


The Effect of Negative Physical Self on Social Anxiety in College Students: The Bidirectional Chain Mediation Roles of Fear of Negative Evaluation and Regulatory Emotional Self-Efficacy

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Purpose: The detrimental effects of social anxiety on college students require urgent mitigation. To explore the influencing factors and underlying mechanisms of social anxiety among college students, this study aims to examine the relationship between negative physical self and social anxiety, and the mediating effects of fear of negative evaluation and regulatory emotional self-efficacy.

Methods: The Negative Physical Self Scale, Brief Fear of Negative Evaluation Scale, Regulatory Emotional Self-Efficacy Scale, and Interaction Anxiousness Scale were administered to 924 Chinese college students. SPSS 26.0 was used for analysis, and the Bootstrap method was used to test the significance level of the mediating effect.

Results: Negative physical self was significantly and positively related to social anxiety in college students. Fear of negative evaluation and regulatory negative emotional self-efficacy played independent mediating roles between negative physical self and social anxiety. Fear of negative evaluation and regulatory negative emotional self-efficacy showed a bidirectional chain mediating effect between negative physical self and social anxiety.

Conclusion: This study elucidates the mechanistic pathways between negative physical self and social anxiety. The relationship between negative physical self and social anxiety is influenced by the mediating effects of fear of negative evaluation, regulatory negative emotional self-efficacy, and the bidirectional chain mediating effect of fear of negative evaluation and regulatory negative emotional self-efficacy. This finding provides a reference for policy makers and educators to develop interventions for social anxiety in college students.

Keywords: negative physical self, fear of negative evaluation, regulatory emotional self-efficacy, social anxiety, college students

Introduction

After entering college, college students are faced with various situations, such as the complexity of interpersonal communication, the inconsistency between self-evaluation and others' evaluation, and the lack of interpersonal experience, which actually leads to social anxiety.¹ Social anxiety (SA) generally refers to the constant fear and pain of being scrutinized by others and the fear of embarrassing oneself when an individual is exposed to one or more social situations², which will lead to heart palpitations, poor speech, excessive sweating, chest tightness in communication. It can not only lead to depression,³ but also affect academic performance,⁴ which is not conducive to the formation of good interpersonal relationships and social difficulties. As early as the 1990s, a study in the United States found that the prevalence of social anxiety among adolescents was 13.45%.⁵ From the end of the last century to 2015, the level of social anxiety among college students in China increased year by year.⁶ The study showed that the detection rate of social anxiety disorder among people over the age of 15 in China is the highest among all anxiety subtypes.⁷ Some studies also found that not only in Guizhou Province in western China, 45.7% of college students have obvious social anxiety,⁸ but

also 65.4% of Chinese college students have social anxiety.¹ Therefore, it is necessary to understand the associated factors and potential mechanisms of social anxiety in Chinese college students.

Negative Physical Self and Social Anxiety

Negative physical self (NPS), also known as body image dissatisfaction (BID), refers to negative body cognition, negative emotional experience, and corresponding behavioral regulation, which is a multidimensional and multi-level system.⁹ Based on self-discrepancy theory,¹⁰ when there is a discrepancy between the individual's real self and the perceived self, it leads to painful experiences and social anxiety. Studies^{11,12} have shown that when individuals have negative self-evaluations or are dissatisfied with their bodies, they fear social interaction and produce social anxiety, especially in adolescents. Some studies¹³⁻¹⁵ have shown that factors such as appearance and weight are strongly related to social anxiety in college students. For example, some studies have found that female college students with a high BMI (body mass index: A measure of how fat and thin the human body is and whether it is healthy), that is, the fatter the body, are more likely to have a strong negative physical self, which in turn is more likely to have social anxiety.^{13,14} In terms of physical appearance factors, previous study found that the negative evaluation of college students' physical appearance positively predicted social anxiety,¹⁵ that is, the lower the evaluation of college students' physical appearance, the more likely they are to have social anxiety. Although some studies have revealed the influence of negative physical self on college students' social anxiety, less attention has been paid to the internal mechanism of how negative physical self affects social anxiety. Therefore, there is a great need to explore the mechanisms by which the negative physical self affects social anxiety in college students.

The Mediating Role of Fear of Negative Evaluation

Fear of negative evaluation (FNE) refers to an emotion in which an individual is afraid of the potential and possible negative evaluation given by others¹⁶ or is distressed by the negative evaluation and expects that others may give him negative evaluation.¹⁷ Its characteristic is that the greater the gap between self-evaluation and others' evaluation, the more sensitive individuals are to others' evaluation¹⁷ and the greater the fear of negative evaluation. According to the social cognitive development mode,¹⁸ with the continuous development of self-awareness, individuals are more sensitive to others' evaluation of themselves and may have a certain fearful emotion. In particular, adolescents pay more attention to how others perceive them in social situations.¹³ Some literature^{19,20} suggests that a negative physical self is significantly positively associated with some domains of fear of negative evaluation. For example, the higher the perceived BMI of adolescents,²¹ the more dissatisfied they are with their appearance,²² and the more dissatisfied they are with physical injuries caused by burns,²³ etc., all lead to their fear of being judged negatively by others based on their appearance in social communication.

In addition, fear of negative evaluation is a significant risk factor for social anxiety.²⁴ According to the cognitive-behavioral model of social anxiety,²⁵ an individual's extreme fear of being negatively evaluated by others during social interaction is a significant feature of social anxiety. That is, when individuals perceive the negative evaluation of others, they may experience anxiety.²⁶ Studies have found that there is a significant positive correlation between fear of negative evaluation and social anxiety;^{27,28} that is, the greater the fear of negative evaluation that individuals feel, the more likely they are to pay attention to some threatening information in social interactions, and thus the greater the level of anxiety. A previous study found that college students who pay too much attention to their appearance,²⁹ experience interpersonal rejection on campus,³⁰ or frequently engage in bullying/being bullied,^{31,32} tend to overestimate or miscalculate the evaluation of others in social communication, and then the more fear of negative evaluation, the higher the level of social anxiety. Therefore, fear of negative evaluation may serve as a mediating factor in the relationship between negative physical self and social anxiety in college students.

The Mediating Role of Regulatory Emotional Self-Efficacy

Self-efficacy refers to an individual's positive cognition and subjective judgment of his or her ability to be competent in a particular field.³³ It is influenced by an individual's positive or negative emotions, especially when an individual has negative emotions. It is easy for individuals to doubt their own abilities and reduce self-efficacy.³⁴ Research has found

that body image has a significant impact on self-efficacy. When individuals have poor body image, their self-evaluation is significantly reduced, thus reducing individual self-efficacy.^{35–37} In the process of social communication, when college students have a negative evaluation of their own bodies, they will have obvious negative emotions such as social anxiety.^{8,11,24} However, studies have further revealed that cognitive emotion management effectively predicts and alleviates social anxiety.^{38–40}

According to the theory of emotional self-efficacy,⁴¹ regulatory emotional self-efficacy (RESE) refers to an individual's belief that he or she has the ability to deal with and regulate various emotions effectively. Including perceived self-efficacy in expressing positive affect (POS) and regulatory negative emotional self-efficacy (NEG) reflects an individual's degree of confidence in whether he can effectively regulate his emotional state.^{42,43} Studies have found that regulatory emotional self-efficacy is closely related to social anxiety,⁴⁴ that is, when individuals have a high levels of regulatory emotional self-efficacy, they can effectively alleviate the impact of negative emotions of social anxiety on individuals. Some studies have also found that there is a significant negative correlation between regulatory emotional self-efficacy and social anxiety in college students,^{45,46} that is, the higher the regulatory emotional self-efficacy of college students, the more they can alleviate their social anxiety, and thus reduce their excessive attachment to pets or prevent the generation of mobile phone addiction. Therefore, regulatory emotional self-efficacy may mediate the relationship between negative physical self and social anxiety in college students.

The Bidirectional Chain-Mediating Role of Fear of Negative Evaluation and Regulatory Emotional Self-Efficacy

Previous studies have discussed that negative physical self leads to individuals' fear of negative evaluation, or negative physical self affects individuals' self-efficacy. However, few have investigated the influence and mechanism of internal factors such as cognition and emotion on negative physical self and social anxiety at the same time. Therefore, this study aims to deeply analyze the mechanism of the influence of various emotional and cognitive reactions caused by negative physical self on college students' social anxiety. According to the cognitive-affective personality system theory,^{47,48} individual cognition (beliefs, self-efficacy) and emotion (mood, emotional response, etc.) are not isolated and static, but interact and influence individual psychology and behavior. Therefore, if an individual has negative thoughts and negative evaluation of his body, the emotional unit (fear of negative evaluation) in his personality will interact with the cognitive unit (regulatory emotional self-efficacy), which may affect his social anxiety.

On the one hand, the more negative fear emotions an individual encounters, the greater the accumulation, and then the confidence in the individual's ability to cope with negative stimuli and the will to resist setbacks will be weakened, and regulatory emotional self-efficacy will be reduced.⁴⁹ Previous studies^{50,51} have found that the higher the level of fear of negative evaluation, the lower the sense of self-efficacy may be, and there is a significant negative correlation between the fear of negative evaluation and regulatory emotional self-efficacy. On the other hand, according to social cognitive theory,⁵² self-efficacy plays a subjective role in one's choice processes, thoughts, motivation, and psychosomatic response. Therefore, the fear of negative evaluation is also based on the individual's assessment of self-efficacy. When individuals perceive that their social ability to manage negative emotions is insufficient to meet the needs of their environment, they may develop lower social efficacy of emotion regulation, which in turn may lead to a range of social anxieties. Previous studies^{53–55} have shown that a negative correlation between regulatory emotional self-efficacy and fear of negative evaluation, especially in studies of learning and nursing evaluation. Therefore, fear of negative evaluation and regulatory emotional self-efficacy may play a bidirectional chain mediating role between negative physical self and social anxiety.

The Current Study

In summary, this study is the first to explore the relationships among negative physical self, fear of negative evaluation, regulatory emotional self-efficacy, social anxiety in Chinese college students by investigating the internal mechanisms between these four factors. Our hypotheses are as follows:

H1: Negative physical self positively predicts social anxiety in college students.

H2: Fear of negative evaluation mediates the relationship between negative physical self and social anxiety in college students.

H3: Regulatory emotional self-efficacy mediates the relationship between negative physical self and social anxiety in college students.

H4: Fear of negative evaluation and regulatory emotional self-efficacy show a bidirectional chain mediating effect between negative physical self and social anxiety in college students.

Methods

Participants

This is a cross-sectional study and data were collected using the convenience sampling method. Questionnaires were distributed to college students in Anhui Province of China via the “Questionnaire Star” system. They accessed the online survey by scanning the quick response code of the questionnaire with their mobile phones.

Initially, 985 questionnaires were distributed and 924 questionnaires were collected, with a validity rate of 93.8%. The mean age of the participants was 19.28 (SD=1.25, ranging from 17 to 22), including 458 males (49.6%) and 466 females (50.4%). 488 participants (52.8%) majored in literature and history, 348 participants (37.7%) majored in science and engineering, and 88 participants (9.5%) majored in other categories.

Measures

Negative Physical Self Scale (NPSS)—Chinese Version

The instrument used in this study was the Perception of the Negative Physical Self, updated by Chen.⁵⁶ Forty-eight items comprise the scale, which is divided into five dimensions: concern about shortness, concern about fatness, concern about thinness, concern about facial appearance, and concern about general appearance. A 5-point rating system is used for each item: 0 represents “never” and 4 represents “always”. Sample items are as follows: “I worry about my appearance”, “I exercise to lose weight”. The higher the score, the greater the dissatisfaction with the physical self. The Cronbach’s alpha of the scale in the current research was 0.88.

Brief Fear of Negative Evaluation Scale (BFNES)—Chinese Version

In this study, the instrument used was the Perception of Fear of negative evaluation, created by Leary⁵⁷ and updated by Chen.¹⁷ The measure consists of 12 items, such as “I’m afraid of not getting the approval of others”. A 5-point rating system is used for each item: 1 (not at all) and 5 (completely). The higher the sum of all items, the more negative the fear of negative evaluation. The Cronbach’s alpha of the scale in the current study was 0.90.

Regulatory Emotional Self-Efficacy Scale (RESE)—Chinese Version

In this study, the tool employed was the Scale of Regulatory Emotional Self-efficacy, created by Caprara⁵⁸ and updated by Wen et al.⁵⁹ The 12 items of the measure are divided into two categories: regulatory positive emotional self-efficacy and regulatory negative emotional self-efficacy. Sample items are as follows: “When someone deliberately trouble me, I can avoid annoyance”. A 5-point rating system is used for each item, with 1 representing “very inconsistent” and 5 representing “very consistent”. A higher score indicates a higher level of regulatory emotional self-efficacy. In this study, the Cronbach’s alpha of the scale was 0.83.

Interaction Anxiousness Scale (IAS)—Chinese Version

The Interaction Anxiousness Scale created by Leary⁶⁰ and updated by Peng et al⁶¹ was used in this study. The measure consists of 15 items, such as “I rarely feel anxious in social situations”. A 5-point rating system is used for each item, with 1 representing “not at all” and 5 representing “very consistently”. The higher the total score, the more severe the social anxiety. In this study, the Cronbach’s alpha of the scale was 0.85.

Data Analysis

First, descriptive statistics and Pearson correlation coefficients between key variables were calculated using SPSS 26.0. Second, Model 6 in the SPSS macro program PROCESS was used to examine the mediating role. Standardized path coefficients were expressed as β , with $p < 0.05$ indicating that the path was statistically significant. Finally, the current study randomly sampled 5000 times from the data using the bootstrapping method, and the 95% bootstrap confidence interval (CI) without zero indicates a significant effect. Gender, age, and major were included as covariates, with gender and major treated as dummy variables.

Results

Common Method Deviation Test

An exploratory factor analysis of each variable was performed using the single-factor test and following Harman. Nine factors with a latent root greater than the test found one. Of these, the first component (ie, no significant technique bias) explained 18.03% of the variation, which is less than the critical value of 40%.

Associations Between Variables

According to the correlation analysis (see Table 1), negative physical self was positively correlated with fear of negative evaluation and social anxiety and negatively correlated with regulatory negative emotional self-efficacy. Fear of negative evaluation negatively correlated with regulatory negative emotional self-efficacy and positively correlated with social anxiety. Regulatory negative emotional self-efficacy and social anxiety are negatively correlated. There was no significant correlation between perceived self-efficacy in expressing positive affect and social anxiety.

Bidirectional Chain Mediation Analysis

In this study, we controlling for gender, age and major, and tested the mediating effect with a 95% confidence interval. An examination of the chain mediation effects of fear of negative evaluation and regulatory negative emotional self-efficacy in negative physical self and social anxiety. Negative physical self significantly positively predicted social anxiety (Total effect: $\beta = 0.46$, $p < 0.001$). When negative physical self, fear of negative evaluation, regulatory negative emotional self-efficacy, and social anxiety were entered simultaneously into the regression equation, the model had a good fit. This model is already a saturated model, and the specific path is shown in Figure 1: Negative physical self significantly positively predicted social anxiety (Direct effect: $\beta = 0.19$, $p < 0.001$) and positively predicted fear of negative evaluation ($\beta = 0.70$, $p < 0.001$), and negatively predicted regulatory negative emotional self-efficacy ($\beta = -0.14$, $p < 0.01$). Fear of negative evaluation significantly negatively predicted regulatory negative emotional self-efficacy ($\beta = -0.36$, $p < 0.001$) and significantly positively predicted social anxiety ($\beta = 0.33$, $p < 0.001$). Regulatory negative emotional self-efficacy significantly negatively predicted social anxiety ($\beta = -0.11$, $p < 0.001$).

The results of mediation effect analysis show that (Table 2), the negative physical self has effect on social anxiety not only through the independent mediating effect of fear of negative evaluation and regulatory negative emotional self-

Table 1 Descriptive Statistics and Correlation Analysis Results (N = 924)

	M±SD	1	2	3	4	5	6	7
1 Gender	—	—						
2 Age	19.28±1.25	-0.16***	1					
3 NPS	1.36±0.43	-0.10**	0.06	1				
4 FNE	3.39±0.76	0.15***	-0.03	0.38***	1			
5 POS	4.05±0.68	0.20***	-0.004	-0.13***	0.07*	1		
6 NEG	3.19±0.71	-0.11**	-0.01	-0.23***	-0.42***	0.26***	1	
7 SA	3.31±0.63	0.15***	0.05	0.29***	0.52***	-0.01	-0.33***	1

Notes: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Abbreviations: NPS, Negative Physical Self; FNE, Fear of negative evaluation; POS, Perceived self-efficacy in expressing positive affect; NEG, Regulatory negative emotional self-efficacy; SA, Social anxiety.

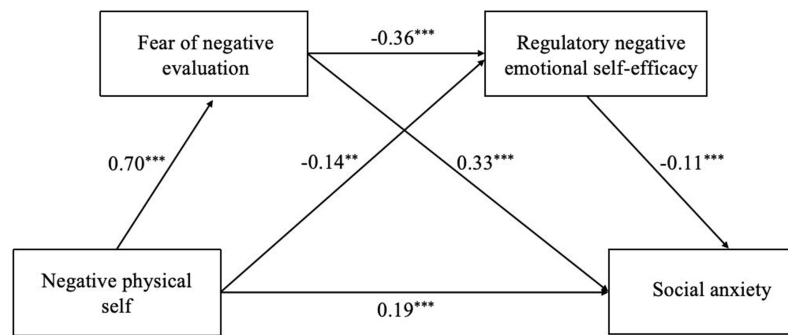


Figure 1 The chain mediated model of Fear of negative evaluation and Regulatory negative emotional self-efficacy (**p <0.01, ***p <0.001).

efficacy, but also through the chain mediating effect of fear of negative evaluation and regulatory negative emotional self-efficacy. The confidence interval of the three paths of mediation effect does not include 0. The specific path is as follows: (1) Negative physical self—fear of negative evaluation—social anxiety (effect size: 0.232); (2) Negative physical self—fear of negative evaluation—regulatory negative emotional self-efficacy—social anxiety (effect size: 0.027); (3) Negative physical self—regulatory negative emotional self-efficacy—social anxiety (effect size: 0.015). The mediating effect of the first path accounted for the largest proportion of the indirect effect (84.98%).

Testing the chain mediation effect of regulatory negative emotional self-efficacy and fear of negative evaluation in negative physical self and social anxiety. This model is already a saturated model, and the specific path is shown in [Figure 2](#): Negative physical self significantly positively predicted social anxiety ($\beta=0.19$, $p <0.001$) and fear of negative evaluation ($\beta=0.56$, $p <0.001$), and negatively predicted regulatory negative emotional self-efficacy ($\beta=-0.39$, $p <0.001$). Regulatory negative emotional self-efficacy negatively predicted fear of negative evaluation ($\beta=-0.36$, $p <0.001$) and social anxiety ($\beta=-0.11$, $p <0.001$). Fear of negative evaluation positively predicted social anxiety ($\beta=0.33$, $p <0.001$).

The results of the mediation effect analysis show that ([Table 3](#)) negative physical self has affected social anxiety not only through the independent mediating effect of regulatory negative emotional self-efficacy and fear of negative evaluation, but also through the chain mediating effect of regulatory negative emotional self-efficacy and fear of negative evaluation. The confidence interval of the three paths of mediation effect does not include 0. The specific path is as follows: (1) Negative physical self—regulatory negative emotional self-efficacy—social anxiety (effect size: 0.042); (2) Negative physical self—regulatory negative emotional self-efficacy—fear of negative evaluation—social anxiety (effect size: 0.047); (3) Negative physical self—fear of negative evaluation—social anxiety (effect size: 0.185). The mediating effect of the fear of negative evaluation accounted for the largest proportion of the indirect effect (67.77%).

The two chain mediation models are compared: First, both models are saturated. Second, the total indirect effect sizes of the two chain mediations are equal, indicating that the two chain mediations have equal explanatory power. Third, the proportion of the chain mediating effect of regulatory negative emotional self-efficacy - fear of negative evaluation in the overall model (17.22%) was significantly greater than that of fear of negative evaluation - regulatory negative emotional self-efficacy (9.89%); Fourth, the mediating effect of fear of negative evaluation on negative physical self and social anxiety in Model 1 (84.98%) was significantly greater than that in Model 2 (67.77%). Fifth, the mediating effect of

Table 2 The Mediating Effects of Fear of Negative Evaluation and Regulatory Negative Emotional Self-Efficacy

	Indirect Effect Size	Boot SE	Boot LLCI	Boot ULCI	Ratio (%)
Total Indirect effect	0.273	0.030	0.218	0.334	
NPS - FNE - SA	0.232	0.028	0.180	0.288	84.98%
NPS - NEG - SA	0.015	0.009	0.002	0.035	5.49%
NPS - FNE - NEG - SA	0.027	0.009	0.011	0.046	9.89%

Abbreviations: NPS, Negative physical self; FNE, Fear of negative evaluation; NEG, Regulatory negative emotional self-efficacy; SA, Social anxiety.

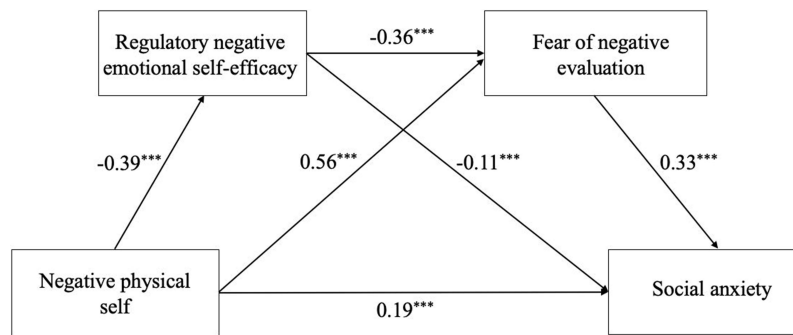


Figure 2 The chain mediated model of Regulatory negative emotional self-efficacy and Fear of negative evaluation (***p <0.001).

regulatory negative emotional self-efficacy on negative physical self and social anxiety in Model 2 (15.38%) was significantly greater than that in Model 1 (5.49%).

Discussion

This study endeavored to explore the relationship between negative physical self, fear of negative evaluation, regulatory emotional self-efficacy and social anxiety among college students and how fear of negative evaluation, regulatory emotional self-efficacy serve as mediators in this relationship. The results indicated that negative physical self, fear of negative evaluation and regulatory negative emotional self-efficacy are significant predictors of social anxiety among Chinese college students. Furthermore, fear of negative evaluation and regulatory negative emotional self-efficacy seem to act as independent and sequential mediators in the relationship between negative physical self and social anxiety.

Negative Physical Self and Social Anxiety

Our results confirmed Hypothesis 1, that negative physical self is robustly positively associated with social anxiety, which is consistent with previous studies that adolescents are more prone to social anxiety when there are high levels of negative physical self among college students.^{11,12} Self-discrepancy theory can explain this phenomenon. According to this theory, when there is a discrepancy between the individual's real self and the perceived self, it leads to painful experiences and social anxiety.^{9,10} Specifically, with the development of self-awareness, adolescents tend to pay more attention to their own appearance image in social communication, and then form a subjective image of longing for the ideal body, that is, the ideal physical self.⁹ However, this ideal physical self is difficult to recognize and understand when it differs from the real physical self. College students will have negative cognition and negative evaluation of appearance, height, and body shape, and then induce social anxiety.⁶²

The Mediating Role of Fear of Negative Evaluation

This study provides support for Hypothesis 2, which suggests that fear of negative evaluation is a mediator between negative physical self and social anxiety among Chinese college students. This finding suggests that the more dissatisfied college students are with their body or appearance, the more likely they are to have negative self-evaluation and fear of

Table 3 The Mediating Effects of Regulatory Negative Emotional Self-Efficacy and Fear of Negative Evaluation

	Indirect Effect Size	Boot SE	Boot LLCI	Boot ULCI	Ratio (%)
Total Indirect effect	0.273	0.030	0.217	0.334	
NPS - NEG - SA	0.042	0.016	0.015	0.076	15.38%
NPS - FNE - SA	0.185	0.026	0.137	0.237	67.77%
NPS - NEG -FNE - SA	0.047	0.011	0.028	0.069	17.22%

Abbreviations: NPS, Negative physical self; FNE, Fear of negative evaluation; NEG, Regulatory negative emotional self-efficacy; SA, Social anxiety.

negative evaluation, which leads to more social anxiety. Our research lends further credence to the cognitive-behavioral model of social anxiety.²⁵ According to this theory, individuals tend to view themselves as the object of social cognition and use self-cognitive information to infer others' evaluations of them, leading to fear of negative evaluation and social anxiety.⁶³ When college students evaluate their bodies negatively, they will be more concerned about others' views of their bodies or physical images in the process of social interaction, and then form self-psychological representations, that is, "observe themselves as objects", and tend to focus on their mental representations from an observer's perspective (eg, they must think I am ugly).⁶⁴ If students fear negative evaluation in social interactions, they will perceive the social situation as dangerous and avoid negative evaluation from others for protection. However, this only increases the likelihood of social anxiety.⁶⁵ On the contrary, when the level of fear of negative evaluation is low, it is easy to feel the positive evaluation of others and experience less social anxiety.

The Mediating of Regulatory Negative Emotional Self-Efficacy

This study found that perceived self-efficacy in expressing positive affect had no mediating effect between negative physical self and social anxiety among Chinese college students. This is consistent with previous studies showing that there is no interaction between positive emotion regulation efficacy and problem behaviors and negative emotions.^{43,66,67} The reason is that regulatory emotional self-efficacy produces positive or negative functions, which are usually directly related to individual psychology and behavior.⁴³ In other words, positive psychology and behavior directly interact with self-efficacy in expressing positive emotions. In contrast, negative psychology and behavior directly interact with regulatory negative emotional self-efficacy. It refers to a person's ability or belief to regulate negative emotions (including anger, disappointment, fear, etc.) in times of adversity or frustration.⁴³ It is characterized by general functioning in negative events, and the higher the regulatory negative emotional self-efficacy, the easier it is for the individual to avoid the effects of negative emotions. Therefore, when college students have negative physical self-perception and social anxiety, the regulatory negative emotional self-efficacy plays a role with negative emotions.

The present study partially confirmed Hypothesis 3 by demonstrating that regulatory negative emotional self-efficacy plays an intermediary role in the relationship between negative physical self and social anxiety among Chinese college students. This indicates that when college students have negative cognitive evaluation of their bodies, they tend to deny their ability to manage negative emotions, and then believe that due to their limited ability, they cannot effectively deal with the information of negative cognition, and the higher the possibility of social anxiety. This study not only proves once again the role of emotion regulation in social anxiety,⁴⁸ but also confirms the theory of emotional self-efficacy,⁶⁸ that is, when individuals have confidence in their emotion management, especially believe that they can manage negative emotions, they may believe that they can effectively regulate their emotions to cope with the impact of negative emotions; On the contrary, when individuals lack confidence in managing negative emotions, they believe that they not only lack sufficient ability, but also cannot adopt effective emotional regulation to cope with negative information such as negative cognition, which may further lead to negative emotions such as anxiety⁶⁹ and depression.⁷⁰ Therefore, when college students are more dissatisfied with their appearance, height, weight, etc., they will pay too much attention to such negative cognitive evaluation and produce cognitive distortion;⁷¹ that is, they will deny their ability to manage negative emotions and adopt inappropriate emotional regulation methods, which will further lead to social anxiety.

The Bidirectional Chain Mediating of Fear of Negative Evaluation and Regulatory Negative Emotional Self-Efficacy

This study is the first to verify Hypothesis 4, which suggests that fear of negative evaluation and regulatory negative emotional self-efficacy show a bidirectional chain mediating effect in the relationship between negative physical self and social anxiety. This study further supports the cognitive-affective personality system theory, which posits that the negative physical self triggers the interaction between emotional factors (fear of negative evaluation) and cognitive factors (regulatory negative emotional self-efficacy).^{47,48} On the one hand, negative physical self leads to the fear of negative evaluation, which leads a decrease in emotional self-efficacy.^{51,53} College students' negative evaluation and perception of their bodies cause them to worry about others' negative evaluation of them, which produces fear emotions,

which may lead to their denial of emotional regulation ability and be affected by fear emotions, and finally, cause social anxiety.

On the other hand, regulatory negative emotional self-efficacy plays an essential role in managing emotions. Low self-efficacy of individual negative emotion regulation will make individuals recognize their inability and lack of confidence as a whole,⁷² and thus produce fear of negative evaluation. The negative evaluation and perception of physical self will lead to a lack of self-confidence of college students, reduce their self-efficacy of emotional regulation, and then feel more afraid of others' evaluation of their bodies, and finally induce social anxiety with the accumulation of fear. On the contrary, when an individual has a good sense of self-efficacy in managing negative emotions, the individual can recognize their ability to resist the influence of negative emotions as a whole so that the individual has confidence and ability to deal with negative emotions and then alleviate the impact of negative emotions on the individual. Therefore, the results of this study pointed out the hypothesis of the interaction between cognitive factors and affective factors in the cognitive-affective personality system theory and innovatively explained the relationship between the negative physical self and social anxiety of college students, as well as the internal mechanism.

Recommendations and Limitations

Based on previous research and the above theories, this study constructed a bidirectional chain mediation model to explain the impact of negative physical self on social anxiety. This is the first study to construct a bidirectional chain mediation model from the two personality unit dimensions of cognition and emotion and validates the above theories, further enriching and promoting the theoretical research on social anxiety. The practical significance is that this study provides psychological guidance and suggestions for college educators and college students to prevent and reduce social anxiety. Whether it is college counselors, class teachers, psychological counseling workers, or college students, they can recognize their interaction in influencing social anxiety from the dual path of cognitive and emotional units. On the one hand, college educators should fully enhance the support and trust of classmates and teachers, help students change their bad cognitive concepts,³⁴ and establish correct self-evaluation understanding to prevent and alleviate the occurrence of college students' social anxiety. On the other hand, this study once again confirms that regulatory negative emotional self-efficacy is important in preventing and alleviating social anxiety. This indicates that college counselors, class teachers, and other educators can improve the emotional management ability of college students by teaching emotion management strategies, enhancing the regulatory negative emotional self-efficacy of college students, and then alleviating the social anxiety.

Of course, the current study has several drawbacks. First, data were collected using a questionnaire survey; these procedures are less rigorous and different from experimental methods. Further studies may consider combining behavioral studies with fMRI or ERP studies. Second, the cross-sectional design did not show a longitudinal effect of negative physical self on social anxiety. Future research should use a longitudinal or experimental design to test the causal hypothesis. Third, the research sample is relatively small for the population of college students in China, which may limit the generalizability of the findings. A larger and more representative sample is needed for future studies. Finally, the subjects in this study are all Chinese college students, excluding international students in China. Future studies could increase the proportion of international students in China and further investigate the influence of Chinese cultural factors on their social anxiety, such as the role of acculturation factors.⁷³

Conclusion

This is the first study to construct a bidirectional chain mediation model to explore the mechanisms underlying the effect of negative physical self on social anxiety among college students. Our results indicate that negative physical self not only directly influences social anxiety, but also indirectly influences it. The indirect influence occurs through the separate mediating roles of fear of negative evaluation and regulatory negative emotional self-efficacy, as well as their bidirectional chain mediation effect. These empirical findings shed light on the intricate dynamics between the negative physical self and social anxiety among Chinese college students.

Data Sharing Statement

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

Ethics Approval and Consent to Participate

All the methods were performed in accordance with the Declaration of Helsinki. The study was approved by the Ethical Committee of Anhui Normal University. All the participants provided written informed consent.

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Disclosure

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