

The Influence of College Students' Attribution Styles on Anxiety Levels: The Mediating Role of Rumination Thinking

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Abstract

Objective: To investigate the mechanism by which college students' attribution styles influence anxiety levels, particularly the mediating role of rumination and potential gender differences. **Methods:** Based on attribution style theory and the "adaptive-maladaptive rumination" theory, 369 college students from multiple provinces were selected as research subjects. A one-month questionnaire survey was conducted using the Self-Rating Anxiety Scale (SAS), the Attribution Style Questionnaire (ASQ), and the Rumination Rating Scale (RRS). **Key Findings:** 1) Anxiety is prevalent among college students, with female students exhibiting significantly higher anxiety levels than male students; 2) Anxiety levels are significantly negatively correlated with persistent attributions for positive events and significantly positively correlated with internal and global attributions for negative events; 3) In the pathway through which attribution style influences anxiety, rumination plays a fully mediating role (i.e., attribution styles primarily increase anxiety by increasing rumination). **Conclusion:** This study elucidates the mechanism by which attribution styles exacerbate anxiety through rumination, providing a new perspective for understanding mental exhaustion among college students. It suggests that future research could improve overall anxiety among college students by intervening in attribution styles and rumination.

Keywords

Mental Exhaustion, Anxiety among College Students, Attribution Patterns, Rumination Thinking, Social and Cultural Perspectives

1. Introduction

In July 2022, the B station blogger "Yige guess" released "three days back to the

village, the second uncle cured my spiritual internal consumption”, which brought the term “spiritual internal consumption” into the social field of vision, after continuous fermentation, causing widespread resonance. At present, the mental internal depletion of college students has become a common status quo, and the discussion of the phenomenon of mental internal depletion mainly focuses on online media platforms, and there is still a relative lack of systematic academic research. As a social group with the greatest potential for development, the mental health of college students deserves focused attention.

One of the more outward manifestations of mental internal depletion among college students nowadays is anxiety. Anxiety refers to an unpleasant emotion that arises when an individual anticipates some undesirable consequence or ambiguous threat, and is characterised by nervousness, worry, vexation, fear, and dread (Lin et al., 2003). Skrove et al. (2013) surveyed a selection of adolescents between the ages of 13 - 18 years old using a questionnaire method, and found that 13% of the adolescents reported symptoms of depression and anxiety. Bayram and Bilgel's (2008) related study focusing on college students further found that 47.1% of college students currently have moderate or higher anxiety levels, with female college students scoring higher in anxiety, and Verger et al. (2009) study similarly found that 25.7% of college students were psychologically stressed, with more females than males. While the lifetime prevalence of anxiety among Chinese residents is 7.6% (Huang et al., 2019), the detection rate of anxiety among college students is 13.7%, which is showing an increasing trend (Chen et al., 2022b), and the continuous development of anxiety will bring an increasing disease burden to the college student population and the society (Liao et al., 2024). As a common mental health problem among college students, anxiety can not only cause serious psychological problems such as sleep disorders (Chen et al., 2022a) and depression (Barber et al., 2023), but can also penetrate into many aspects of students' lives and have a significant impact on their life satisfaction (Zhang & Liu, 2021), health (Vogelzangs et al., 2010), and individual learning (Vogelzangs et al., 2010) and the individual's learning (Gu et al., 2016), etc., which have a detrimental effect and even lead to self-inflicted suicides (Zhao et al., 2021). Therefore, it is of great practical significance and research value to explore the factors affecting the level of anxiety to further effectively control anxiety and internal conflict.

Attributional style is regarded as an antecedent of anxiety, and the correlation between negative attributional style and high levels of anxiety has been widely recognised (Luten et al., 1997), but research into its specific mechanisms of action needs to be further advanced. Attributional style, also known as “attributional style” or “explanatory style”, refers to an individual's habitual way of thinking about the cause of an event. It refers to how individuals tend to explain the causes of events, which is mostly assessed by their judgement of the causes of multiple events (Li, 2004). In order to study the mechanism of attributional style from the attributional outcome, researchers have made multidimensional classification of attributional outcome. For example, Abramson et al. (1978), from their research on the theory of learned helplessness, used Internal-External, Stable-Unstable,

and Global-Specific as the three dimensions of attributional outcome analysis. Among them, intrinsicity refers to whether individuals attribute the cause of the event to their own traits (e.g., ability, personality) or external circumstances (e.g., luck, others' behavior); persistence refers to whether individuals perceive the cause of the event to be stable and long-lasting (e.g., "I'm never going to learn math") or temporarily variable (e.g., "I didn't review this time well"); and holistic refers to whether individuals judge the influence of the event cause to be widespread (e.g., "I fail at everything I do") or confined to a specific domain (e.g., "I just didn't do well on this test"). Based on this categorisation, Li (2004) found that college students had lower levels of mental health if they tended to attribute the causes of negative events to be intrinsic, holistic, and persistent, while attributing the causes of positive events to be extrinsic, local, and temporary.

Anxiety is an important part of college students' mental health level, and existing studies have demonstrated the strong correlation between attributional style and anxiety. Anxiety states such as social anxiety (Xu, 2010) and academic anxiety (Chen, 2007) all showed strong correlations with attributional styles in data analyses. In addition, it has also been shown that elements such as core self-evaluation (Chen et al., 2017), tolerance for uncertainty (Dugas et al., 1997), and rumination thinking (Liu & Wang, 2017; Hu, 2024) act as mediating variables between attributional styles and anxiety levels. At the same time, anxiety also acts as an antecedent emotion that will counteract attributional style (Qiao et al., 1997). However, in contrast, Luo & Wu (2022) found that there was no direct significant relationship between depressogenic attributional style and anxiety, but rather that it mediated the relationship between self-differentiation and anxiety. That is, conflicting beliefs about oneself influenced depressive attributional style, which in turn affected anxiety levels. Although a significant correlation has been demonstrated between attributional style and anxiety, the specific cognitive mechanisms by which attributional style influences anxiety remain unclear. Therefore, this study will focus on the relationship between attributional styles and college students' anxiety and its possible mediating influences.

Some studies have defined rumination as an important factor influencing depression and anxiety (Thomsen, 2006). For example, some argue that rumination may be a factor influencing cognitive vulnerability, and empirical studies have found that this factor has cross-diagnostic potential for anxiety symptoms following stressful events (Li, He, & Xiao, 2025). According to Reactive Style Theory, rumination refers to an individual's unconscious and sustained attention to his or her thoughts and behaviours, and repeated and sustained thinking about the prevailing emotional state, the causes of the negative event, and its possible consequences (Nolen-Hoeksema, 2000). Conway et al. (2000) viewed ruminative thinking as a personality trait that typically causes individuals to constantly think about negative experiences and emotions. Based on this, Pearson et al. (2008) categorised ruminative thinking into positive and negative ruminations, while Brozovich et al. (2015) argued that ruminative thinking is a passive and repetitive contemplation of negative emotions, which maintains the individual in negative emotions

and ultimately produces self-denial.

Previous empirical studies have found that rumination may be significantly correlated with levels of anxiety. [Nolen-Hoeksema \(1987\)](#) found that rumination was associated with the development of depression and anxiety based on the RST theoretical model. [Harrington et al. \(2002\)](#) suggested that the content of rumination, particularly self (self-focus), correlates with anxiety. [Abbott & Rapee \(2004\)](#) found that temporal hindsight rumination could be reduced by intervening in social anxiety. Meanwhile, [Wadsworth et al. \(2004\)](#) found that this involuntary approach led to greater anxiety and that the link was more pronounced in women. Therefore, the effect of attributional style on anxiety levels may work by engaging in rumination, a conjecture that has also been confirmed by some studies. [Anderson and Dewhurst \(2009\)](#) stated that rumination is a process in which the individual thinks repeatedly about why the event occurred, and tends to make negative attributions but often fails to obtain a rational and objective analysis, resulting in feelings of hopelessness and helplessness. Feelings of hopelessness and helplessness. At the same time, anxious individuals' rumination tends to be directed towards specific descriptions of negative events, and some studies have pointed out that attributional approaches play a role in this, resulting in a certain memory bias ([Stopa & Jenkins, 2007](#)). Taken together, this research suggests that individual attributional styles may modulate the formation of rumination, which in turn improves anxiety levels.

Accordingly, this study proposes **Hypothesis 1**: There is a gender difference in college students' anxiety levels, and women have higher anxiety levels on average; **Hypothesis 2**: There is a positive correlation between rumination and college students' anxiety levels; and **Hypothesis 3**: Rumination can be affected by attributional styles, and act as a mediator in attributional styles affecting college students' anxiety levels. In other words, attributional styles can affect college students' anxiety through a chain mediation effect that affects ruminative thinking levels. See [Figure 1](#) for details.

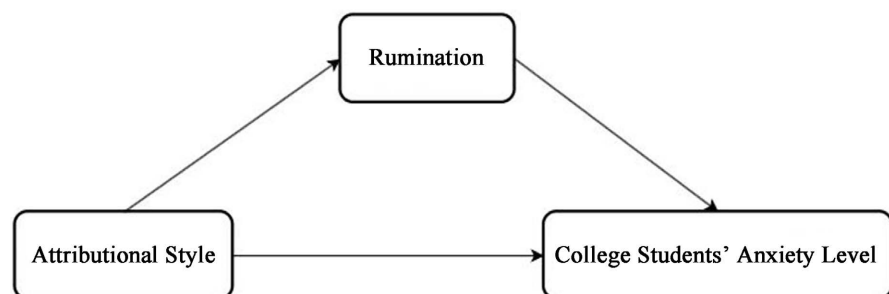


Figure 1. Research hypothesis model.

2. Objects and Methods

2.1. Objects

This survey was conducted in November-December 2024 using the “Questionnaire Star” online platform for college students in several provinces in China, and

all subjects were informed of the purpose of the research. The results feedback report was available after filling out the questionnaire carefully, and informed consent was obtained before filling out the questionnaire. A total of 390 questionnaires were recovered, excluding 21 questionnaires with too short a response time and 21 questionnaires with multiple entries choosing the same option, there were 369 valid questionnaires, and the effective questionnaire recovery rate was 94.6%, of which 75 were male, accounting for 20.3% of the total number of students, and 294 were female, accounting for 79.7% of the total number of students.

2.2. Tools

2.2.1. Self-Rating Anxiety Scale (SAS)

Self-rating anxiety scale (SAS) is a standard for anxiety assessment, which is used to measure the degree of anxiety and its changes in the treatment process. The scale was compiled by William W.K. Zung of Duke University School of Medicine in 1965 and consists of 20 questions. The most important feature of the scale is that it is simple, time-saving, easy to grasp, and can quickly reflect the degree of anxiety that the subjective feeling of the person being measured. The scale has become one of the most commonly used psychometric tools by counsellors, psychologists and psychiatrists, and is also widely used in group surveys of certain specific populations. Cronbach's alpha coefficient of the scale was verified in the study to be 0.897 with good internal consistency.

2.2.2. Attributional Style Questionnaire (ASQ)

Subjects' attributional style was measured by the attributional style questionnaire (ASQ), which was developed by Guo et al. (2003) using a sociometric method. The ASQ is a self-report scale with 10 events, including 5 positive and 5 negative events. It is mainly scored in four aspects, namely, overall index, intrinsicity, persistence, and wholeness, and adopts a five-level scoring method to separate the positive and negative events. According to the nature of the events, the subjects' scores on the three dimensions of positive and negative events were summed and averaged to obtain the overall indicators of positive and negative events. A high score indicates that the individual tends to attribute it to intrinsic (due to his or her own reasons), or enduring (affects for a long time), or holistic (affects other aspects of life). Previous studies have shown that the combined Cronbach's alpha coefficients of the questionnaire's three subscales (control point, stability, and prevalence) are all above 0.6, and are able to effectively measure individual attributional style.

2.2.3. Ruminative Responses Scale (RRS)

The degree of rumination of the subjects was measured by the Rumination Thinking Scale (RRS-CV), revised by Han and Yang (2009). The so-called ruminative thinking refers to the fact that when an individual encounters a negative life event, such as failure in an examination or loss, the individual's thinking stays in the impact of the life event, and he/she keeps thinking about "why did this happen to me" or "if this happens all the time, I won't be able to devote myself to new work", i.e., repeatedly thinking about the causes and consequences of the event and its

effects on him/herself. “The scale consists of 22 items, which are designed to help you understand the impact of life events on your life, and to think about the causes and consequences of the events and how they make you feel. The scale consists of 22 items divided into three factors: symptom rumination, brooding, and reflective pondering. It is rated on a scale of 1 - 4 (1 = never; 2 = sometimes; 3 = often; 4 = always), with higher scores indicating a more severe tendency to ruminate. Cronbach’s alpha coefficients for the factors of the scale ranged from 0.73 - 0.88 in the relevant studies with good internal consistency.

2.3. Statistical Methods

SPSS 26.0 software and Process plug-in were used to perform independent samples t-test, Pearson’s correlation analysis, multiple linear regression analysis, and mediation effect test on the data.

3. Results

3.1. Descriptive Statistics of Anxiety Levels

The anxiety level of the subjects was measured using the SAS scale, and the higher the score, the more pronounced the anxiety tendency. According to the score criteria defined by the SAS scale, the overall anxiety level of the subjects was located in the range of 50 - 59 points, 95 people, accounting for 25.7% of the total, which belongs to mild anxiety; located in the range of 60 - 69 points, 42 people, accounting for 11.4%, which belongs to moderate anxiety; located in the range of 70 points and above, 14 people, accounting for 0.04%, which belongs to severe anxiety. Overall, there are 151 college students whose anxiety level is at mild anxiety and above, accounting for 40.9% of the total number of surveyed students, which shows that anxiety has become a common phenomenon among the surveyed college student groups. See **Table 1** for details.

Table 1. Descriptive statistics for anxiety scores.

	form	quorum	percentage	anxiety level
score band	50 - 59	95	25.7 per cent	mild anxiety
	60 - 69	42	11.4 per cent	moderate anxiety
	70 points and above	14	0.04 per cent	high anxiety

3.2. Comparison of Scores on Each Scale among College Students of Different Genders

A total of 75 male samples and 294 female samples were received for this study. Due to the excessive difference in the number of male and female samples, the data were balanced using random undersampling, i.e., 75 samples were randomly selected from the majority category (female subjects) to equal the number of samples from the male subjects, thus balancing the dataset. The anxiety levels of females were all found to be significantly higher than males through multiple ran-

dom undersampling. See [Table 2](#) for details.

Table 2. Scores on each scale for college students of different genders.

	variant	Male (n = 75)	Female (n = 75)	t-value	p-value
	anxiety score	44.65 ± 11.68	48.1 ± 11.40	-2.32	0.021
Attribution of positive events	intrinsic	3.18 ± 0.99	3.17 ± 0.86	0.14	0.889
	durability	3.86 ± 0.81	3.78 ± 0.74	0.84	0.403
	totality	3.62 ± 0.87	3.43 ± 0.85	1.75	0.081
Attribution of negative events	intrinsic	3 ± 0.77	2.95 ± 0.61	0.72	0.47
	durability	3.47 ± 0.81	3.37 ± 0.72	1.08	0.281
	totality	3.21 ± 0.82	2.99 ± 0.81	2.07	0.039
	Symptomatic ruminants	25.17 ± 9.03	25.35 ± 8.44	-0.16	0.876
chew the cud	reflect upon sth.	11.92 ± 3.55	11.78 ± 3.79	0.30	0.766
	obsession	11.21 ± 3.54	11.15 ± 3.55	0.14	0.89

3.3. Correlation Analysis of Variables

The results of the Pearson correlation analysis show that:

1) **There is a significant negative correlation between the anxiety level of all subjects and the persistence of their attributions to positive events**, i.e., subjects who tend to make persistent attributions to positive events are less likely to be anxious. There was a significant positive correlation between the anxiety levels of all subjects and the intrinsic and holistic nature of their attributions to negative events, i.e., subjects who tended to make intrinsic and holistic attributions to negative events were more likely to develop anxiety. See [Table 3](#) for details.

2) **The correlations between subjects' anxiety levels and other variables were analysed using gender as a grouping variable.** It was found that there was a significant correlation between the intrinsic and persistent nature of the attributions for negative events and the anxiety scores of the female subjects, while no such correlation was found for the male subjects, and that there was no significant difference between the correlations between the other scores and the anxiety scores of the male and female subjects. Thus, it is likely that women's intrinsic and persistent attributions for negative events are responsible for significantly higher levels of anxiety in women than in men. See [Table 4](#) for details.

3.4. Regression Analysis

In this study, persistent attributions to positive events and holistic attributions to negative events were selected as independent variables for three main reasons: first, following [Abramson et al.'s \(1978\)](#) attributional style theory, the two corresponded to the core dimensions of adaptive attributions to positive events and maladaptive attributions to negative events, and were strongly associated with

Table 3. Correlations between variables for all subjects.

		positive event			negative event			chew the cud		
		apprehensive						Symptomatic	reflect	obsession
		intrinsic	durability	totality	intrinsic	durability	totality	ruminants	on sth.	
	apprehensive	1								
positive event	intrinsic	0.068	1							
	durability	-0.125*	0.241**	1						
	totality	0.063	0.25**	0.619**	1					
negative event	intrinsic	0.118*	0.183**	0.104*	0.157**	1				
	durability	0.095	0.120*	0.533**	0.402**	0.196**	1			
	totality	0.276**	0.08	0.283**	0.546**	0.275**	0.571**	1		
chew the cud	Symptomatic ruminants	0.693**	0.015	0.007	0.106*	0.159**	0.294**	0.408**	1	
	reflect on sth.	0.514**	0.029	0.162**	0.223**	0.055	0.355**	0.421**	0.835**	1
	obsession	0.509**	0.048	0.129*	0.190**	0.043	0.262**	0.357**	0.778**	0.799**

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. Same as below.

Table 4. Correlations between anxiety levels and the remaining variables for both sexes.

		Attribution of positive events			Attribution of negative events			chew the cud		
		intrinsic	durability	totality	intrinsic	durability	totality	Symptomatic	reflect	obsession
								ruminants	on sth.	
apprehensive	male	0.046	-0.013*	0.011	0.095	0.055	0.298**	0.699**	0.476**	0.490**
	female	0.077	-0.151**	0.092	0.133*	0.116*	0.291**	0.697**	0.530**	0.519**

anxiety; second, the pre-correlation analysis showed that the former was significantly negatively correlated ($r = -0.125^*$) with anxiety, and the latter was the strongest positively correlated ($r = 0.276^{**}$) with anxiety, and was stable and significant in both male and female groups. Second, the pre-correlation analysis showed that the former was significantly negatively correlated with anxiety ($r = -0.125^*$), and the latter had the strongest positive correlation with anxiety ($r = 0.276^{**}$), and it was stable and significant in both male and female groups; third, the correlation between the two was low ($r = 0.283^{**}$), with the VIF value of 1.087, which could avoid the problem of covariance, and at the same time simplify the model to enhance the clarity of conclusions.

In order to further investigate the effect of attributional style on anxiety, this study conducted multiple linear regression analyses with persistent attributions to positive events and holistic attributions to negative events as the independent variables and anxiety as the dependent variable. The results of the analyses are presented in **Table 5**, The regression model showed that persistent attributions to positive events negatively predicted anxiety ($\beta = -3.375$, $t = -4.318$, $p < 0.001$),

and holistic attributions to negative events positively predicted anxiety ($\beta = 4.79$, $t = 6.623$, $p < 0.001$), and the model's F-value was 25.177, $p < 0.001$, which indicating a significant model. The adjusted R-square was 0.116, indicating that the predictor variables (persistent attributions to positive events and holistic attributions to negative events) had 11.6% explanatory power for the model, and the model fit was good. D-W was 2.003, which can be considered that the model had no autocorrelation, and the model was well constructed. The VIF values were 1.087, both less than 5, indicating that there was no multicollinearity problem among the independent variables.

This suggests that anxiety is more likely to develop for subjects who make persistent attributions to positive events and holistic attributions to negative events, and that holistic attributions to negative events in particular are the strongest predictors of anxiety.

Table 5. Regression analysis.

apprehensive	β	t	significance	tolerances	VIF
(Constant)	45.697	14.269	0.000		
positive and long-lasting	-3.375	-4.318	0.000	0.920	1.087
negative whole	4.789	6.623	0.000	0.920	1.087
F-value	25.177***				
Adjusted R-square	0.116				
D-W	2.003				

3.5. Analysis of Mediating Effects

In order to explore the underlying mechanisms of the effect of attributional styles on anxiety and the reasons for the significant differences in anxiety levels between men and women. Rumination thinking was further introduced in the study as a mediating variable, substituting for structural equation modelling. Model 4 in the SPSS macro program PROCESS was used to test the mediating effect, and the mediating effect of rumination between holistic attributions to negative events and anxiety was estimated by taking 5000 samples to mediate the 95% confidence intervals of the estimated effect, by gender, according to the method of Bootstrap provided by Hayes.

As shown in **Figure 2**, for male subjects, holistic attributions to negative events positively predicted rumination ($\beta = 0.508$, $SE = 1.867$, $p < 0.001$), and rumination positively predicted anxiety ($\beta = 0.665$, $SE = 0.081$, $p < 0.001$), but holistic attributions to negative events did not significantly predict anxiety ($\beta = -0.040$, $SE = 1.497$, $p = 0.701$). The mediating effect Bootstrap 95% confidence interval [0.197, 0.510] for rumination did not contain 0. The mediating effect was 0.298, which accounted for 100% of the total effect, indicating that rumination fully mediated the relationship between holistic attributions to negative events and anxiety. For female subjects, holistic attributions to negative events positively predicted rumi-

nation ($\beta = 0.407$, $SE = 0.981$, $p < 0.001$) and rumination positively predicted anxiety ($\beta = 0.644$, $SE = 0.037$, $p < 0.001$), but holistic attributions to negative events did not significantly predict anxiety ($\beta = 0.029$, $SE = 0.682$, $p = 0.544$), the mediating effect Bootstrap 95% confidence interval [2.542, 4.863] for rumination did not contain 0, and the mediating effect was 0.291, which accounted for 100% of the total effect, suggesting that rumination fully mediates the relationship between holistic attributions to negative events and anxiety. As shown in **Figure 3**.

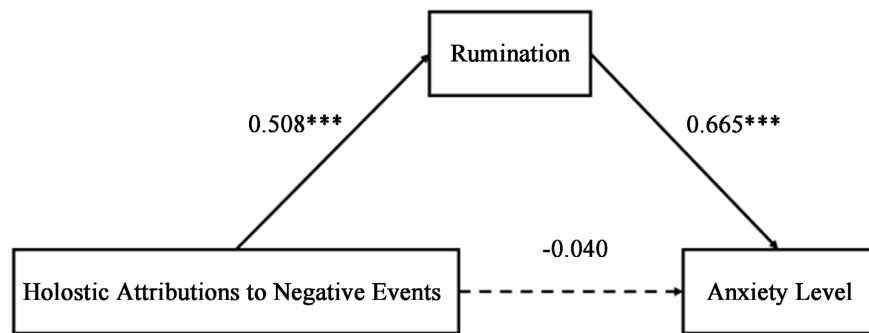


Figure 2. Mediating role of rumination between holistic attributions to negative events and anxiety (males).

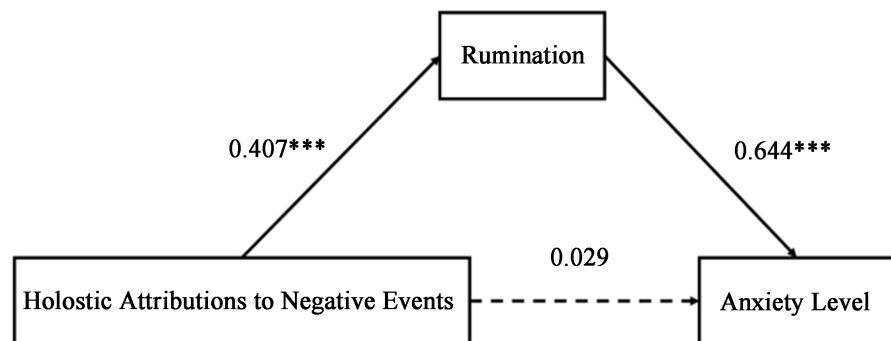


Figure 3. Mediating role of rumination between holistic attributions to negative events and anxiety (females).

In both mediation effect tests, the mediation effect Bootstrap 95% confidence intervals for rumination did not contain 0. The above results indicate that for both males and females, rumination fully mediates the relationship between holistic attributions to negative events and anxiety, with mediation effect values of 4.26 and 4.10 respectively, both accounting for 100% of the total effect, i.e., for both males and females, holistic attributions to negative events are produced by increasing holistic attributions both produced higher levels of anxiety through increased rumination. It is worth noting that for male subjects, the direct effect of overall ratings of negative events on anxiety did not reach statistical significance, but the direction of the effect was positive. For female subjects, the direct effect of overall ratings of negative events on anxiety was also not significant, but its direction of action was negative. Thus, despite the fact that the direct effects of both models were not significant, the direction of the direct effect of men's and women's

holistic ratings of negative events on anxiety showed an opposite trend (one positive and one negative), which may be an important reason for the significant difference between men's and women's anxiety levels. The mediating effects of men and women are analyzed in **Table 6**, **Table 7**.

Table 6. Analysis of male mediated effects.

	efficiency value	se	LLCI	ULCI	effect size
aggregate effect	4.26	1.60	0.01	1.07	
intermediary effect	4.26	0.08	0.20	0.51	100%

Table 7. Female mediated effects analysis.

	efficiency value	se	LLCI	ULCI	effect size
aggregate effect	4.10	0.79	2.55	5.65	
intermediary effect	4.10	0.04	0.18	0.35	100%

Using persistent attributions to positive events as a mediating variable, ruminative thinking and anxiety as independent and dependent variables respectively found that ruminative thinking was not a significant predictor of holistic attributions to negative events, $p = 0.148$; using persistent attributions to positive events as a mediating variable, ruminative thinking and anxiety as independent and dependent variables respectively found that ruminative thinking was a predictive effect was significant with an effect value of 0.025, $p < 0.001$, but holistic attributions to negative events were not significant in predicting anxiety, $p = 0.998$. Therefore, the mediating role of attributional style between rumination thinking and anxiety was not found in this study.

4. Discussion

4.1. Summary of the Study

The present study took 369 college student subjects as a sample, and confirmed the correlation between subjects' anxiety level and their attributional style and rumination thinking through questionnaire research. There was a significant negative correlation between subjects' anxiety level and the persistence of their attributions to positive events, i.e., subjects who tended to make persistent attributions to positive events were less likely to be anxious; and there was a significant positive correlation between subjects' anxiety level and the intrinsicity and wholeness of their attributions to negative events, i.e., subjects who tended to make intrinsic and wholeness attributions to negative events were more likely to be anxious. This result is consistent with Abramson's attributional style theory (Abramson et al., 1978) that individuals are more likely to be anxious or depressed when they tend to attribute negative events to intrinsic, stable, and global factors. In addition, the strong correlation between symptom reversal and anxiety in rumination confirms Nolen-Hoeksema's (1991) view that repeated focus on negative emotions and

their consequences can exacerbate psychological distress, creating a vicious cycle of “rumination-anxiety”.

The regression model ($R^2 = 0.506$) showed that symptom rumination, introspection, and negative persistent attributions had a joint explanatory power of 50.6% for anxiety, suggesting that rumination and negative cognitions are core drivers of anxiety. This echoes Watkins' (2008) theory of adaptive-non-adaptive rumination: non-adaptive rumination (e.g., symptomatic rumination) exacerbates anxiety by reinforcing negative cognitions, while adaptive rumination (e.g., introspective rumination) may alleviate emotions through problem solving, but both were positively correlated with anxiety in the present study, possibly due to the fact that general lack of effective coping strategies in the college population.

The study also found that the surveyed female university students had significantly higher levels of anxiety than their male counterparts. The present study analysed the correlations using gender as a grouping variable and found that there was a significant correlation between intrinsic and persistent attributions for negative events and their anxiety scores for female subjects, while no such correlation was found for male subjects and there was no significant difference between the correlations between other scores and anxiety scores for males and females. Thus, it is likely that women's intrinsic and persistent attributions for negative events are responsible for women's significantly higher levels of anxiety than those of men. This finding can be further explained from a socio-cultural perspective: women are more susceptible to social role expectations and interpersonal pressures (McLean & Anderson, 2009), which may amplify the impact of negative events through “over-responsibilising” attributional patterns (Rudolph, 2002), and therefore exacerbate internalised mental distress.

4.2. Innovations in This Study

Compared with existing studies that mostly focus on clinical anxiety or depression (e.g., Kessler et al., 2005), the present study focuses on the daily emotional distress of ordinary college students, revealing the micro-mechanisms of intrapsychic depletion - the interaction between attributional bias and non-adaptive rumination. Methodologically, the integration of ASQ, RRS-CV and SAS scales to multidimensionally assess the relationship between cognition and emotion provides a replicable analytical framework for subsequent studies. On the practical level, this study provides new directions for psychological interventions in higher education: modifying negative attributional patterns through cognitive behavioural therapy (CBT) (Beck, 2011), or designing “positive rumination training” to guide individuals to transform repetitive thoughts into problem-solving behaviours (Treyner et al., 2003), or effectively blocking the cognitive chain of anxiety.

Based on this, the present study provides new ideas for mental health interventions in higher education, suggesting blocking rumination or improving negative cognitions, targeting the development of training methods based on positive rumination, and guiding students to make positive attributions, among others.

4.3. Limitations and Prospects

The present study has the following limitations: first, the cross-sectional design is difficult to determine the causal relationship between variables, and in the future, longitudinal tracking or experimental intervention methods can be used to verify the dynamic effects of attributional styles and rumination on anxiety; second, the sample is concentrated in a single university and the proportion of females is too high (79.7%), which may limit the generalisability of the conclusions, and the follow-up needs to expand the geographic and institutional coverage, and to balance the gender ratio; third, there are too many questions on the scale administration. The number of questions in the scale administration is too much, too many questions in the scale may affect the cooperation of the subjects, therefore, we should try to choose the same type of scale with less questions in the scale selection; fourth, the sample of subjects mostly comes from the same university, therefore, the sampling of subjects will inevitably have some homogeneous effects. Sampling for future studies should try to balance schools and cities to ensure the diversity of subjects and the representativeness of the sample.

In future research, the mediating role of rumination can be further explored, e.g., whether negative attributions indirectly affect anxiety through rumination. And the influence of cultural differences on attribution patterns can be explored, such as whether individuals prefer holistic attributions in a collectivist context. In terms of ruminative thinking interventions, the development of targeted intervention programmes, such as the mobile-based Positive Thinking Training Program (Flett et al., 2019), could be further explored to validate their mitigating effect on college students' anxiety.

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Conflicts of Interest

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