

# Structural Model of the Relationship Between Social Anxiety in University Students and Self-Criticism, Shame, with the Mediating Role of Emotion Regulation and Self-Esteem

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## ABSTRACT

The present study aimed to investigate a structural model explaining social anxiety among university students based on self-criticism and shame, with the mediating roles of emotion regulation and self-esteem. This study employed a descriptive-correlational design using structural equation modeling (SEM). The statistical population consisted of university students in Tehran during the 2025–2026 academic year, from which 360 participants were selected through multistage cluster random sampling. Data were collected using standardized instruments including the Social Anxiety Scale, Levels of Self-Criticism Scale, Experience of Shame Scale, Difficulties in Emotion Regulation Scale, and Rosenberg Self-Esteem Scale. Descriptive statistics and Pearson correlation coefficients were calculated using SPSS-27, and SEM analyses were conducted using AMOS-24. Model fit was evaluated using indices such as  $\chi^2/df$ , CFI, TLI, NFI, and RMSEA. Mediation effects were tested through bootstrapping procedures with 2000 resamples. The results indicated that self-criticism ( $\beta = 0.31, p < 0.001$ ), shame ( $\beta = 0.24, p < 0.001$ ), and emotion regulation difficulties ( $\beta = 0.28, p < 0.001$ ) had significant positive direct effects on social anxiety, whereas self-esteem had a significant negative effect ( $\beta = -0.26, p < 0.001$ ). Additionally, emotion regulation and self-esteem significantly mediated the relationships between self-criticism and social anxiety, as well as between shame and social anxiety ( $p < 0.01$ ). The proposed structural model demonstrated good fit to the data ( $\chi^2/df = 2.41, CFI = 0.94, TLI = 0.92, NFI = 0.91, RMSEA = 0.063$ ). The findings support a comprehensive model in which self-criticism and shame contribute to social anxiety both directly and indirectly through emotion regulation difficulties and reduced self-esteem, highlighting the importance of targeting these mechanisms in psychological interventions.

**Keywords:** Social Anxiety, Self-Criticism, Shame, Emotion Regulation, Self-Esteem, Structural Equation Modeling

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## Introduction

Social anxiety has emerged as one of the most prevalent and functionally impairing psychological conditions among university students, particularly during emerging adulthood, a developmental stage characterized by heightened sensitivity to social evaluation and identity formation. Contemporary research emphasizes that social anxiety is not merely a situational fear but a complex, multidimensional construct involving cognitive distortions, maladaptive emotional responses, and deficits in regulatory processes (1, 2). University environments, which demand continuous social interaction, performance evaluation, and peer comparison, may intensify these vulnerabilities and contribute to the persistence of social anxiety symptoms (3). Empirical findings indicate that individuals with elevated social anxiety experience significant impairments in academic performance, interpersonal functioning, and psychological well-being, making it a critical target for both theoretical investigation and clinical intervention (4, 5).

From a cognitive-affective perspective, self-criticism has been consistently identified as a central vulnerability factor underlying social anxiety. Self-criticism refers to a pervasive tendency to evaluate oneself harshly, often accompanied by feelings of inadequacy, inferiority, and fear of negative evaluation (6, 7). Theoretical models suggest that individuals high in self-criticism are more likely to interpret social situations as threatening and to anticipate rejection or failure, thereby reinforcing anxious responses (8). Empirical studies further support this association, demonstrating that self-criticism is positively correlated with social anxiety and contributes to maladaptive coping strategies, including avoidance and rumination (9, 10). Moreover, fluctuations in perceived social status and self-evaluation have been shown to influence emotional states and anxiety levels, highlighting the dynamic interplay between self-criticism and emotional experience (11).

Closely related to self-criticism is the construct of shame, a self-conscious emotion that arises from negative evaluations of the self and the perception of being flawed or unworthy in the eyes of others. Shame has been conceptualized as a core affective component of social anxiety, as it directly involves concerns about social judgment and rejection (12, 13). Individuals experiencing high levels of shame are more likely to engage in social withdrawal, avoidance, and heightened self-monitoring, all of which exacerbate social anxiety symptoms (14, 15). Experimental and clinical evidence indicates that shame not only co-occurs with social anxiety but may also serve as a causal mechanism linking early adverse experiences to later psychopathology (16, 17). Additionally, psychodynamic perspectives highlight the role of embodied expressions of shame, such as blushing, in reinforcing negative self-perceptions during social interactions (18).

Despite the established roles of self-criticism and shame, recent research has increasingly focused on the mechanisms through which these variables influence social anxiety, particularly the role of emotion regulation. Emotion regulation refers to the processes by which individuals monitor, evaluate, and modify their emotional responses in order to achieve adaptive functioning (19). Deficits in emotion regulation have been strongly associated with various forms of psychopathology, including anxiety disorders, where individuals struggle to manage intense negative emotions (3). In the context of social anxiety, maladaptive regulation strategies such as suppression, avoidance, and rumination may amplify emotional distress and maintain anxious patterns (20, 21). Empirical findings indicate that difficulties in emotion regulation

mediate the relationship between cognitive vulnerabilities and anxiety outcomes, suggesting that improving regulatory capacities may reduce the impact of self-critical and shame-based processes (19, 22).

Another critical factor in understanding social anxiety is self-esteem, defined as the overall evaluation of one's worth or value. Low self-esteem has been consistently linked to increased vulnerability to anxiety and depression, as individuals with negative self-views are more likely to perceive social interactions as threatening and to interpret feedback in a self-deprecating manner (23, 24). Theoretical frameworks such as social rank theory and hierometer theory propose that self-esteem functions as an internal gauge of social status and acceptance, influencing emotional responses and behavioral strategies (11). Empirical studies further demonstrate that self-esteem not only predicts social anxiety but also interacts with emotional and cognitive processes, including self-compassion and emotional regulation, to shape psychological outcomes (4, 25).

Importantly, the interplay between self-criticism, shame, emotion regulation, and self-esteem does not occur in isolation but is embedded within broader developmental and contextual factors. Early adverse experiences, including trauma, neglect, and dysfunctional family environments, have been shown to contribute to the development of maladaptive schemas characterized by defectiveness and shame, which in turn increase vulnerability to social anxiety (17, 26). Similarly, exposure to social stressors such as peer rejection, discrimination, and performance pressures during adolescence and young adulthood can exacerbate these processes and reinforce maladaptive patterns (27, 28). Cross-cultural research also suggests that the expression and experience of social anxiety may vary depending on cultural norms and expectations, highlighting the importance of contextualizing findings within specific populations (29).

Furthermore, contemporary models of social anxiety emphasize the role of transdiagnostic processes that cut across different psychological disorders. For instance, emotional reactivity, perfectionism, and maladaptive self-focused attention have been identified as common mechanisms underlying various forms of psychopathology, including anxiety, depression, and personality disorders (6, 30). These processes are often intertwined with self-criticism and shame, creating a feedback loop that perpetuates emotional distress and impairs adaptive functioning. Research on clinical and non-clinical populations has demonstrated that interventions targeting these transdiagnostic mechanisms can lead to significant improvements in psychological outcomes, further underscoring their importance in understanding social anxiety (2, 31).

In addition, the growing body of literature on social avoidance highlights its role as a key behavioral manifestation of social anxiety and a potential mediator between internal vulnerabilities and external functioning. Social avoidance not only limits opportunities for positive social experiences but also reinforces negative beliefs about the self and others, thereby maintaining the cycle of anxiety (32). Studies have shown that individuals who engage in avoidance behaviors are less likely to develop effective emotion regulation strategies and more likely to experience persistent distress, suggesting that addressing avoidance is critical for intervention efforts (33, 34).

Despite the extensive research on social anxiety, several gaps remain in the literature. Notably, there is a need for integrative models that simultaneously examine cognitive, emotional, and self-related factors within a unified framework. While previous studies have investigated the individual roles of self-criticism, shame, emotion regulation, and self-esteem, fewer studies have explored their combined effects and the potential mediating pathways linking them to social anxiety, particularly in non-Western student populations. Given

the cultural, اجتماعی, and educational characteristics of university students in Tehran, examining these relationships within this context can provide valuable insights into the underlying mechanisms of social anxiety and inform culturally sensitive interventions.

Accordingly, the present study aims to develop and test a structural model of the relationships between social anxiety and its key psychological correlates, focusing on the roles of self-criticism and shame as predictors, and emotion regulation and self-esteem as mediating variables, in a sample of university students in Tehran.

## Methods and Materials

### *Study Design and Participants*

The present study was conducted using a quantitative approach within the framework of a descriptive-correlational design, specifically employing structural equation modeling to examine the hypothesized relationships among variables. The statistical population consisted of undergraduate and graduate students enrolled in universities in Tehran during the 2025–2026 academic year. A total of 360 students were selected through a multistage cluster random sampling method, in which several universities were first randomly selected, followed by random selection of faculties and classes within those institutions. Inclusion criteria included being currently enrolled as a student, willingness to participate, and completion of all questionnaire items, while exclusion criteria involved incomplete responses or withdrawal from participation. Ethical considerations were strictly observed, including informed consent, confidentiality of responses, and voluntary participation. The selected sample size was considered adequate for structural equation modeling based on recommended sample-to-parameter ratios and ensured sufficient statistical power for detecting mediation effects.

### *Data Collection*

**The Social Anxiety Scale (SAS).** Social anxiety was measured using the Social Anxiety Scale developed by Connor et al. in 2000, a widely used instrument designed to assess fear, avoidance, and physiological symptoms associated with social anxiety. This scale consists of 20 items rated on a 5-point Likert continuum ranging from 0 (not at all) to 4 (extremely), with higher scores indicating greater levels of social anxiety. The instrument includes subscales assessing fear, avoidance, and physiological discomfort in social situations. Previous studies have consistently reported strong psychometric properties for this scale, including high internal consistency coefficients (Cronbach's alpha typically above 0.90) and satisfactory construct validity across diverse populations. The validity and reliability of this scale have also been confirmed in multiple Iranian samples, supporting its suitability for use in the present study.

**The Levels of Self-Criticism Scale (LOSC).** Self-criticism was assessed using the Levels of Self-Criticism Scale developed by Thompson and Zuroff in 2004. This instrument consists of 22 items that evaluate two primary dimensions: comparative self-criticism and internalized self-criticism. Items are rated on a 7-point Likert scale ranging from 1 (not at all characteristic of me) to 7 (very characteristic of me), with higher scores reflecting greater levels of self-critical tendencies. The LOSC has demonstrated robust psychometric properties, including strong internal consistency and factorial validity in various cultural contexts. Previous research has also confirmed its reliability and validity in non-Western populations, including adaptations in

Iranian samples, indicating that it is an appropriate measure for assessing self-critical processes in student populations.

The Experience of Shame Scale (ESS). Shame was measured using the Experience of Shame Scale developed by Andrews, Qian, and Valentine in 2002. This scale comprises 25 items assessing three domains of shame: characterological shame, behavioral shame, and bodily shame. Respondents rate items on a 4-point Likert scale ranging from 1 (not at all) to 4 (very much), with higher scores indicating greater experiences of shame. The ESS has demonstrated strong internal consistency and good convergent and discriminant validity in previous studies. Its three-factor structure has been supported across different populations, and its psychometric properties have been validated in various cultural settings, including studies conducted with Iranian participants, confirming its reliability and applicability in the current research context.

The Difficulties in Emotion Regulation Scale (DERS). Emotion regulation difficulties were assessed using the Difficulties in Emotion Regulation Scale developed by Gratz and Roemer in 2004. This instrument includes 36 items measuring six dimensions of emotion regulation difficulties: non-acceptance of emotional responses, difficulties engaging in goal-directed behavior, impulse control difficulties, lack of emotional awareness, limited access to emotion regulation strategies, and lack of emotional clarity. Items are rated on a 5-point Likert scale ranging from 1 (almost never) to 5 (almost always), with higher scores indicating greater difficulties in emotion regulation. The DERS has shown excellent internal consistency, test-retest reliability, and construct validity in numerous studies. Its psychometric properties have also been confirmed in Iranian populations, supporting its use as a reliable and valid measure in the present study.

The Rosenberg Self-Esteem Scale (RSES). Self-esteem was measured using the Rosenberg Self-Esteem Scale developed by Rosenberg in 1965, one of the most widely used instruments for assessing global self-worth. The scale consists of 10 items rated on a 4-point Likert scale ranging from strongly agree to strongly disagree. It includes both positively and negatively worded items, with reverse scoring applied where appropriate. Higher total scores indicate higher levels of self-esteem. The RSES has consistently demonstrated strong reliability and validity across diverse populations and cultural contexts. Numerous studies have confirmed its internal consistency and construct validity, and its psychometric properties have also been validated in Iranian samples, indicating that it is a suitable tool for assessing self-esteem in this study.

### *Data Analysis*

Data analysis was conducted using a combination of SPSS version 27 and AMOS version 24. Initially, descriptive statistics including means, standard deviations, skewness, and kurtosis were computed to examine the distribution of variables and ensure normality assumptions. Pearson correlation coefficients were calculated to assess bivariate relationships among the study variables. Prior to structural modeling, assumptions such as multicollinearity, normality, and absence of outliers were evaluated. Structural equation modeling (SEM) was then employed to test the hypothesized model and examine both direct and indirect relationships among social anxiety, self-criticism, shame, emotion regulation, and self-esteem. Model fit was evaluated using multiple fit indices, including chi-square to degrees of freedom ratio ( $\chi^2/df$ ), Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Normed Fit Index (NFI), and Root Mean Square

Error of Approximation (RMSEA). Mediation effects were assessed using bootstrapping procedures with 2000 resamples to estimate the significance of indirect effects. A significance level of  $p < 0.05$  was considered for all statistical tests.

## Findings and Results

The demographic characteristics of the participants indicated that the sample consisted of 360 university students from Tehran, of whom 198 (55.00%) were female and 162 (45.00%) were male. The age of participants ranged from 18 to 32 years, with a mean age of 23.41 years ( $SD = 3.27$ ). In terms of educational level, 248 participants (68.89%) were undergraduate students and 112 (31.11%) were graduate students. Regarding marital status, the majority of participants were single (82.78%), while 17.22% were married. Field of study distribution showed that 41.67% were enrolled in humanities, 34.72% in engineering, and 23.61% in basic sciences. Preliminary screening of the data indicated no missing values, and assumptions of normality were supported as skewness and kurtosis indices for all variables fell within the acceptable range ( $\pm 2$ ), indicating suitability for parametric analyses.

**Table 1. Descriptive Statistics and Correlation Matrix of Study Variables**

Variable	Mean	SD	1	2	3	4	5
1. Social Anxiety	48.37	12.64	1				
2. Self-Criticism	72.18	15.27	0.54**	1			
3. Shame	61.42	13.58	0.49**	0.57**	1		
4. Emotion Regulation Difficulties	89.76	17.92	0.52**	0.48**	0.51**	1	
5. Self-Esteem	21.63	5.84	-0.46**	-0.59**	-0.53**	-0.47**	1

Note. \*\* $p < 0.01$

The results presented in Table 1 indicate that the mean levels of social anxiety, self-criticism, shame, emotion regulation difficulties, and self-esteem were within expected ranges for a non-clinical student population, with moderate variability across measures. Correlation analysis revealed that social anxiety was positively and significantly associated with self-criticism ( $r = 0.54$ ,  $p < 0.01$ ), shame ( $r = 0.49$ ,  $p < 0.01$ ), and emotion regulation difficulties ( $r = 0.52$ ,  $p < 0.01$ ), while it was negatively correlated with self-esteem ( $r = -0.46$ ,  $p < 0.01$ ). Additionally, self-criticism showed strong positive correlations with shame ( $r = 0.57$ ,  $p < 0.01$ ) and emotion regulation difficulties ( $r = 0.48$ ,  $p < 0.01$ ), and a substantial negative correlation with self-esteem ( $r = -0.59$ ,  $p < 0.01$ ). These findings suggest that higher levels of maladaptive self-evaluative processes are associated with greater emotional dysregulation and lower self-worth, providing preliminary support for the hypothesized relationships.

**Table 2. Results of Structural Equation Modeling: Direct Effects**

Path	$\beta$	SE	t	p
Self-Criticism → Social Anxiety	0.31	0.06	5.17	<0.001
Shame → Social Anxiety	0.24	0.05	4.68	<0.001
Emotion Regulation → Social Anxiety	0.28	0.07	4.02	<0.001
Self-Esteem → Social Anxiety	-0.26	0.06	-4.33	<0.001

The direct effects presented in Table 2 demonstrate that self-criticism, shame, and emotion regulation difficulties all had significant positive effects on social anxiety, whereas self-esteem had a significant negative effect. Specifically, self-criticism emerged as the strongest predictor ( $\beta = 0.31$ ), indicating that

individuals with higher levels of self-critical tendencies are more likely to experience elevated social anxiety. Emotion regulation difficulties ( $\beta = 0.28$ ) and shame ( $\beta = 0.24$ ) also significantly contributed to increased social anxiety, reflecting the role of maladaptive emotional processing and negative self-conscious emotions. In contrast, self-esteem showed a protective role ( $\beta = -0.26$ ), suggesting that higher levels of self-worth are associated with reduced social anxiety. All paths were statistically significant at  $p < 0.001$ , confirming the robustness of these direct relationships.

**Table 3. Indirect Effects via Mediators (Bootstrapping Results)**

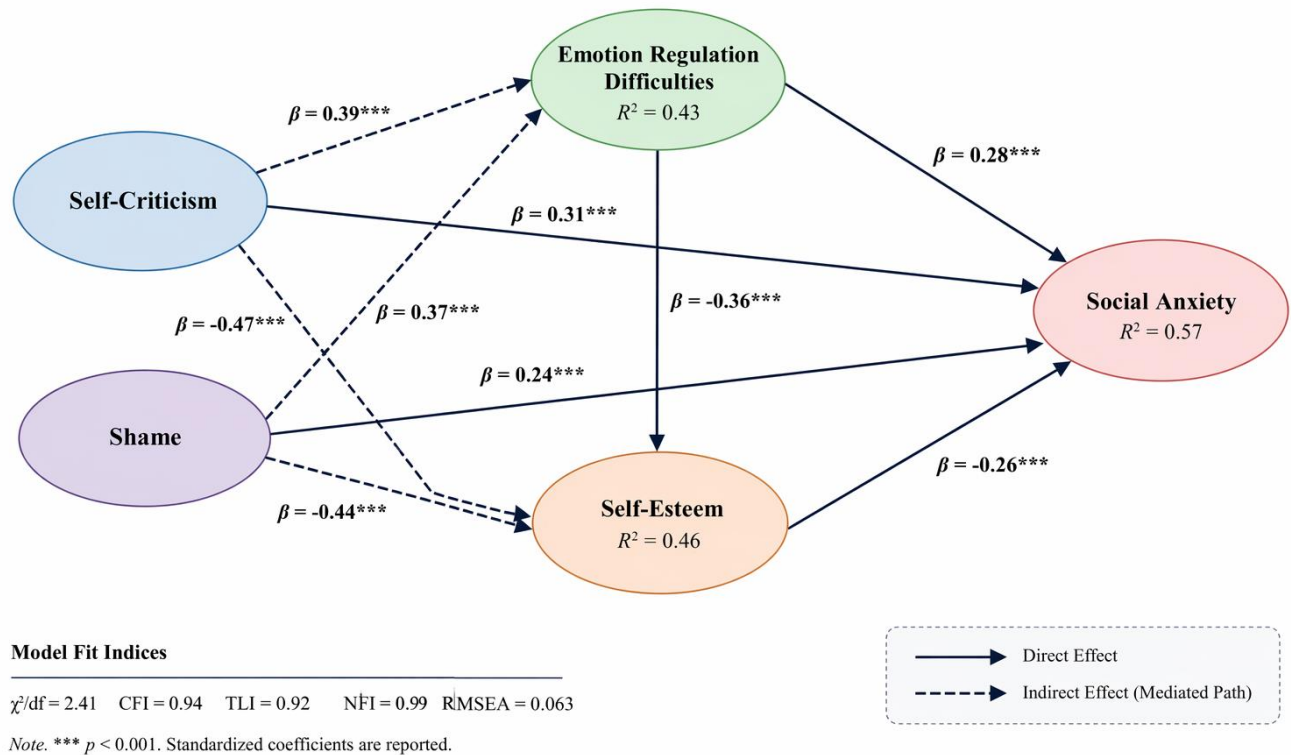
Path	Indirect Effect	Boot SE	95% CI Lower	95% CI Upper
Self-Criticism → Emotion Regulation → Social Anxiety	0.12	0.03	0.07	0.18
Self-Criticism → Self-Esteem → Social Anxiety	0.15	0.04	0.09	0.22
Shame → Emotion Regulation → Social Anxiety	0.11	0.03	0.06	0.17
Shame → Self-Esteem → Social Anxiety	0.13	0.03	0.08	0.19

The results of bootstrapping analysis shown in Table 3 indicate that both emotion regulation difficulties and self-esteem significantly mediated the relationships between self-criticism, shame, and social anxiety. The indirect effects were statistically significant as the confidence intervals did not include zero. Specifically, self-criticism influenced social anxiety through both emotion regulation ( $\beta = 0.12$ ) and self-esteem ( $\beta = 0.15$ ), indicating partial mediation. Similarly, shame demonstrated significant indirect effects through emotion regulation ( $\beta = 0.11$ ) and self-esteem ( $\beta = 0.13$ ). These findings confirm that the impact of self-critical and shame-related processes on social anxiety is not only direct but also operates through disruptions in emotional regulation and diminished self-esteem.

**Table 4. Model Fit Indices**

Fit Index	Value	Acceptable Threshold
$\chi^2/df$	2.41	< 3
CFI	0.94	> 0.90
TLI	0.92	> 0.90
NFI	0.91	> 0.90
RMSEA	0.063	< 0.08

The model fit indices reported in Table 4 indicate that the proposed structural model demonstrated a good fit to the data. The chi-square to degrees of freedom ratio ( $\chi^2/df = 2.41$ ) was within the acceptable range, suggesting an adequate fit. Incremental fit indices including CFI (0.94), TLI (0.92), and NFI (0.91) all exceeded the recommended threshold of 0.90, indicating strong model fit. Additionally, the RMSEA value of 0.063 fell below the cutoff of 0.08, further supporting the adequacy of the model. Collectively, these indices confirm that the hypothesized structural relationships among variables are well-supported by the empirical data.



**Figure 1. Final Structural Model of the Relationships Among Study Variables**

The final structural model illustrates the direct and indirect pathways linking self-criticism and shame to social anxiety through the mediating roles of emotion regulation difficulties and self-esteem. Standardized path coefficients indicate that self-criticism and shame exert both direct and mediated influences on social anxiety, with emotion regulation and self-esteem serving as significant intervening variables. The model highlights the complex interplay between cognitive-emotional vulnerabilities and regulatory processes in predicting social anxiety among university students.

## Discussion and Conclusion

The present study aimed to examine a structural model of social anxiety in university students based on self-criticism and shame, with the mediating roles of emotion regulation and self-esteem. The findings demonstrated that self-criticism, shame, and emotion regulation difficulties were significant positive predictors of social anxiety, while self-esteem showed a significant negative association with social anxiety. In addition, the results confirmed that emotion regulation and self-esteem played meaningful mediating roles in the relationships between self-criticism, shame, and social anxiety. Overall, the proposed structural model exhibited good fit indices, suggesting that the hypothesized relationships among variables were empirically supported.

The finding that self-criticism significantly predicts social anxiety is consistent with cognitive theories emphasizing the role of negative self-evaluation in the development and maintenance of anxiety disorders. Individuals with high levels of self-criticism tend to interpret social situations as threatening and anticipate negative evaluation from others, which intensifies anxious responses. This result aligns with previous empirical studies indicating that self-criticism is strongly associated with maladaptive emotional outcomes, including anxiety and interpersonal distress (7, 9). Furthermore, the current finding supports theoretical

perspectives suggesting that self-critical individuals possess heightened sensitivity to perceived social rank and rejection, which can exacerbate anxiety symptoms (10, 11). The magnitude of the direct effect observed in this study indicates that self-criticism is not only a background vulnerability but also an active cognitive mechanism contributing to social anxiety.

Similarly, the significant effect of shame on social anxiety highlights the importance of self-conscious emotions in shaping individuals' responses to social contexts. Shame involves a global negative evaluation of the self and is inherently linked to concerns about how one is perceived by others. The present findings are consistent with previous research demonstrating that shame is a central emotional component of social anxiety and contributes to avoidance behaviors and heightened self-monitoring (12, 13). Empirical evidence suggests that individuals experiencing high levels of shame are more likely to withdraw from social interactions and engage in safety behaviors that maintain anxiety (14, 15). The results of this study further support the notion that shame is not merely a co-occurring emotion but a key predictor of social anxiety, reinforcing its role within cognitive-affective models of anxiety disorders.

The positive relationship between emotion regulation difficulties and social anxiety observed in this study underscores the critical role of regulatory processes in psychological functioning. Individuals who struggle to effectively manage their emotional experiences are more likely to experience prolonged and intensified negative affect, which contributes to anxiety. This finding is in line with previous studies indicating that deficits in emotion regulation are associated with various forms of psychopathology, including anxiety disorders (3, 20). Moreover, maladaptive regulation strategies such as suppression, avoidance, and rumination have been shown to maintain and exacerbate social anxiety symptoms by preventing the processing and resolution of emotional experiences (19, 21). The current findings provide further evidence that emotion regulation difficulties function as a proximal mechanism linking cognitive and emotional vulnerabilities to anxiety outcomes.

In contrast, the negative association between self-esteem and social anxiety highlights the protective role of positive self-evaluation. Individuals with higher self-esteem are more likely to perceive themselves as competent and worthy, which reduces their sensitivity to social evaluation and rejection. This result is consistent with previous research demonstrating that low self-esteem is a significant risk factor for anxiety and depression (23, 24). Theoretical frameworks such as hierometer theory suggest that self-esteem serves as an internal indicator of social acceptance, influencing emotional and behavioral responses in social situations (11). Additionally, empirical studies have shown that interventions aimed at enhancing self-esteem can lead to reductions in social anxiety symptoms, further supporting its protective function (4, 25). The findings of the present study reinforce the importance of self-esteem as a key variable in understanding and addressing social anxiety.

One of the most significant contributions of this study lies in the identification of emotion regulation and self-esteem as mediating variables in the relationships between self-criticism, shame, and social anxiety. The results indicated that both mediators partially explained these relationships, suggesting that the effects of self-criticism and shame on social anxiety are transmitted through disruptions in emotional regulation and negative self-evaluation. This finding is consistent with prior research highlighting the mediating role of emotional processes in the link between cognitive vulnerabilities and psychological outcomes (19, 22). Specifically, individuals with high levels of self-criticism and shame may experience difficulties in regulating

their emotions, leading to increased anxiety. At the same time, these individuals are likely to develop low self-esteem, which further amplifies their vulnerability to social anxiety.

The mediating role of self-esteem also aligns with social rank theory, which posits that individuals' perceptions of their social standing influence their emotional experiences and behavior. According to this perspective, self-criticism and shame may lower perceived social rank, leading to decreased self-esteem and increased anxiety (10, 11). The findings of the present study support this theoretical framework by demonstrating that self-esteem serves as a key pathway through which cognitive and emotional vulnerabilities impact social anxiety. Furthermore, the combined mediating effects of emotion regulation and self-esteem highlight the interconnected nature of cognitive, emotional, and self-related processes, emphasizing the need for integrative models in understanding psychological disorders.

These findings also have important implications for the conceptualization of social anxiety as a transdiagnostic condition influenced by multiple interacting factors. The significant relationships observed among self-criticism, shame, emotion regulation, and self-esteem suggest that social anxiety cannot be fully understood in isolation but must be examined within a broader network of psychological processes. This perspective is supported by previous research indicating that these variables are common across various forms of psychopathology and contribute to a range of emotional and behavioral outcomes (6, 30). Additionally, the role of social avoidance as a behavioral manifestation of these processes further underscores the complexity of social anxiety and its maintenance mechanisms (32).

Moreover, the present findings are consistent with developmental and contextual perspectives emphasizing the influence of early experiences and environmental factors on psychological functioning. Research has shown that experiences such as humiliation, rejection, and trauma can contribute to the development of self-criticism and shame, which in turn increase vulnerability to social anxiety (16, 17). Similarly, family dynamics and social environments play a crucial role in shaping emotion regulation abilities and self-esteem, highlighting the importance of considering contextual factors in understanding anxiety disorders (26, 27). The current study extends this literature by demonstrating how these factors interact within a structural model to predict social anxiety in university students.

In addition, the findings align with cross-cultural research suggesting that the mechanisms underlying social anxiety are influenced by cultural norms and expectations. While the present study focused on students in Tehran, the observed relationships among variables are consistent with findings from diverse cultural contexts, indicating the generalizability of these processes (29). However, cultural factors may influence the expression and interpretation of self-criticism, shame, and self-esteem, suggesting the need for culturally sensitive approaches in both research and intervention.

Despite its contributions, the present study has several limitations that should be acknowledged. First, the cross-sectional design limits the ability to draw causal inferences about the relationships among variables. Longitudinal studies are needed to examine the temporal dynamics and directionality of these relationships. Second, the reliance on self-report measures may introduce response biases, such as social desirability and common method variance. Third, the sample was limited to university students in Tehran, which may restrict the generalizability of the findings to other populations and cultural contexts. Finally, although the study examined key psychological variables, other relevant factors such as personality traits, coping strategies, and environmental influences were not included in the model.

Future research should address these limitations by employing longitudinal and experimental designs to better understand the causal mechanisms underlying social anxiety. Additionally, incorporating multi-method approaches, including behavioral assessments and physiological measures, could provide a more comprehensive understanding of the constructs under investigation. Expanding the sample to include diverse populations and cultural contexts would also enhance the generalizability of the findings. Furthermore, future studies could explore additional mediating and moderating variables, such as resilience, social support, and cognitive biases, to develop more comprehensive models of social anxiety.

From a practical perspective, the findings of this study have important implications for the development of interventions aimed at reducing social anxiety. Therapeutic approaches should focus on reducing self-criticism and shame, enhancing emotion regulation skills, and improving self-esteem. Cognitive-behavioral interventions, emotion-focused therapies, and self-compassion-based approaches may be particularly effective in addressing these processes. Educational and counseling programs in university settings can also play a crucial role in promoting psychological well-being by providing students with the skills and resources needed to manage social anxiety. Additionally, creating supportive and inclusive environments that reduce stigma and encourage positive social interactions may help mitigate the impact of social anxiety on students' academic and personal lives.

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### **Authors' Contributions**

All authors equally contributed to this study.

### **Declaration of Interest**

The authors of this article declared no conflict of interest.

### **Ethical Considerations**

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants.

### **Transparency of Data**

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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