Relationship between Focus-solving Thinking and Academic Procrastination in Junior Middle School Students: A Moderated Mediating Effect

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Abstract—This paper explores the relationship between focus-solving thinking and academic procrastination of junior middle school students. It proposes a moderated mediation model to investigate the mediating effect of self-control on focus-solving thinking and academic procrastination and the moderating effect of psychological capital. A cluster sampling method was adopted in this study. In 2022, 1006 middle school students were investigated by a general social data questionnaire, focus-solving list, self-control scale, academic procrastination questionnaire and positive psychological capital questionnaire to analyze the influence mechanism of focus-solving thinking on academic procrastination. Self-control partially mediates between focus-solving thinking and academic procrastination, and the mediating effect is moderated by psychological capital. The moderating effect is more significant in junior high school students with a high level of psychological capital.

Keywords—Junior high school students; Focus solving thinking; Self control; Procrastination in school; Psychological capital

1 INTRODUCTION

Academic procrastination refers to the tendency of students to delay the completion of academic tasks even though they may lead to negative consequences [1]. Academic procrastination will not only produce negative learning behaviours such as low learning efficiency, decreased interest in learning, decreased academic performance [2], weariness and skipping classes. But also increase the risk of mental diseases such as depression and anxiety and affect the physical and mental health development of students [3]. Studies have shown that academic procrastination behaviour is influenced by many factors, including external factors such as gender, age, grade, growth environment, parents' concern for their study, parent-child

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relationship, teacher-student relationship, parenting style, etc. [4], and internal psychological aspects. For example, reasons such as self-efficacy [5], goal management ability [6], automatic negative thinking [7], psychological capital [8], self-regulation failure [9] and so on. Combined with the causes of academic procrastination [10], in recent years, many scholars have used short-term focused treatment to intervene in students who procrastinate. Short-term focused treatment helps individuals to reconstruct cognition, reduce negative emotions [11], avoid distorted thinking (procrastinating thinking), analyze problems more objectively, be hopeful about the future, pay attention to their resources, set clear goals, take a gradual approach [12], constantly try to complete each "small step", and focus on the ability to achieve the goal within the target deadline. Thus, the study procrastination behaviour can be reduced. Studies have shown that short-term focused treatment is an important measure to reduce academic procrastination effectively [13]. However, there needs to be research to explore the internal mechanism of the impact of short-term focused treatment on academic procrastination [14].

Focus-solving thinking originates from focus-solving short-term therapy, including three dimensions: problem reconstruction [15], goal orientation and resource utilization. Solution-focused thinking focuses on personal resources, goals and ways to achieve these goals. However, academic procrastination [16] is caused by the interaction of complex factors such as behavioural patterns, cognition and emotion. According to the research of Folkman [17] et al., planned problem-solving and positive reevaluation of events can improve the emotional experience, enhance action motivation and reduce negative behaviours [18] such as procrastination. Therefore, this paper proposes hypothesis H1: focus-solving thinking of junior high school students negatively predicts academic procrastination [19].

To summarise, there may be a close relationship between focus-solving thinking, academic procrastination, self-control and psychological capital. However, there still needs to be more relevant research on the relationship. In addition, the focus on the solution of thinking, psychological capital, and self-control as positive psychological qualities of individual development, through the study of different positive psychological qualities on academic procrastination, to reduce the occurrence of academic procrastination from a positive perspective to provide a scientific basis for the future. Therefore, this study takes junior high school students as the research object, adopts the questionnaire survey to explore the relationship between focus-solving [20] thinking and academic procrastination, the mediating effect of self-control in focus-solving thinking and academic procrastination, and the mediating effect of psychological capital, and reveals the relationship between focus solving thinking and academic procrastination (FIG 1).

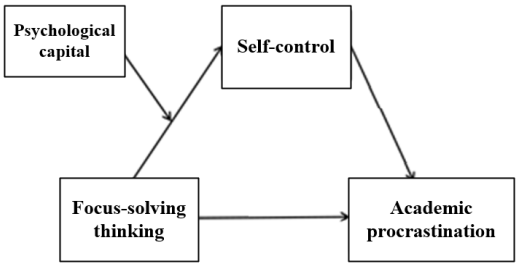

FIG 1. Model of regulation

2 OBJECTS AND METHODS

2.1 Objects

In this study, junior high school students were selected as the research group, and the subjects were mainly from Hebei Province, Yunnan Province, Guangxi Zhuang Autonomous Region and other places. The questionnaire survey was adopted. With the informed consent of school leaders and students' parents, the overall measurement and questionnaire retrieval was carried out by the class as a unit. A total of 1006 junior high school students participated in the survey. After removing 118 invalid questionnaires that missed more than 2/3 of the total questions and regularly answered the questions, 982 valid questionnaires were recovered, with an effective rate of 97.61%.

2.2 Tool of investigation

(1) Junior high school students in general

It mainly includes gender, age, grade, source of students, an only child, father's education level, mother's education level, parents' marital status, etc.

(2) Focused problem-solving thinking

The scale of focused problem-solving thinking consists of 12 items, divided into three dimensions: problem reconstruction, goal orientation and resource utilization. Each dimension has four questions [21], and each adopts a 6-level scoring method. This study's reliability and validity test results showed that Cronbach's α coefficient of the scale was 0.79, indicating that the scale's reliability was within the acceptable range. The scale's fit index in this study's confirmatory factor analysis was χ^2/df 9.29, CFI 0.92, IFI 0.92, NFI 0.91 and RMSEA 0.07.

(3) Self-control

The self-control scale compiled by Tangney and revised by Tan Shuhua et al. was adopted, with a total of 19 questions, including five dimensions of impulse control, healthy habits, resisting temptation, focusing on work and controlling entertainment [22]. The Cronbach's α coefficient of the total scale in this study was 0.86, indicating that the scale's reliability was generally high. The fitting index of confirmatory factor analysis was χ^2/df was 5.58, CFI was 0.87, TLI was 0.84, I was 0.87, and RMSEA was 0.07.

(4) Academic procrastination

The study procrastination questionnaire of middle school students compiled by Ran Hong [23] was adopted. The questionnaire consisted of 22 questions, including five dimensions: negative attitude, sluggish behaviour, lack of planning, indecisiveness and low self-efficacy. The questionnaire was graded at five levels, from "fully consistent" to "completely inconsistent" [24]. The higher the score, the more serious the procrastination behaviour was. In this study, Cronbach's α coefficient of the total scale was 0.90, indicating a high level of reliability. The fit index of this scale in confirmatory factor analysis in this study was χ^2/df was 0.87, CFI was 0.91, TLI was 0.90, I was 0.92, and RMSEA was 0.05.

(5) Psychological capital

The positive psychological capital questionnaire compiled by Zhang Kuo [25] et al. was used for measurement. The questionnaire contained 26 questions, including four dimensions of resilience, self-efficacy, hope and optimism. The questionnaire adopts the Likert scoring method of 7 points. The higher the individual score, the higher the level of psychological capital. In this study, Cronbach's α coefficient [26] of the total questionnaire was 0.90, the fitting index of confirmatory factor analysis was 7.55, CFI was 0.80, TLI was 0.78, I was 0.80, and RMSEA was 0.08.

2.3 Treatment of statistics

SPSS25.0 software was used for descriptive analysis, correlation analysis and regression analysis after the data of valid questionnaires were input, and Amos25 and Bootstrap methods were used to test the mediating effect.

3 RESULTS

3.1 Control and test of standard method deviation

Studies have shown that there may be common method bias in questionnaire data collected through collective measurement and self-assessment [27]. Therefore, this study collected data by filling in anonymous questionnaires and adopted two scoring scales, five-point and six-point, to reduce the bias. After data collection, the Harman single-factor test was used to test the common method bias [28]. The results showed that there were 26 factors with an eigenvalue greater than 1, and the variance explained by the first factor was 21.03%, which was less than the critical standard of 40%, indicating the deviation of the common method was not significant.

3.2 Descriptive statistics and correlation analysis of each variable

The correlation between focus-solving thinking, psychological capital, self-control, academic procrastination, and general demographic data is analyzed. The results show that focus-solving thinking is negatively correlated with academic procrastination. There is a significant positive correlation between focus-solving thinking and self-control, and psychological capital [29]. There is a significant positive correlation between self-control and psychological capital. Self-control was also significantly negatively correlated with academic procrastination.

3.3 An examination of the mediating effect of self-control on focus solving thinking and academic procrastination

According to Wen Zhonglin and Ye Baojuan, using SPSS PROCESS3.3 macro program model 4(Model 4 is a simple intermediary model), The mediating effect of self-control on the relationship between focus-solving thinking and academic procrastination was analyzed after controlling for gender, age, grade, type of students, an only child, father's education level, mother's education level and parents' marital status. Regression analysis showed that the independent variable (focus-solving thinking) positively predicted the mediating variable (self-control) ($\beta=0.44$, $p<0.01$). The independent variable (focus-solving thinking) significantly

negatively predicted the dependent variable (academic procrastination) (β=-0.44, p<0.01); After adding the mediating variable (self-control), the independent variable (focus-solving thinking) still had a significant negative predictive effect on the dependent variable (academic procrastination) (β=-0.17, p<0.01), and the mediating variable (self-control) also had a significant predictive effect on the dependent variable (academic procrastination) (β=-0.63, p<0.01). The mediating effect of self-control was -2.95, and the direct effect was -1.80, accounting for 62.06% and 37.94% of the total effect (-4.75), respectively.

Table 1. The correlation coefficient of each variable (1)

	1	2	3	4	5
1 Gender	——				
2. Age	-0.01	——			
3 Grade of School	-0.03	0.69**	——		
4 Types of students	-0.01	-0.12**	0.05	——	
5 Only Child	0.03	0.10**	0.07*	-0.19**	——
6. Father's education level	-0.01	-0.10**	0.00	0.27**	-0.16**
7. Mother's education level	0.01	-0.13**	-0.01	0.31**	-0.19**
8. Marital status of parents	0.05	-0.07*	-0.07*	0.02	-0.11**
9 Focus solving thinking	-0.02	-0.10**	-0.10**	0.01	-0.05
10. Psychological Capital	-0.12**	-0.07*	-0.02	0.06*	-0.06*
11. Self-control	-0.06	-0.06	-0.08**	0.00	-0.03
12. Academic Procrastination	-0.01	0.09**	0.08*	-0.04	0.06

Note: n=982, gender, age, grade, type of students, only child, father's education level, mother's education level, parents' marital status are dummy variables. *p<.05, **p<.01, the same below.

Table 2. The correlation coefficient of each variable (2)

	6	7	8	9	10	11
1 Gender						
2. Age						
3 Grade of School						
4 Types of students						
5 Only Child						
6. Father's education level	——					
7. Mother's education level	0.53**	——				
8. Marital status of parents	-0.09**	-0.09**	——			

9 Focus solving thinking	0.08*	0.10**	-0.14**	——		
10. Psychological Capital	0.15**	0.16**	-0.18**	0.57**	——	
11. Self-control	0.11**	0.11**	-0.22**	0.45**	0.50**	——
12. Academic Procrastination	-0.14**	-0.15**	0.18**	-0.46**	-0.49**	-0.72**

Table 3. A test of the mediating model of psychological capital

Variable of prediction	Model 1 (Dependent variable: self-control)			Model 2 (Dependent variable: Academic procrastination)		
	β	**t**	**95%CI**	**β**	**t**	**95%CI**
Gender	-0.02	-0.85	[-0.07,0.03]	-0.06	-2.74**	[-0.01,-0.02]
Age	0.07	1.97*	[-0.01,0.13]	0.04	1.27	[-0.02,0.12]
Grade	-0.09	-2.62*	[-0.16,-0.02]	-0.01	-0.38	[-0.08,0.05]
Type of students	-0.03	-1.08	[-0.09,0.03]	0.00	-0.07	[-0.05,0.04]
The only child	-0.01	-0.53	[-0.07,0.04]	0.01	0.45	[-0.03,0.06]
Father's education level	0.05	1.51	[-0.02,0.11]	-0.02	-0.69	[-0.07,0.03]
Mother's education level	0.00	-0.02	[-0.07,0.07]	-0.03	-1.00	[-0.08,0.03]
Marital status of parents	-0.08	-3.11**	[-0.14,-0.03]	0.03	1.16	[-0.02,0.07]
Thinking in focus	0.25	7.81**	[0.19,0.32]	-0.13	-5.29**	[-0.18,-0.08]
Psychological capital	0.36	10.98**	[0.29,0.43]	——	——	
Self control	——	——		-0.66	-26.12**	[-0.71,-0.60]
Focus on solving thinking × psychological capital	0.06	2.91**	[0.02,0.11]	——	——	
R^2	0.60			0.75		
F	50.47			112.54		

The upper and lower limits of Bootstrap 95% confidence interval did not include 0, indicating that self-control partially mediates the relationship between focus-solving thinking and academic procrastination. (Table 1, Table 2)

Secondly, Model 7 in SPSS macro was used for conditional process analysis. The results (Table 3) show that, after adding psychological capital into the model, positive predictive self-control of focus-solving thinking (β=0.25, $p < 0.01$), positive predictive self-control of mental capital

(β=0.36, p < 0.01), and the interaction term of focus solving thinking and mental capital has a significant predictive effect on self-control (β=0.06, p < 0.01), 95% confidence interval is [0.02,0.11], excluding 0. These results indicate that psychological capital moderates in the first half of the mediating path of "focus solving thinking → self-control → academic procrastination".

In order to reveal the nature of this interaction more clearly, a simple slope test is carried out. The results showed that when the level of psychological capital was high, focus-solving thinking had a more substantial promoting effect on self-control, Bsimple=3.49, SE=0.40, p < 0.01; When the level of psychological capital was low, the promoting effect of focus-solving thinking on self-control is weak, but still significant, B simple =1.04, SE=0.41, p < 0.01. In conclusion, the influence of focus-solving thinking on academic procrastination through the mediating process of self-control (FIG 2) is moderated by psychological capital. Compared with junior middle school students with a lower level of focus-solving thinking, the psychological capital of junior middle school students with a higher level of focus-solving thinking can promote self-control more. That is, the conditional mediating effect of psychological capital on academic procrastination through self-control is stronger.

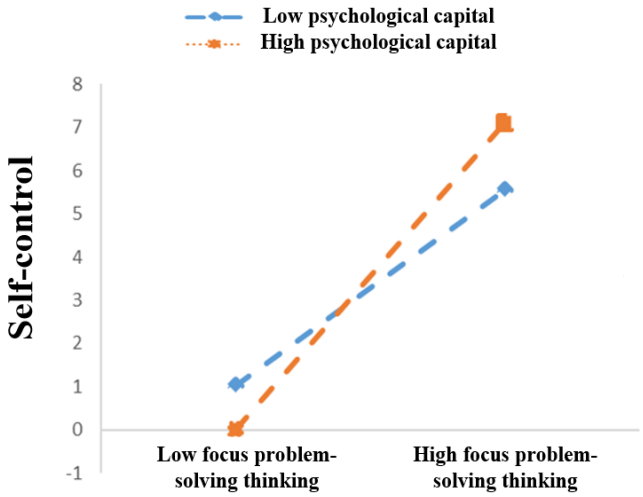

FIG 2. The moderating effect of psychological capital on the relationship between focus solving thinking and self-control

4 CONCLUSION

4.1 The moderating effect of psychological capital on focus-solving thinking and self-control

Focus-solving thinking originates from focus-solving short-term therapy, including three dimensions: problem reconstruction [15], goal orientation and resource utilization. Solution-focused thinking focuses on personal resources, goals and ways to achieve these goals.

However, academic procrastination [16] is caused by the interaction of complex factors such as behavioural patterns, cognition and emotion. According to the research of Folkman [17] et al., planned problem-solving and positive reevaluation of events can improve the emotional experience, enhance action motivation and reduce negative behaviours [18] such as procrastination. Therefore, this paper proposes hypothesis H1: focus-solving thinking of junior high school students negatively predicts academic procrastination [19].

This study found a significant negative correlation between focus-solving thinking and academic procrastination and that focus-solving thinking directly predicted academic procrastination accounting for 37.94% of the total effect. Secondly, there was a significant positive correlation between focus-solving thinking and self-control and a significant negative correlation between self-control and academic procrastination. Self-control partially mediated between focus-solving thinking and academic procrastination, accounting for 62.06% of the total effect, and the indirect effect was significant.

4.2 The moderating effect of psychological capital on focus-solving thinking and self-control

This study found that self-control mediates between focus-solving thinking and academic procrastination of junior middle school students, and psychological capital moderates the mediating model. Specifically, compared with junior high school students with a low level of psychological capital, the focus-solving thinking of students with a high level of psychological capital has a more robust predictive effect on academic procrastination. The adjustment point is located in the first half of the intermediate chain. That is, focus-solving thinking and self-control depend on the psychological capital of junior high school students.

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