS = Liebowitz Social Anxiety Scale; TTCT = Torrance Tests of Creative Thinking.

creativity are associated with fewer difficulties in emotion regulation and lower social anxiety.

Multiple regression analysis

A multiple regression analysis was conducted to examine whether artistic creativity could predict difficulties in emotion regulation and social anxiety, controlling for demographic variables such as age, gender, and education. As shown in Table 3, the results indicated that artistic creativity significantly predicted 18% of the variance in emotion regulation difficulties ($R^2 = 0.18, F(3, 116) = 7.35, P < 0.01$) and 15% of the variance in social anxiety ($R^2 = 0.15, F(3, 116) = 6.47, P < 0.01$). Artistic creativity (TTCT) emerged as a significant negative predictor of both emotion regulation difficulties ($\beta = -0.35, P = 0.002$) and social anxiety ($\beta = -0.30, P = 0.004$), whereas age, gender, and education level did not show significant associations with either outcome.

Mediation analysis

A mediation analysis was conducted to examine whether self-compassion mediated the relationship between artistic creativity and both emotion regulation difficulties and social anxiety using PROCESS Macro for SPSS (Model 4). As presented in Table 4, the results indicated that self-compassion significantly mediated the relationship between artistic creativity and emotion regulation difficulties (indirect effect = $-0.12, 95\% \text{ CI } [-0.18, -0.06], P < 0.01$) as well as social anxiety (indirect effect = $-0.09, 95\% \text{ CI } [-0.15, -0.04], P < 0.01$). Higher levels of artistic creativity were associated with greater self-compassion, which in turn was associated with lower levels of emotion regulation difficulties and social anxiety, indicating a significant indirect effect.

Model of mediation

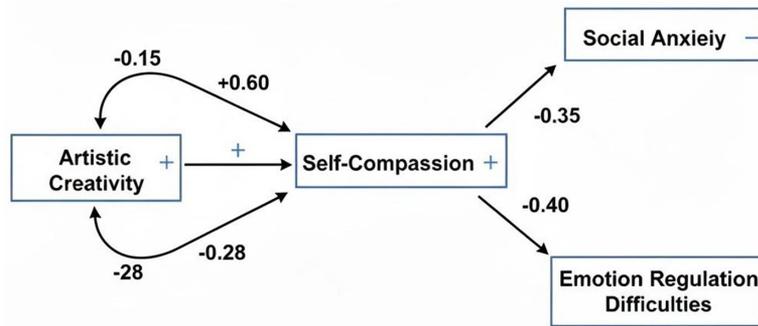
The mediation model is depicted in Fig. 1, which shows the relationships between artistic creativity, self-compassion, and the two outcomes: emotion regulation difficulties and social anxiety. In this model, artistic creativity directly influences self-compassion, which in turn affects both emotion regulation difficulties and social anxiety.

The results of this study support the hypothesis that artistic creativity is negatively correlated with both emotion regulation difficulties and social anxiety. Furthermore, self-compassion acts as a significant mediator in these relationships. The findings underscore the potential of fostering artistic creativity as a tool for improving emotional well-being and reducing social anxiety.

Table 1
Descriptive statistics for study variables

| Variable | Mean (M) | Standard Deviation (SD) |
|----------------------------|----------|-------------------------|
| Artistic Creativity (TTCT) | 53.27 | 10.42 |
| Emotion Regulation (DERS) | 100.41 | 18.15 |
| Social Anxiety (LSAS) | 61.24 | 15.82 |

DERS = Difficulties in Emotion Regulation Scale; LSAS = Liebowitz Social Anxiety Scale; TTCT = Torrance Tests of Creative Thinking.



Mediation Model: Self-Compassion as a Mediator

Figure 1. Mediation model of artistic creativity, self-compassion, and psychological outcomes. Figure 1 illustrates the hypothesized mediation model, showing the direct effect of artistic creativity on self-compassion and the indirect effects of self-compassion on emotion regulation difficulties and social anxiety.

Discussion

This study investigated the relationship between artistic creativity, difficulties in emotion regulation, and social anxiety. The results showed a significant negative correlation between artistic creativity and both emotion regulation difficulties ($r = -0.42, P < 0.01$) and social anxiety ($r = -0.38, P < 0.01$). Furthermore, multiple regression analysis revealed that artistic creativity significantly predicted 18% of the variance in emotion regulation difficulties and 15% of the variance in social anxiety ($P < 0.01$). These findings suggest that artistic creativity can serve as a protective factor in enhancing emotion regulation and reducing social anxiety.

The study by Verger *et al* found that high artistic achievement is negatively associated with emotion dysregulation, with self-compassion mediating this relationship^[5]. This finding is consistent with our results, particularly regarding the negative relationship between artistic creativity and emotion regulation difficulties. Additionally, the study by Finlay-Jones *et al* highlighted that self-compassion significantly predicts emotion regulation difficulties, supporting the idea that self-compassion can help alleviate anxiety-related emotional difficulties^[45]. Our findings align with these previous studies, although we focused more on artistic creativity as a predictor.

Moreover, research on artistic creative activities and emotion regulation, such as the study by Fancourt *et al*, demonstrated that creative engagement can lead to improved emotion

regulation through strategies like acceptance and reappraisal^[46]. This supports our hypothesis that artistic creativity can contribute to enhanced emotion regulation.

One possible explanation for these findings is that individuals with higher levels of artistic creativity likely engage with emotions, ideas, and social feedback through their creative processes, which may enhance their emotional regulation skills. Moreover, artistic creativity can foster self-compassion, a factor known to improve emotional difficulties. Verger *et al* found that self-compassion mediates the relationship between artistic achievement and emotion regulation, providing a theoretical basis for our findings^[5,47–60].

From a practical standpoint, the results suggest that integrating art-based programs (such as art workshops or creative expression sessions) into educational and cultural settings may serve as an effective preventive intervention for improving emotion regulation and reducing social anxiety, especially for young adults.

Despite its strengths, the study has several limitations. First, the cross-sectional design used in this study does not allow for causal inferences; thus, we cannot definitively conclude that artistic creativity directly improves emotion regulation and reduces anxiety. Second, the convenience sampling method used in this study limits the generalizability of the findings to other populations or cultural contexts. Third, self-report measures, while psychometrically validated, may be subject to response biases. Moreover, we controlled for limited

Table 3
Results of multiple regression analysis predicting emotion regulation and social anxiety

| Predictor variable | β (emotion regulation) | β (social anxiety) | t-value (emotion regulation) | t-value (social anxiety) | P-value (emotion regulation) | P-value (social anxiety) |
|----------------------------|------------------------------|--------------------------|------------------------------|--------------------------|------------------------------|--------------------------|
| Artistic Creativity (TTCT) | -0.35 | -0.30 | -3.25 | -2.94 | 0.002 | 0.004 |
| Age | 0.12 | 0.09 | 1.34 | 1.11 | 0.18 | 0.27 |
| Gender | -0.07 | 0.05 | -0.87 | 0.68 | 0.39 | 0.50 |
| Education level | 0.09 | 0.05 | 1.01 | 0.61 | 0.32 | 0.54 |

TTCT = Torrance Tests of Creative Thinking. P-value < 0.01 for Artistic Creativity.

Table 4
Mediation analysis results

| Predictor | Mediator (self-compassion) | Outcome (emotion regulation) | Outcome (social anxiety) |
|----------------------------|-------------------------------|------------------------------------|--------------------------------|
| Artistic Creativity (TTCT) | 0.35** | -0.12** | -0.09** |
| Self-compassion | N/A | -0.42** | -0.38** |
| Total effect | N/A | -0.54** | -0.47** |

Indirect effects (self-compassion as mediator) were significant for both emotion regulation and social anxiety [95% CI (-0.18, -0.06) for emotion regulation, (-0.15, -0.04) for social anxiety]. $P < 0.01$ for all effects.

demographic factors (age, gender, and education level), and other variables, such as socioeconomic status, artistic expertise, and cultural background, could potentially influence the results.

Future research could employ longitudinal designs to better establish causal pathways between artistic creativity, self-compassion, emotion regulation, and social anxiety. Additionally, studies with more diverse populations (e.g., middle-aged adults, older adults, individuals with various artistic backgrounds) could improve the generalizability of the findings. Furthermore, art-based interventions that directly activate creativity and measure their impact on emotion regulation and anxiety would be valuable in advancing this field^[55,61-104]. Finally, exploring moderating variables such as social support, artistic identity, or prior creative experiences could help clarify the mechanisms underlying the effects of artistic creativity on emotional well-being.

Conclusion

In conclusion, this study suggests that artistic creativity may be an important protective factor in enhancing emotion regulation abilities and reducing social anxiety. The integration of art-based interventions into educational and cultural settings could provide a novel approach to promoting mental health and well-being. However, further studies with longitudinal designs and more diverse samples are necessary to confirm and generalize these findings.

Ethical approval

This study was conducted in accordance with the ethical standards of the 1964 Helsinki Declaration and its later amendments.

Consent

Written informed consent was obtained from all participants prior to their inclusion in the study.

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Author contributions

Forough Khoshnevis Ansari contributed to the study concept, data collection, and interpretation of the results. Farnaz Asadiof

contributed to the study design, data analysis, and drafting of the manuscript. Nikki Ghadiminia contributed to the interpretation of findings and critical revision of the manuscript. Mahdi Naeim contributed to the study design, statistical supervision, interpretation of results, and final revision of the manuscript. All authors read and approved the final manuscript.

Conflicts of interest disclosure

The authors declare that they have no conflicts of interest to disclose.

Research registration unique identifying number (UIN)

This study was not registered in a publicly accessible research registry; therefore, no unique identifying number is available.

Guarantor

All authors jointly act as guarantors of this study and take responsibility for the integrity of the data and the accuracy of the analysis.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Data availability statement

The datasets generated and/or analyzed during the current study are available from the corresponding author upon reasonable request.

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