

The Effect of Cognitive Avoidance on Rumination in College Students: The Chain mediating role of Perfectionism and Stress

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Abstract Objective: To study the chain mediating effect of perfectionism and stress on cognitive avoidance and rumination. Methods: A total of 5412 college students were surveyed by Cognitive Avoidance Scale, Perfectionism Scale, Stress Scale and Rumination Scale. Results :(1) correlation analysis showed that there were significant positive correlations among cognitive avoidance, perfectionism, stress and rumination ($r = 0.324-0.484, P < 0.001$); (2) Cognitive avoidance had a significant positive effect on rumination ($t = 0.347, P < 0.001$), (3)perfectionism partially mediated the relationship between cognitive avoidance and rumination($[0.1096,0.1429], P < 0.001$), pressure partially mediated the relationship between cognitive avoidance and rumination ($[0.0584, 0.0878], P < 0.001$), perfectionism and stress played a significant role in the chain mediation between cognitive avoidance and rumination ($[0.0034,0.0070], P < 0.001$). Conclusion: Cognitive avoidance can directly affect rumination and indirectly affect rumination through the chain mediating effect of perfectionism and stress. This study reveals the relationship between cognitive avoidance and rumination and its mechanism.

Key words Cognitive Avoidance, Perfectionism, Stress, Rumination, Chain Mediation

1 Introduction

Individuals frequently encounter adverse life events, such as disappointments, academic failures, emotional distress, and occupational setbacks. They often engage in prolonged reflection on the causes, processes, and outcomes of these events, unable to extricate themselves from this cycle. This repetitive thinking pattern amplifies negative emotions and cognitive biases, potentially leading to more severe mental health issues, including depression (Magnus et al., 2018). Scholars like Nolen-Hoeksema have termed this phenomenon "rumination." In her research on depression, Nolen-Hoeksema introduced the concept of rumination, which refers to the passive

and repetitive focus on one's negative emotions and their causes, consequences, and effects (Nolen-Hoeksema, 1991). Studies have demonstrated a strong association between negative rumination and various mental disorders, including depression, anxiety, bipolar disorder, and post-traumatic stress disorder (Constantin et al., 2018; Kertz et al., 2019; Mihailova et al., 2020). However, rumination is not exclusively detrimental. Johnson and McKenzie et al. found that while individuals with depression and bipolar disorder exhibit higher levels of negative rumination, those with bipolar disorder also display a tendency towards positive rumination (Johnson et al., 2008). Feldman et al. further explored the concept of positive rumination. Chinese scholar Wang Zhong developed the Rumination Thinking Scale for Chinese college students (Wang Zhong, 2016), which encompasses both positive and negative aspects of Rumination.

Most domestic and foreign studies have focused on the impact of rumination on individuals, while there is relatively less research on what causes individuals to engage in rumination. Not all people will fall into a state of thinking or deep processing when encountering some negative and unwanted experiences such as physical sensations, thoughts, memories, and emotions. Some individuals will adopt avoidance strategies, such as experiential avoidance and cognitive avoidance. Research has found that experiential avoidance can positively predict rumination (Yang et al., 2021). In daily life, intrusive images or thoughts that flash through people's minds are intentionally or unintentionally controlled and avoided to prevent them from disturbing ongoing activities, such as thought suppression, distraction, and thought substitution (Behar et al., 2009). This phenomenon is called cognitive avoidance. Therefore, this study proposes Hypothesis H1: Cognitive avoidance is closely related to Rumination and positively predicts Rumination.

Research has found that perfectionism can positively predict rumination, and the higher an individual's perfectionism, the deeper the degree of rumination (Chen Honghua et al., 2022; Flett et al., 2016). Zhang Dan et al. found that college students' stress can positively predict their rumination and indirectly predict sleep quality through rumination (Zhang Dan et al., 2021). Xie Xiaolong's research found that perfectionism among enterprise employees positively affects work stress and indirectly affects work addiction through work stress (Xie Xiaolong, 2021). In daily life, people consciously or unconsciously avoid some intrusive thoughts or images to maintain what they are doing, which is also a manifestation of perfectionism, representing a personality trait that pursues perfection (Chen Hongyan et al., 2015). Therefore, this study proposes research

hypothesis H2: Perfectionism and stress play a chain mediating role between cognitive avoidance and rumination. The hypothetical model diagram is as follows:

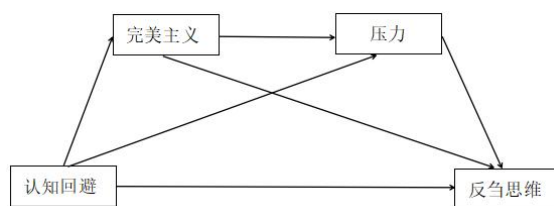


Figure 1 Research hypothesis model diagram

2 Research Method

2.1 Subjects

A questionnaire survey was conducted among students from four universities in Xinjiang, Henan and Guangdong with convenient sampling. A total of 6000 questionnaires were sent out and 5412 valid questionnaires were collected, with an effective rate of 90.20%. Among them, the mean age was 19.89 (standard deviation was 2.08); There were 2803 boys (51.79%) and 2609 girls (48.21%). There are 2,060 college students from rural areas (38.06%), 1,052 from towns and villages (19.44%), and 2,300 from cities (42.50%).

2.2 Instrument

2.2.1 Cognitive Avoidance Questionnaire

Jiao Keyuan et al. (2017) introduced and revised the Cognitive Avoidance Questionnaire (CAQ) studied by foreign scholars (Jiao Keyuan et al., 2017). The questionnaire consisted of 5 factors and 25 items, the five factors were thought suppression, thought substitution, attention diversion, avoidance of dangerous stimuli, image thinking, etc. The 5-point Likert scoring method was adopted, ranging from "completely atypical" to "completely typical", and the score was 1-5 points. The reliability and validity of the questionnaire were verified by Jiao Keyuan et al. The Klunbach α coefficient of the total scale was 0.930, and the Klunbach α coefficient of each subscale was between 0.732 and 0.839. The Klunbach α coefficient of internal consistency of the questionnaire in this test is 0.952, which indicates good reliability and can be further analyzed.

2.2.2 Rumination Scale

The rumination thinking scale of college students compiled by Wang Zhong was adopted (Wang Zhong, 2016). The scale contains a total of 23 items in two dimensions of positive

rumination thinking and negative rumination thinking. Likert four-point scoring method is used to calculate 1-4 points from "never" to "always", and the internal consistency coefficient is 0.740. The Klonbach α coefficient of internal consistency in this survey is 0.799, which indicates good reliability and can be further analyzed.

2.2.3 Perfectionism Scale

The Positive and Negative Perfectionism Scale (PANPS) compiled by Terry-Short et al. (1995), translated and revised by Zhou Xueting, was adopted (Zhou Xueting, 2012). The revised scale contains 25 items, divided into two dimensions of positive perfectionism and negative perfect attention. Likert five-point scoring method of 1 (very inconsistent) to 5 (very consistent) is adopted. The higher the average score of dimensions, the more obvious the positive or negative perfectionism tendency is. The internal consistency coefficient of the scale was 0.84. The Klonbach α coefficient of internal consistency of the scale in this survey is 0.916, which indicates good reliability and can be further analyzed.

2.2.4 Stress Scale

Using the simplified Chinese version of the 21-Item Depression Anxiety and Stress Scale (DASS-21) (Lu Shan et al., 2020; Gong Xu et al., 2010). The pressure subscale uses the Liket four-point scoring system, from "not conforming" to "most conforming", with a score of 0 to 3. The Klonbach coefficient of internal consistency of this scale is 0.861, which indicates good reliability and can be further analyzed.

2.3 Statistical Analysis

SPSS19.0 was used for correlation analysis and regression analysis of the data, and PROCESS plug-in was used to test the mediating effect and its effect size with bias corrected percentile bootstrap CI method.

2.4 Common method deviation test

In order to control the quality of research data and prevent the occurrence of common method bias effect, this study strictly controlled the data investigation procedures, selected standardized scales with high reliability and validity and good recognition, ensured the standardized and orderly testing procedures as much as possible, adopted anonymous responses and set reverse scoring items. In statistical analysis, Harman single factor method was used to analyze all scale questions.

The results without factor rotation showed that there were 12 factors with feature roots greater than 1, among which the variance explained by the first factor was 17.89% of the variance, which was less than the critical value of 40%, indicating that there was no significant common method bias in the data of this study.

3 Research Finding

3.1 correlation analysis

The relationship between cognitive avoidance, rumination thinking, perfectionism and stress among college students was examined and analyzed by using the Person product difference correlation method. The results showed that cognitive avoidance was significantly positively correlated with rumination ($r=0.347$, $P<0.001$), perfectionism ($r=0.324$, $P<0.001$), and stress ($r=0.484$, $P<0.001$). Rumination was positively correlated with perfectionism ($r=0.471$, $P<0.001$) and stress ($r=0.324$, $P<0.001$). However, the positive perfectionism dimension of perfectionism was not significantly related to the thought substitution dimension of cognitive avoidance ($P>0.05$), and was not significantly related to stress ($P>0.05$). Specific results are shown in Table 1:

Table 1 Correlation matrix of cognitive avoidance, rumination, perfectionism and stress

	1	2	3	4	5	6	7	8	9	10	11
1.Thought substitution	1										
2.Image thinking	0.704***	1									
3.Shift attention	0.649***	0.717***	1								
4.Avoidance of dangerous stimuli	0.689***	0.724***	0.755***	1							
5.Thought suppression	0.600***	0.659***	0.718***	0.764***	1						
6.Cognitive avoidance	0.826***	0.873***	0.885***	0.907***	0.862***	1					
7.Rumination	0.278***	0.331***	0.301***	0.307***	0.292***	0.347***	1				
8.Positive perfectionism	0.005	0.143***	0.168***	0.138***	0.147***	0.142***	0.393***	1			
9.Negative perfectionism	0.373***	0.380***	0.367***	0.402***	0.383***	0.437***	0.418***	0.478***	1		
10.Perfectionism	0.204***	0.295***	0.303***	0.303***	0.298***	0.324***	0.471***	0.868***	0.845***	1	
11.Stress	0.465***	0.415***	0.375***	0.447***	0.416***	0.484***	0.324***	-0.003	0.455***	0.244***	1

Infuse: *P<0.05, **P<0.01, *P<0.001. (the same below)**

3.2 Mediation analysis

The procedure for testing the mediating effect proposed by Wen Zhonglin et al. (Wen Zhonglin, Ye Baojuan, 2014) is adopted. Before testing, all variables are converted into standard Z-scores. After controlling for age and gender, we first examined the predictive effects of cognitive avoidance, perfectionism and stress on rumination thinking using cognitive avoidance, perfectionism and stress as independent variables and rumination thinking as dependent variables. The results showed that (see Table 2) : cognitive avoidance had a significant positive impact on rumination thinking ($t=0.347$, $P<0.001$), perfectionism had a significant positive impact on rumination thinking ($t=0.403$, $P<0.001$), and stress had a significant positive impact on rumination thinking ($t=0.158$, $P<0.001$).

Table 2 Regression analysis with rumination as the result variable

Variable	First step		Second step		Third step		Fourth step	
	β	t	β	t	β	t	β	t
Age	0.000	0.012	-0.012	-0.961	0.021	1.808	0.012	1.047
Gender	-0.023	-1.662	-0.028	-2.192*	-0.036	-3.106*	-0.033	-2.852**
Cognitive avoidance			0.347	27.236***	0.216	17.460***	0.145	10.661***
Perfectionism					0.403	32.587***	0.387	31.487***
Stress							0.158	11.904***
R^2	0.001		0.121		0.265		0.283	
F	1.381		248.315***		488.257***		429.111***	

Secondly, we examined the predictive effects of cognitive avoidance and perfectionism on stress. The results showed that (see Table 3) : cognitive avoidance had a significant positive impact on stress ($t=0.483$, $P<0.001$), and perfectionism had a significant positive impact on stress ($t=0.103$, $P<0.001$). So far, perfectionism not only directly affects rumination thinking, but also indirectly affects rumination thinking through pressure, that is, pressure plays a partial mediating role between perfectionism and rumination thinking. In combination with Table 2, we find that cognitive avoidance not only directly affects rumination thinking, but also indirectly affects rumination thinking through stress, indicating that stress plays a partial mediating role between cognitive avoidance and rumination thinking.

Table 3 Regression analysis with pressure as the result variable

Variable	First step		Second step		第三步	
	β	t	β	t	β	t
Age	0.066	4.869	0.049	4.106***	0.057	4.833***
Gender	-0.012	-0.877	-0.019	-1.629	-0.021	-1.817
Cognitive avoidance			0.483	40.643***	0.449	35.945***
Perfectionism					0.103	8.196***
R^2	0.004		0.237		0.245	
F	12.297***		561.307***		442.925***	

Finally, we examine the predictive effect of cognitive avoidance on perfectionism. The results showed (see Table 4) that cognitive avoidance had a significant positive effect on perfectionism ($t=0.327$, $P<0.001$). Based on Table 3, it is found that cognitive avoidance not only directly affects stress, but also indirectly affects stress through perfectionism, that is, perfectionism mediates the relationship between cognitive avoidance and stress. In combination with Table 2, it is found that cognitive avoidance not only directly affects rumination thinking, but also indirectly affects rumination thinking through perfectionism. The mediation model is shown in Figure 2:

Table 4 Regression analysis with perfectionism as the result variable

Variable	第一步		第二步	
	β	t	β	t
Age	-0.071	-5.252***	-0.083	-6.468***
Gender	0.026	1.886	0.021	1.602
Cognitive avoidance			0.327	25.516***
R^2	0.005		0.112	
F	15.702***		228.740***	

3.3 Intermediate effect test

Cognitive avoidance was taken as the predictive variable, perfectionism and stress as the mediating variable, and rumination thinking as the dependent variable. A bias corrected percentile boot-strap CI method was used to repeat the sample 5000 times. A 95% confidence interval was calculated to analyze the mediating effect. The results showed that perfectionism and stress had a significant chain mediating effect (confidence interval did not contain 0, [0.0034,0.0070], $P<0.001$), which further proved that perfectionism and stress had a chain mediating effect between

cognitive avoidance and rumination. The direct effect of cognitive avoidance on rumination accounted for 41.65%, the indirect effect of cognitive avoidance through perfectionism and pressure accounted for 58.35%, the intermediary effect of perfectionism accounted for 36.03% of the indirect effect, the intermediary effect of pressure accounted for 20.88%, and the chain intermediary effect of perfectionism and pressure accounted for 1.44%. The specific mediating effects and paths are shown in Table 5:

Table 5 Mediating effect path and effect size of perfectionism and stress

effect	path relationship	95%fiducial interval	effect size	size of effect
direct effect	Cognitive avoidance→Rumination	[0.1178, 0.1710]	0.1444	41.65%
indirect effect	Cognitive avoidance→Perfectionism→Rumination	[0.1096, 0.1429]	0.1249	36.03%
	Cognitive avoidance→Stress→Rumination	[0.0584, 0.0878]	0.0724	20.88%
	Cognitive avoidance→Perfectionism→Stress→Rumination	[0.0034, 0.0070]	0.0050	1.44%
	Total mediating effect		0.2023	58.35%
total effect			0.3467	100%

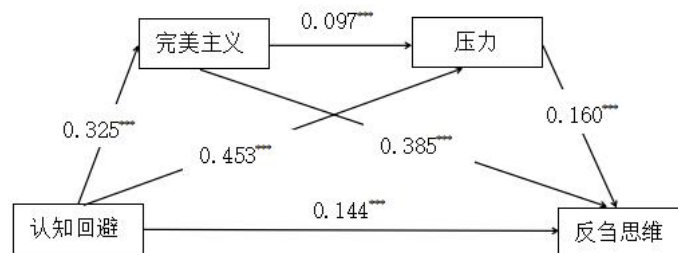


Figure 2. The chain mediation model of perfectionism and stress

4 Discussion

Cognitive avoidance is an important predictor of rumination. The study found that cognitive avoidance positively affects rumination thinking, that is, the higher the degree of cognitive

avoidance, the higher the degree of rumination thinking. The research hypothesis H1 is verified. Yang Hong et al. found that clinical nurses' experiential avoidance was significantly positively correlated with rumination thinking, and regression analysis found that clinical nurses' experiential avoidance had a significant positive predictive effect on rumination thinking (Yang Hong et al., 2021). Both experiential avoidance and cognitive avoidance emphasize the avoidance of negative events or thoughts in the current work, such as thought suppression, etc., but the difference is that experiential avoidance is relatively broad, such as avoidance, avoidance or modification of some things, including thinking, emotion, memory and de-body feeling, etc. (Hayes et al., 1996), while cognitive avoidance is more specific. Strong operability (Shen Sali, 2021), such as intentionally or unintentionally avoiding some intrusive thoughts or pictures, such as thinking repression, attention shifting, thinking substitution, etc. This study shows that cognitive avoidance is positively correlated with rumination thinking and can positively affect rumination thinking. College students intentionally or unintentionally avoid intrusive thoughts or images that affect their ongoing activities in order to reduce the impact of these negative information or thoughts, but inevitably process these negative information, resulting in ruminative thinking.

It was found that cognitive avoidance affected rumination through the mediating effect of perfectionism, accounting for 36.03%. The cognition of college students when they avoid some intrusive thoughts or pictures is a manifestation of pursuing the perfection of current activities, and individuals with high perfectionism tendency have higher rumination thinking (Gan Xiaorong et al., 2017; Chen Hong-hua et al., 2022).

It was found that cognitive avoidance affected rumination through the mediating effect of stress, and the mediating effect accounted for 20.88%. This suggests that stress is an important factor in understanding the effects of cognitive avoidance on rumination. Individuals' control of intrusive thinking will enhance their perception of pressure, and thus trigger rumination thinking (Zhang Dan et al., 2021), which also validates the stress response model of rumination thinking, that is, individuals will have a specific tendency to rumination thinking in the face of pressure (Robinson et al., 2003).

The study further found that perfectionism and stress play a chain mediating role between cognitive avoidance and rumination thinking, and the research hypothesis H2 was verified.

Cognitive avoidance not only affects rumination directly, but also indirectly through the chain mediation of perfectionism and stress. Perfectionism tends to occur when individuals control intrusive thinking, and high perfectionists tend to perceive higher work pressure (Xie Xiaolong, 2021), which leads to more rumination thinking. This result also indicates that when college students cannot effectively eliminate the influence of cognitive avoidance on rumination thinking, they can consider reducing their pursuit of perfection and relieving pressure to reduce rumination thinking and avoid the negative physiological and psychological effects of rumination thinking (Huang Yunzhen et al., 2019; Zhang Kuo et al., 2021; Guo Sulan, Wu Xinchun, 2011; Zhong Yunhui et al., 2015).

This study further reveals the mechanism of cognitive avoidance on rumination of college students, which has important theoretical significance and practical value for reducing the level of rumination of college students and improving their positive psychological quality. The mental health education department in colleges and universities can adjust the perfectionism of college students and relieve the pressure of work and study, reduce the bad rumination tendency of college students and improve the psychological quality of college students.

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