

Research Article

The Influence of Stress Perception on Academic Procrastination in Postgraduate Students: The Role of Self-Efficacy for Self-Regulated Learning and Self-Control

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Academic procrastination is a common problem among current master's degree students in their research activities and is an important factor that hinders academic progress. Based on the cognitive theory perspective, this study conducted a web-based questionnaire survey on full-time master's students enrolled in a teacher training university in southwest China. The data collected were analyzed by using SPSS software with hierarchical regression and PROCESS macroprogramming techniques to investigate the relationship between stress perception and academic procrastination and the moderating effects of self-regulated learning efficacy and self-control among master's students. The study showed that stress perception was a significant positive predictor of academic procrastination, and both self-regulated learning efficacy and self-control played a moderating role in the relationship between stress perception and academic procrastination. The study suggests that, firstly, to stimulate the personal potential of graduate students with reasonable perception of stress; secondly, to enhance the action ability of graduate students by strengthening metacognitive strategies; finally, to establish a two-way promotion mechanism by enhancing self-regulation and impulse control.

1. Introduction

Postgraduate education is based on cultivating high-level innovative talents, serving the national development strategy, and has made significant contributions to promoting scientific and technological progress and innovation [1]. In recent years, the scale of enrollment in colleges and universities has continued to expand. With the gradual increase in the number of postgraduates, the problems existing in higher education have become increasingly prominent. For example, studies have shown that academic procrastination is common among current graduate students [2]. Academic procrastination not only leads to a decline in the completion of postgraduate study tasks and affects their academic achievement but also the experience of procrastination is often accompanied by negative emotional experiences such as self-doubt, anxiety, guilt, and depression, which have a negative impact on the mental health of postgraduates. Pre-

vious Chinese and foreign studies on academic procrastination have mainly focused on secondary school and university students, with little attention paid to master's degree students' procrastination [3]. However, multiple surveys have found that postgraduate students procrastinate more significantly than undergraduates [4]. In fact, compared with undergraduates, there are more factors affecting graduate students' academic procrastination, and the situation is more complex, mainly reflected in the task characteristics of the two, the external learning environment, and self-efficacy and time management ability and self-efficacy caused by changes in tasks and environments. There are differences in coordination ability and so on. Postgraduates, as modern high-level talents and successors of scientific research, get rid of academic delays, which means improving learning efficiency and improving academic quality. Therefore, exploring the factors and internal mechanisms that influence graduate students' academic procrastination is of

great relevance to effectively prevent and intervene in their academic procrastination.

2. Literature Review

2.1. Prior Research. Previous studies have shown a strong link between academic procrastination and stress perception. Flett et al. found that procrastination was significantly positively correlated with negative events in life through a survey of college students [5]. Tice and Baumeister tracked the procrastination and stress perception of procrastinators throughout the semester and found that procrastinators had higher total stress perception than nonprocrastinators [6]. Chinese scholar Zheng's research shows that individuals with higher stress perception are more sensitive to stress, and their procrastination behavior is more serious [7]. It can be seen that although the view that academic procrastination is the product of high pressure has been recognized by some scholars, the relationship between stress perception and academic procrastination, and "how and when" stress perception affects procrastination still need to be further explored [8]. Some researchers believe that procrastination may be the result of a combination of factors, and the relationship between stress perception and academic procrastination may be affected by multiple factors [9]. Although current researchers have discussed the generation and development mechanism of academic procrastination from different perspectives such as students' learning motivation [10], self-management [11], cognitive factors [12], and personality traits [13], most of them only analyzed the relationship between procrastination and some variables, ignoring the role of moderator variables.

Cognitive theory believes that an individual's internal driving force will prompt the individual to generate learning motivation [14]. When the pressure and motivation interact with academic procrastination, if the individual's internal motivation is greater than the pressure, the positive learning motivation will weaken the negative effect of the pressure, and the individual will not easily produce academic procrastination. Therefore, although an individual's academic procrastination may be affected by self-perception of stress, whether or not to choose to procrastinate academically depends on how an individual processes the stress-perceived information he received, and the evaluation and use of stress-perceived information are the same as the individual's ability to self-control is closely related. In addition, some studies have found that self-efficacy for self-regulated learning is related to individual self-regulation ability and academic efficacy. Students with high self-efficacy for self-regulated learning tend to take positive coping methods when faced with heavy academic tasks [15]. In general, self-control and self-efficacy for self-regulated learning, as important internal driving forces of individuals, may moderate the relationship between stress perception and academic procrastination in postgraduate students, thereby reducing the predictive effect of stress perception on academic procrastination. Therefore, based on the shortcomings of existing research, this study will examine the moderating effects of volitional factors (self-control) and self-regulation factors

(self-regulation learning efficacy) between stress perception and academic procrastination and analyze the effect of stress perception on academic procrastination. Influence mechanism, in order to deepen the existing research on academic procrastination, expands the research scope of procrastination behavior and provides reference and reference for effectively improving the academic procrastination behavior of postgraduates.

2.2. Definition of Core Concepts. Procrastination is common in daily life, study, and work, and procrastination in learning situations is called academic procrastination. Solomon et al. believe that academic procrastination is the behavior of individuals who choose to show voluntary delay in learning tasks that need to be completed within the expected time even when they know that delay will have adverse consequences [16]. Lay and Schouwenburg defines academic procrastination as the emotional discomfort experienced by individuals delaying in starting a task that must be completed [17]. Combined with the actual situation of postgraduate academic tasks, this study defines academic procrastination as the cognitive and the behavior of delaying academic responsibility due to adverse reactions such as emotion and will, which is often accompanied by guilt, anxiety, depression, and other negative emotions [18].

Stress perception refers to the degree to which an individual perceives external events as stress and reflects the individual's interpretation and perception of stressful events [19], often manifested as tension and loss of control. The individual evaluates and constructs the meaning of the external stimulus event, so that the stimulus event transcends its own function and becomes a combination of the event and the individual's feelings [20]. This shows that stress is not only caused by external events but also includes the additional meaning of individuals built on the event [21]. The relationship between college students' stress perception, self-differentiation, social avoidance and distress, and its intervention research, the individual's different internal cognition of stressful events leads to different effects of stressful events on individuals.

Self-efficacy for self-regulated learning is a combined concept based on Bandura's "self-regulation" and "efficacy" proposed by Zimmerman et al. [22] which refers to individuals who can actively use learning strategies, self-examination, beliefs in the ability to self-adjust, resist temptation, complete homework, and participate in classroom learning when needed and reflects an individual's ability to resist distractions, complete schoolwork, and participate in project learning in academics [23]. Self-regulation learning efficacy integrates cognitive and motivational self-regulation mechanisms, not only endows the self-regulation mechanism with the function of monitoring cognition but also integrates social and motivational learning strategies into cognitive strategies [24], which reflects the prospective belief of individuals' ability to deal with future events.

Self-control is an important part of people's self-awareness. It is an individual's active mastery of his own psychology and behavior by consciously choosing goals without external supervision, including suppressing impulses, resisting

temptation, delaying gratification, and controlling and regulating one's own emotions. A comprehensive ability to ensure the realization of goals was obtained [25]. The fundamental point of self-control lies in the individual's conscious and conscious choice when faced with choice and the conscious and conscious control after the choice [26]. Self-control usually includes two kinds of abilities, namely, the individual's ability to meet social expectations through self-regulation and the individual's ability to inhibit impulsive psychology and behavior [27].

3. Research Hypothesis

3.1. The Relationship between Stress Perception and Academic Procrastination. In recent years, with the expansion of postgraduate enrollment and the high requirements of the society for the quality of postgraduates, postgraduates are facing increasing pressures on their studies, graduation, and employment. Research by Helmke and Aken has shown that students with high levels of academic stress tend to avoid critical learning situations and show less effort and more abandonment in school [28]. Fen et al. also believe that when people face high pressure and high demands, they often fail to respond in time, which leads to procrastination. Chinese scholars Fen and others conducted a survey on graduate students and found that stress perception can significantly and positively predict academic procrastination [29]. Previous studies have shown that individuals with high stress perception are more likely to experience academic procrastination. Therefore, this study proposes hypothesis H1: stress perception has a positive predictive effect on academic procrastination.

3.2. The Moderating Effect of Self-Efficacy for Self-Regulated Learning. Studies have shown that self-efficacy for self-regulated learning can affect academic achievement. Scholars such as Klassen et al. began to study the effect of self-regulation learning efficacy on learning procrastination since 2008 and found that self-regulation learning efficacy can significantly predict students' learning procrastination behavior [30]; Wang et al. used a group counseling format to intervene in college students' self-regulated learning efficacy and found that increasing individuals' self-regulated learning efficacy reduced their procrastination behaviors and poor academic outcomes [31]. Jia Silei took postgraduates as the survey object, and the results also proved that there is a significant negative correlation between postgraduate academic procrastination and self-regulation learning efficacy. Therefore, although stress perception may affect the academic procrastination of postgraduate students, the magnitude of this effect may also vary from person to person. For individuals with different self-regulated learning efficacies, the impact of stress perception on academic procrastination may have the difference. Individuals with high self-regulation learning efficacy not only have the ability to self-regulate but also believe that they have the ability to successfully complete tasks. Under the condition of perceived pressure, compared with individuals with low self-regulation learning efficacy, self-regulation learning efficacy

level was shown. Because individuals with high levels have a strong sense of belief that they can resist temptation, they are more inclined to stick to their beliefs and resist temptation when confronted with external pressures. They can effectively adjust their behavior by using learning methods or strategies to avoid procrastination occur. Therefore, this study proposes hypothesis H2: self-regulated learning efficacy has a moderating effect between stress perception and academic procrastination.

3.3. The Moderating Effect of Self-Control. The theory of self-control states that individuals with high levels of self-control are more likely to be influenced by external standards, show better delayed gratification behaviors in various external situations, and try to avoid behaviors that are detrimental to their own interests and have a more positive attitude, while individuals with low self-control are more susceptible to the influence of automatic attitudes and are prone to impulsive behaviors, cognitive biases, and inability to control their own behavior when encountering various external situations, which in turn induces many bad behaviors. The occurrence of behaviors and deviant behaviors, such as academic procrastination, were observed [32]. Therefore, this study suggests that self-control may play a moderating role in the relationship between stress perception and academic procrastination in postgraduate students. Individuals with a high level of stress perception will prompt him to avoid pain and give up efforts when exposed to external temptations, but the individual's own external standards will limit his tendency to instant gratification and control his behavior to avoid procrastination. Time self-control plays a regulatory role in this conflict process. For students with high levels of self-control, they are influenced by personal standards and tend to have more ability to control their behavior, can turn their attention from stress to other activities, and adopt behaviors that adapt to the current situation, thereby effectively avoiding procrastination occurring; students with low self-control levels are more likely to choose instant gratification and procrastinate when faced with temptation because they cannot regulate their impulses and behaviors well, and they cannot adjust their thinking, emotions, and behaviors in time. Based on this, this study proposes hypothesis H3: self-control plays a moderating role in the relationship between stress perception and academic procrastination of postgraduates, that is, the positive relationship between stress perception and academic procrastination of postgraduates with low self-control compared with high self-control stronger predictive effect.

To sum up, this study mainly explores the effect of stress perception on academic procrastination and, on this basis, examines the moderating role of self-regulating learning efficacy and self-control, in order to reveal the process of stress perception affecting academic procrastination and the conditions under which it plays a role. The hypothetical model of the relationship of each variable is shown in Figure 1.

4. Study Design

4.1. Participants. In this study, we tested our hypotheses using self-reported data collected from master's students at

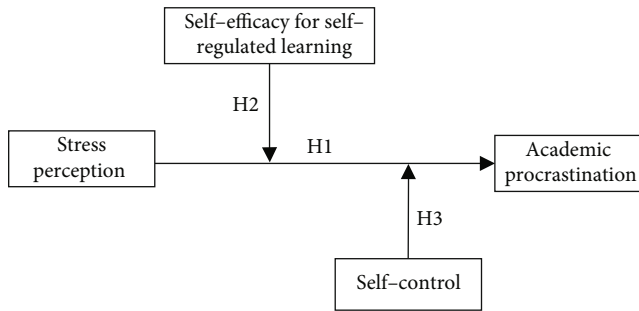


FIGURE 1: Conceptual map of the relationship between stress perception and academic procrastination and the moderating effect.

a university in southwestern China. Using a random sampling technique, faculty and classmates at this university were recruited to forward our online survey, and a total of 312 surveys were returned. After removing the 31 surveys with very short response times, the remaining 281 surveys were used as the basis for data analysis. The survey collected demographic information and items to capture variables of interest. Participants were given a two-week period to take the survey. Of those surveyed, 99 (35%) were male and 182 (65%) were female. First year graduate students accounted for 35% (99), second year graduate students accounted for 46% (129), and third year graduate students accounted for 19% (53). The above data indicate that this sample is representative in terms of gender and grade level.

4.2. Measurement Tools

4.2.1. Academic Procrastination Questionnaire. In this study, the academic tasks of master's degree students were categorized into four items: writing term papers or assignments, publishing papers or research reports, reading academic literature, and tasks assigned by instructors, and were investigated in three dimensions: tendency to procrastinate, the degree of being troubled by the delay, and intention to reduce procrastination. A five-point Likert scale was used, with 1 being "not at all" and 5 being "completely." The Cronbach alpha coefficient of the scale was 0.942, and the Cronbach alpha coefficients of each subdimension were 0.86, 0.88, and 0.91, indicating that the scale has good reliability.

4.2.2. Stress Perception Questionnaire. The measurement of stress perception of master's students was based on the Perceived Stress Scale revised by Tingzhong Yang and Hanteng Huang, which measured two dimensions, tension, and loss of control, with a total of 14 items on a 5-point scale, with higher scores indicating higher levels of stress perception. Previous studies have shown that the scale has good reliability [8], and in this study, the Cronbach alpha coefficient of the scale was 0.82, and the Cronbach alpha coefficients of each subdimension were 0.83 and 0.76 in turn, indicating that the reliability of the scale met the standard.

4.2.3. Self-Efficacy for Self-Regulated Learning Questionnaire. In this study, the Self-Efficacy for Self-Regulated Learning Scale, revised by Wang Qiu et al. in 2015, was used to test

the self-regulated learning efficacy of master's students. The scale consists of 11 questions and is scored on a 7-point scale, with higher scores indicating higher self-regulated learning efficacy of students. The internal consistency coefficient of this questionnaire in this study, Cronbach α , was 0.79.

4.2.4. Self-Control Questionnaire. In this study, we used Morean's revised "Simple Self-Control Scale" to measure the self-control level of master's students in two dimensions: self-regulation and impulse control, with 7 items [33]. The scale was rated on a 5-point Likert scale, ranging from "not at all" to "fully," with items 2, 4, 6, and 7 being reverse scoring questions, with higher scores indicating higher levels of self-control. The Cronbach alpha coefficient of the questionnaire was found to be greater than 0.8, indicating that the reliability of the questionnaire was high.

4.2.5. Measures. The scale consists of two parts: the basic information and the measurement scale. The basic information includes four questions: gender, grade, major, and cultivation method. The measurement scale consists of the above four questionnaires: academic procrastination questionnaire, stress perception questionnaire, self-efficacy for self-regulated learning questionnaire, and self-control questionnaire, with a total of 44 measurement questions. The items are shown in Table 1.

4.3. Data Processing. SPSS 24.0 was used for descriptive statistical analysis, correlation analysis, and regression analysis of the data. Before conducting statistical analysis, the Harman one-way test was used to test all question items in the questionnaire for common method bias, and it was found that seven common factors with eigenvalues greater than one were extracted, and the first common factor explained 28.12% of the total variance, which was less than the standard 40% threshold. Therefore, there was no serious common method bias in the data of this study.

5. Results

5.1. Descriptive Analyses. According to Solomon et al. (1984), scholars defined frequent or always procrastination on a task (item score 4 or 5) as high degree of procrastination, perception that procrastination often or always causes problems (item score 4 or 5) as high procrastination distress, and wanting or always wanting to reduce procrastination on a task most of the time (item score 4 or 5) as high willingness to reduce procrastination, defining academic procrastination tendency into three levels, i.e., mild procrastination, moderate procrastination, and severe procrastination. This study investigated the current situation of academic procrastination among master's students and found that the overall situation of current academic procrastination among master's students is not optimistic. 46.3% of the survey respondents showed moderate procrastination, and about a quarter of master's students showed severe procrastination. On the three subdimensions of procrastination, about 40% of the graduate students showed moderate procrastination tendency and 18% had severe procrastination tendency; more than 77% of the students indicated that procrastination gave

TABLE 1: Questionnaire items.

Latent variables	Measurement factors	Measurement items	Range	Alpha
Academic procrastination	Tendency to procrastinate	I always procrastinate when it comes to reading academic literature.	1-5	0.86
		I always procrastinate when it comes to writing term papers or assignments.		
		I always procrastinate when it comes to publishing a paper or completing a research paper.		
		I always procrastinate when it comes to completing academic-related tasks assigned by my instructors.		
	Degree of distress	The procrastination that occurs when reading academic literature is always a pain for me.	1-5	0.88
		The procrastination that occurs when writing term papers or assignments is always a pain for me.		
		The procrastination that occurs when publishing a paper or completing a research paper is always a pain for me.		
		Procrastination in completing academic-related tasks assigned by my instructors has always been a pain for me.		
	Intention to reduce procrastination	I am very interested in reducing the procrastination that occurs when reading academic literature.	1-5	0.91
		I am very interested in reducing the procrastination that occurs when writing term papers or assignments.		
		I am very interested in reducing the procrastination that occurs when publishing papers or completing research papers.		
		I am very interested in reducing the procrastination that occurs when completing tasks assigned by my instructor.		
Stress perception	Tension	Distracted by the occurrence of something unpredictable.	1-5	0.83
		Feelings of being unable to control the important things in your life.		
		Feeling nervous and stressed.		
		Successfully deal with annoying life troubles.		
	Loss of control	Feel that you can effectively handle the important changes that happen in your life.	1-5	0.76
		Feel confident that you can handle your own personal problems.		
		Feeling that things are going well.		
		Feeling like you cannot handle all the things you have to do.		
		Have a way to control the annoying things in life.		
		Often feel like I am the master of things.		
Self-efficacy for self-regulated learning	Loss of control	Often angry, because many things happen beyond control.	1-7	0.79
		Often think of some things you must accomplish.		
		Often able to master how to organize time.		
		Often feel that difficult things are piling up and you cannot overcome them.		
	Self-efficacy for self-regulated learning	Complete the assignment by the deadline.	1-7	0.79
		Choose to study even when there are other things to do that interest you.		
		Focus on school work.		
		Taking class notes.		
		Go online or to the library for information needed for your assignment.		
		Have a plan for your schoolwork.		
	Self-efficacy for self-regulated learning	Organize your coursework.	1-7	0.79
		Remember the classroom and book content.		
		Find a place to study where there are no distractions.		
		Motivate yourself to do your homework.		

TABLE 1: Continued.

Latent variables	Measurement factors	Measurement items	Range	Alpha
Self-control	Self-regulation	Participate in class discussions.	1-5	0.85
		I can resist temptation very well.		
		People say I have self-control of steel.		
	Impulse control	I can work efficiently for a long-term goal.		0.90
		I will do things that bring me joy but are bad for me.		
		Sometimes I get distracted by having fun and cannot finish my tasks on time.		
		Sometimes I cannot help but do things that I know are wrong		
		I often take action without thinking it through.		

TABLE 2: Results of the survey on the status of procrastination.

Dimensionality	Average value	Standard deviation	Percentage (%)		
Academic delays overall	3.48	0.87	Mild delay	Moderate delay	Severe procrastination
			28.8	46.3	24.9
Tendency to procrastinate academically	3.28	0.93	Mild tendency	Moderate tendency	Severe tendency
			42	39.9	18.1
Procrastination distress level	3.44	0.97	Mild distress	Moderate distress	Severe distress
			32.7	42.3	24.9
Willingness to delay reduction	3.64	0.95	Weaker will	General willingness	Strong will
			26.3	38.4	35.2

moderate or severe distress to themselves; and more than 35% of the graduate students were extremely eager to reduce their procrastination tendency (see Table 2). The above data indicate that academic procrastination is relatively common among the master's graduate students, and at the same time, they are aware that procrastination gives them a certain degree of distress, so they are eager to reduce their procrastination behavior.

5.2. Correlation Analysis. The detailed results of the descriptive statistics and correlation analysis of the study variables are shown in Table 3. The results showed that stress perception was significantly negatively correlated with self-regulated learning efficacy and self-control ($r = -0.492$, $p < 0.0001$; $r = 0.546$, $p < 0.0001$) and positively correlated with academic procrastination ($r = 0.365$, $p < 0.0001$), indicating that the greater the stress perception of master's students, the higher the likelihood of academic procrastination. Self-regulated learning efficacy was significantly negatively correlated with academic procrastination ($r = -0.189$, $p < 0.0001$) and was significantly positively correlated with self-control ($r = 0.504$, $p < 0.0001$), and self-control was significantly negatively correlated with academic procrastination ($p < 0.0001$). The presence of significant correlations among the main variables indicates preliminary support for the research hypothesis.

5.3. Hypothesis Testing

5.3.1. Stratified Regression Analysis. This study used hierarchical regression analysis to test hypotheses 1 and 2. The independent variable stress perception was first centralized, and hierarchical regression analysis was used to examine

the role of stress perception on academic procrastination and the moderating effect of self-regulated learning efficacy on the relationship between stress perception and academic procrastination. Three regression models were developed to examine the relationship between stress perception and academic procrastination. As shown in Table 4, model 1 examined the effects of gender, grade, major, and cultivation method on the dependent variable with an adjusted $R^2 = 0.029$, $p > 0.05$, indicating that gender, grade, major, and cultivation method did not significantly predict academic procrastination. In model 2, stress perception and self-regulated learning efficacy were put into the model to test the main effect, and it was found that stress perception ($\beta = 0.563$, $p = 0.0001$) had a significant positive predictive effect on academic procrastination, so research hypothesis 1 was valid.

Hypothesis 2 tested that the relationship between stress perception and academic procrastination would be moderated by self-regulated learning efficacy, i.e., the relationship would be stronger when self-regulated learning efficacy was at a lower level. As shown in model 3 in Table 4, the interaction term between stress perception and self-regulated learning efficacy was added to the model to test the moderating effect of self-regulated learning efficacy on stress perception and academic procrastination. The results of model 3 showed that the interaction term was a significant predictor of academic procrastination, indicating a significant moderating effect of self-regulated learning efficacy on the relationship between stress perception and academic procrastination ($\beta = -0.443$, $p = 0.0001$), $\Delta R^2 = 0.074$.

To further examine the moderating effects, the moderating variables were grouped according to the mean score plus

TABLE 3: Correlation analysis of variables.

	<i>M</i>	<i>SD</i>	Stress perception	Self-regulation of learning efficacy	Self-control	Academic delay
Stress perception	2.97	0.56	1			
Self-regulation of learning efficacy	4.28	0.73	-0.492**	1		
Self-control	3.39	0.59	-0.546**	0.504**	1	
Academic delay	3.48	0.84	0.365**	-0.189**	-0.224**	1

Note: ***significant at the 0.0001 level, **significant at the 0.01 level, *significant at the 0.05 level, and the same below.

TABLE 4: Stratified regression results.

Variables	Model 1	Model 2	Model 3
Gender	0.028	0.022	0.024
Grade	-0.001	0.062	0.104
Specialties	0.151*	0.170**	0.132*
Cultivation method	0.117	0.049	-0.009
Stress perception		0.563***	0.647***
Self-regulation of learning efficacy		-0.007	-0.025
Stress perception x self-regulated learning efficacy			-0.430***
R^2	0.029	0.170	0.244
ΔR^2	0.029	0.140	0.074
<i>F</i>	1.506	6.773***	9.125***

or minus one standard deviation, with one standard deviation more in the mean score for the group of high self-regulated learning efficacy and one standard deviation less in the mean score for the group of low self-regulated learning efficacy. The interaction effects were plotted for different self-regulated learning efficacy (Figure 2). The slope of the line in the graph reflects the magnitude of the effect of stress perception on academic procrastination. The simple slope test showed that at low levels of self-regulated learning efficacy, stress perception had a significant positive predictive effect on academic procrastination among master's degree students (simple slope = 0.6, $t = 6.827$, $p < 0.0001$), while for students with high self-regulated learning efficacy, stress perception had a negative predictive effect on academic procrastination among master's degree students, but its predictive effect was smaller. For students with high self-regulated learning efficacy, stress perception had a negative predictive effect on academic procrastination, but its predictive effect was smaller (simple slope = 0.249, $t = 2.777$, $p < 0.0001$), indicating that the predictive effect of stress perception on procrastination tended to decrease gradually as the level of individual self-regulated learning efficacy increased, so hypothesis 2 was valid.

5.3.2. Analysis of the Regulatory Role of Self-Control. Hypothesis 3 proposed that self-control plays a moderating role in the relationship between stress perception and academic procrastination among graduate students, and this study used model 1 in the SPSS macro prepared by Hayes (2012) and put the variables of gender, grade, major, and cultivation method into the model for testing. The results

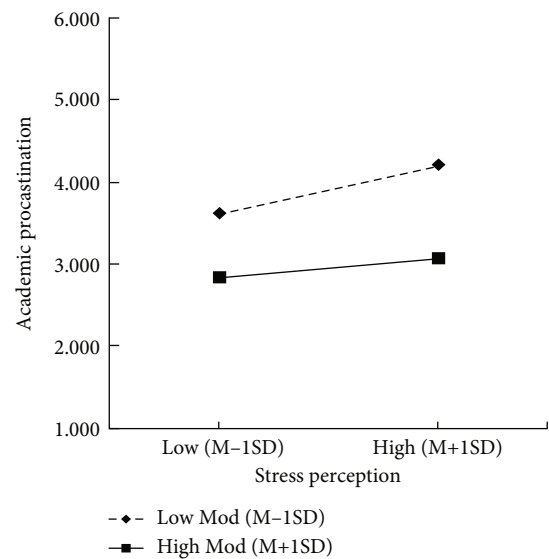


FIGURE 2: The moderating effect of self-regulated learning efficacy on stress perception and academic procrastination.

(Table 5) showed that gender, grade, major, and training style were not significant predictors of academic procrastination, and the interaction term between self-control and stress perception was significant predictor of academic procrastination behavior, indicating that self-control can play a moderating role in the predictive role of stress perception and academic procrastination.

Further simple slope analysis showed (Figure 3) that for individuals with lower levels of self-control (M-1SD), stress

TABLE 5: Tests of moderating effects of self-control.

Regression equation			Overall fit index			Significance of regression coefficients	
Result variables	Predictive variables	R	R^2	F	β	95% CI	t
Academic delay	Gender	0.461	0.212	7.624	0.013	(-0.215, 0.240)	0.108
	Grade				0.076	(-0.077, 0.229)	0.974
	Specialty				0.145	(0.028, 0.263)	2.444*
	Cultivation method				-0.002	(-0.220, 0.217)	-0.016
	Stress perception				0.584	(0.360, 0.809)	0.000***
	Self-control				-0.104	(-0.319, 0.111)	0.340
	Stress perception x self-control				-0.383	(0.151, 0.614)	0.001**

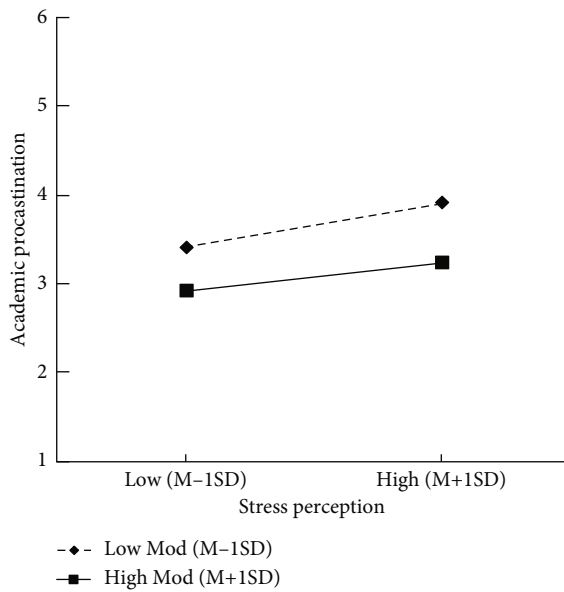


FIGURE 3: The moderating effect of self-control on stress perception and academic procrastination.

perception had a significant positive predictive effect on procrastination, simple slope = 0.446, $t = 5.837$, $p < 0.0001$, while for individuals with higher levels of self-control ($M + 1SD$), stress perception, although it also had a for individuals with higher levels of self-control ($M + 1SD$), stress perception also had a positive predictive effect on procrastination, but its predictive effect was smaller, simple slope = 0.267, $t = 2.812$, $p < 0.05$, indicating that the predictive effect of stress perception on academic procrastination tended to decrease gradually as individuals' levels of self-control increased, so hypothesis 3 was also valid.

5.4. Findings

5.4.1. Stress Perception Has a Positive Predictive Effect on Academic Procrastination. A measure of the master's students' perception of stress showed that their overall mean score was close to 42 (out of a total of 70) and the mean value of each question was close to 3 (2.97 ± 0.56), indicating that the current master's students' perception of stress is at a moderate level and that it varies widely between indi-

viduals. From the correlation analysis of the variables (see Table 3), it is clear that stress perception has a significant positive correlation with academic procrastination, and it is again verified by stratified regression analysis (see Table 4) that master's students' stress perception positively predicts their academic procrastination, meaning that when master's students perceive themselves to be more stressed, they produce more academic procrastination behavior. Thus, our findings showed that stress perceptions were significant predictors of academic procrastination, validating H1, a result that also validates previous research [34], where Lowinger et al. suggested that stress perceptions were influenced by academic procrastination.

5.4.2. Self-Regulation of Learning Efficacy Moderates the Relationship between Stress Perception and Academic Procrastination. Our study found a significant moderating effect of self-regulated learning efficacy in the relationship between stress perception and academic procrastination in H2, as shown in Table 4, the regression coefficient of the interaction between self-regulated learning efficacy and stress perception was significantly negative, indicating that the predictive effect of stress perception on academic procrastination was significantly lower for students with high self-regulated learning efficacy than for students with low self-regulated learning efficacy. So, this result is in line with previous research [35]. Self-regulated learning efficacy plays a moderating role in the relationship between stress perceptions and academic procrastination; as students' self-regulated learning efficacy increases, the positive predictive effect of stress perceptions on academic procrastination tends to decrease. Students who have higher self-regulated learning efficacy tend to regulate their time pressure and cope with multiple academic tasks in a positive procrastination manner to achieve satisfactory results.

5.4.3. Self-Control Plays a Moderating Role between Stress Perception and Academic Procrastination. As shown in Table 5, the interaction term coefficient between self-control and stress perceptions was significantly negative, indicating that self-control plays a moderating role in the relationship between stress perceptions and academic procrastination among master's students. In H3, then, as reported in previous studies, self-control had a significant

moderating role in the relationship between academic procrastination and stress perceptions [36]. Specifically, the predictive effect of perceptions of stress on academic procrastination tends to decrease as an individual's level of self-control increases. Because students with high levels of self-control have greater self-regulation and impulse control, they are able to reconcile their feelings of tension and loss of control in the face of stress, adopt more positive attitudes and behaviors in response to negative procrastination even in the face of greater academic stress, and believe that they can cope well with the difficulties and frustrations of the academic process, thus exhibiting less academic procrastination.

6. Discussion

The results of the study showed that stress perceptions can significantly and positively predict academic procrastination. By changing master's students' perceptions of stress and guiding them to reasonably perceive stress in order to reduce their stress perceptions can effectively improve procrastination behavior. First, accepting stress and changing the mindset of judging stress. Guiding graduate students to change their mindset about stress, accepting stressful events and the fact that they occur, and viewing stress in a more positive way can help them make better use of stressful situations and turn stressful events into opportunities for their own growth. Second, make the best use of stress by viewing the stressful event as a thinking challenge. Defining stress as a challenge means that even if the current stressful event is beyond one's ability, there is a possibility of success as long as one thinks and responds to it with all one's might. The feeling of tension and fear generated by the stressful event is seen as a sense of excitement to meet the challenge, and the stressful response is seen as a valuable resource for one's own response to the stimulating event, which can turn stress into motivation. Lastly, it is important to establish a growth mindset and strengthen cognition. By thinking back on your past stressful experiences, thinking about the important lessons that you have really persevered with or learned from your stressful experiences, summarizing your strengths and the resources and abilities you can use in the future, gradually enriching your cognitive reserve and using more adequate thinking to solve new problems that arise, so as to reduce the fear of the unknown in the face of stressful events. This growing mindset, reinforced many times over, can turn individual setbacks and failures into catalysts for progress and ultimately unleash unlimited potential.

Metacognitive strategies are an important part of self-regulated learning, and enhancing the action ability of graduate students centered on strengthening metacognitive strategies is both a process of self-regulation-oriented cognitive regulation and a process of continuously developing self-efficacy, thus enhancing the moderating effect of self-regulated learning efficacy on stress perception and academic procrastination and reducing academic procrastination behavior of master's students [37]. Specifically, graduate students should first acquire adequate metacognitive knowledge. Through the understanding of metacognition-related knowledge, theories, and strategies, metacognitive awareness is formed, and

graduate students are motivated to use metacognitive strategies to participate in learning and enhance the awareness of self-directed learning. Second, graduate students should be encouraged to use metacognitive strategies to enhance metacognitive experience. For example, using planning strategies to reasonably assess current academic tasks and set effective study plans; using regulation strategies to assess and check the results of stress perception, discover problems and take remedial measures in time. Finally, strengthen metacognitive strategies and improve metacognitive monitoring ability. Master's students need to objectively evaluate their learning effects, reinforce their behavior of completing tasks by using regulation strategies, reflect on the whole learning process, learning tasks and their own performance, and use reflection as a basis to revise their decision-making and practice processes in the process of self-evaluation.

This study shows that self-control moderates the relationship between stress perception and academic procrastination. Therefore, by improving two important factors of self-control, namely, self-regulation and impulse control, the predictive effect of stress perception on academic procrastination can be reduced. Firstly, the prerequisite for improving self-discipline is to have clear goals. Master's students should set effective goals for themselves, then set the completion time according to the size of the goals, scientifically analyze the path and objective conditions to achieve them, and continuously pay attention to the progress of the stages, balance the contradiction between goals and reality, and find like-minded peers to monitor each other's progress. Secondly, improve the impulse control ability. When graduate students face pressure, they should reasonably analyze the dilemma and control their behavior in the light of the actual situation. However, it is often difficult to maintain rational analysis when temptation and impulse come; therefore, individuals need to think ahead. For example, if the temptation is planned in advance, the individual only needs to react according to the plan when faced with the temptation, instead of exerting too much willpower to resist. Finally, individual's self-control will be influenced by others; then, the master's student group can find positive study peers or idols to motivate each other in groups or teams for collaborative progress under the influence of self-control to avoid being failed by others.

7. Conclusion

The study proposes a theoretically based model of regulation that provides a more in-depth explanation of the process by which self-regulated learning efficacy and self-control can influence the process by which stress perception affects academic procrastination in master's students. Although our results have important implications for educators, there are still some limitations. For example, the sample size of the study survey was small and the study data were derived from self-reports. Future researchers can improve our study by expanding the scope and number of samples and by obtaining longitudinal data, for example, by measuring stress among master's students through perceptual devices and recording students' procrastination behaviors at different

times. Despite these limitations, this study provides a reference for school administrators, teachers, and parents to draw on our results to develop strategies to reduce students' academic procrastination.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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