

# Moderated mediation effect of hope on the relationship between academic procrastination, psychological wellbeing, and problem behaviors in adolescents

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## Abstract

**Background:** Due to the developmental characteristics of adolescence and many tasks, adolescents are delaying tasks. These academic delay activities lead to stress, and furthermore, some of these stresses lead to problem behaviors. It is necessary to prepare academic interests and alternatives to these issues.

**Objectives:** This study aimed to suggest interventions for preventing problem behaviors in adolescents by analyzing whether hope moderates the mediating effect of psychological well-being in the relationship between academic procrastination and problem behaviors for middle and high school students.

**Methods:** The survey target was 579 middle, and high school students residing in three counties, D, H, and T, in the northwestern part of Chungnam province, who are selected using a convenience sampling method. For data collection, a paper questionnaire methods were performed. For statistical techniques, frequency analysis, reliability analysis, Pearson's bivariate correlation analysis, and moderated mediation effect analysis were applied.

**Results:** First, academic procrastination was positively correlated with hope and internalized problem behaviors, but it was not significantly correlated with psychological wellbeing and externalized problem behaviors. Hope was positively correlated with psychological wellbeing and negatively correlated with internalized problem behaviors and externalized problem behaviors. And psychological well-being was negatively correlated with internalized problem behaviors and externalized problem behaviors. Second, hope moderated the effects of academic procrastination on internalized and externalized problem behaviors through psychological wellbeing.

**Conclusions:** This study suggested that it is possible to increase hope in order to alleviate the effect of academic procrastination on problem behaviors through psychological wellbeing

**Keywords:** academic procrastination, hope, psychological wellbeing, internalized problem behaviour, externalized problem behaviour.

## 1. Introduction

Academic procrastination is the act of unnecessarily delaying the initiation and completion of one's academic tasks while feeling subjective discomfort [1,2]. Various variables such as fear of failure, task aversion, perfectionism, self-esteem, self-efficacy, impulsivity, and achievement motivation have been studied as variables affecting academic procrastination [3]. Such academic procrastination was highest

in those in their twenties when autonomy increased, and it was reported that 80% to 90% of college students engage in procrastination [4]. In addition, academic procrastination can occur frequently even in adolescence, and its frequency tends to decrease with increasing age [3]. In particular, avoidant delayed behavior in adolescence can be more strongly fixed than that of adult learners [5], and its influence on the academic process has developmental characteristics that can continue into adulthood. Therefore, research on maladaptive behaviors such as academic procrastination of adolescent learners has important meaning [6].

Academic procrastination impedes successful academic achievement [7], and accompanies negative emotions such as negative attitudes toward learning, and shame [8]. In addition, it occurs due to the complex interaction of cognitive, emotional, and behavioral factors and also causes irrational and dysfunctional behavior [9].

Meanwhile, academic procrastination is also related to the problem behaviors of adolescents. The problem behaviors of adolescents can be divided into internalized and externalized problems [10]. Internalized problem behaviors refer to internalized and over-controlled behaviors such as passive and socially atrophied behaviors, depression, anxiety, and physical symptoms [11]. The level of internalized problem behaviors tends to increase as the grade level increases [12]. In particular, the internalized problem behaviors of adolescents are invisible to the outside unlike the symptoms of adults, so it tends to receive relatively less attention than externalized problem behaviors in clinical scenes and empirical studies [13]. Adolescents with internalized problems have a depressed mood, decreased interest, pleasure, and will to live, or withdrawn from interpersonal relationships and isolate themselves [14]. When it gets serious, it can lead to more serious consequences such as self-harm, suicidal thoughts, and suicide attempts, threatening the mental health and psychological wellbeing of adolescents [15].

On the other hand, externalized problem behaviors refer to the expression of uncontrolled behaviors and unsocialized behaviors, specifically, behaviors that directly expose negative emotions to others, and behaviors that are not controlled by anger, aggression, or frustration [16]. Adolescents with externalized problem behaviors had difficulties in self-control by overexpressing them in an inappropriate way [17], which led to social problems such as conflict with parents, friends, and teachers, difficulties in academic achievement, school maladjustment, and crime. They become more extreme and impulsive towards themselves or others [18].

On the other hand, it was reported that academic procrastination is closely related to the internalized and externalized problem behaviors of adolescents. Academic procrastination was reported as a predictor of internalized problem behaviors such as depression and anxiety [19], and it was also reported that academic procrastination of adolescents was related to low hope and low academic achievement [20]. However, there are still only a few studies dealing with the relationship between academic procrastination and internalized and externalized problem behaviors. As a way to alleviate it, it was tried to verify psychological wellbeing as a mediator and hope as a moderator. First, psychological well-being, a mediator, is the satisfaction that individuals subjectively feel and evaluate their life, and it means positive psychological functions and experiences [21]. People with high psychological well-being accept themselves as they are, make their own decisions, have control over their environment, maintain positive interpersonal relationships, have a purpose in life, and have a

motivation to grow [22]. In addition, adolescents with high psychological well-being create positive effects in various fields of life such as academic performance ability, academic achievement, interpersonal ability, psychological adaptation ability, and health, and have the high potential to grow into healthy adults as well as being favorable to others [23].

Academic procrastination negatively affects psychological well-being, psychological well-being negatively affects problem behaviors, and therefore, psychological well-being is predicted to play a mediating role in the relationship between academic procrastination and problem behaviors. In particular, psychological well-being is predicted to play a mediating role to offset some of these increases as academic procrastination increases problem behaviors. According to previous studies, academic procrastination has been reported to decrease subjective well-being [24], and psychological well-being has been reported as a predictor of internalized problem behaviors such as depression and anxiety [19]. Based on these results, this study attempted to verify whether psychological well-being plays a mediating role in the relationship between academic procrastination and problem behaviors.

On the other hand, hope, a moderated mediator, is the power to believe in the feeling that we can do better in the future, to expose new powers to achieve high-level behaviors, and to stimulate the active pursuit of new experiences [25]. Snyder and his colleagues, scholars who developed this vague hope into a measurable concept, defined hope as a state of positive motivation for the successful outcome expected through the interaction of pathways thinking and agency thinking [26]. They also said that hope consists of agency thinking and pathways thinking. Agency thinking, as a motivating factor of hope, is the perceived ability of an individual to use his or her various methods to reach the desired goal. Pathways thinking refers to an individual's perceived ability to find possible methods and alternatives in pursuing a goal when an individual has a certain purpose. In order for hope to be realized concretely, both agency thinking and pathways thinking are necessary.

When the level of hope is high, it shows a quick recovery from stress [27], and it is better tolerated even when there is physical pain [28]. Also, a high level of hope is closely related to academic achievement in adolescence and various positive social and emotional outcomes in adulthood [29].

It has been reported that hope plays a moderating role that increases or alleviates the relationship between two variables. In a study on college students, hope played a moderating role by increasing the effect of emotional approach coping on flourishing [30], and played a moderating role in alleviating the relationship between negative life events and depression [31]. Judging from the results of these preceding studies, hope is predicted to play a moderating role in alleviating the negative effects of academic procrastination on psychological well-being, so it is necessary to verify this. It is also necessary to verify whether academic procrastination moderates the mediation of the effects of psychological well-being on internalized and externalized problem behaviors.

## **Objectives**

Therefore, this study was to suggest interventions for preventing problem behaviors in adolescents by analyzing whether hope moderates the mediating effect of psychological well-being in the relationship between academic procrastination and problem behaviors for middle and high school students.

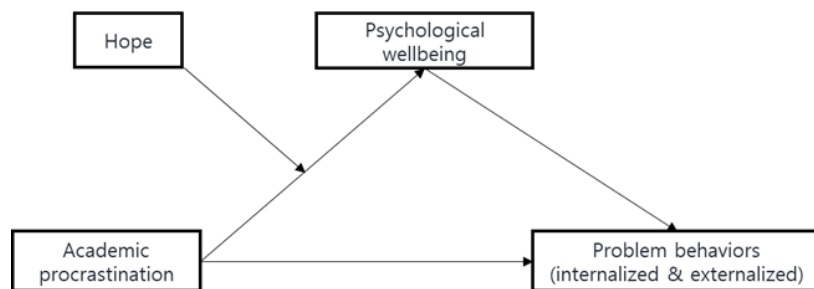
To achieve this research purpose, the following research questions were established. First, what is the correlation between variables? Second, does hope moderate the mediating effects of psychological

well-being in the relationship between academic procrastination and internalized problem behaviors? Third, does hope moderate the mediating effects of psychological well-being in the relationship between academic procrastination and externalized problem behaviors?

## 2. Methods

### 1) Research Model

This research model was set according to moderated mediation analysis procedure of model No. 7 of PROCESS macro ver. 4.1. like [Fig. 1]. Specifically, a model was established to verify that hope moderates the mediation effect of psychological wellbeing in the relationship between academic procrastination and problem behaviors.



[Figure 1] Research model

### 2) Participants and data collection

The survey target was 600 middle, and high school students residing in three counties, D, H, and T, in the northwestern part of Chungnam province, who are selected using a convenience sampling method. For data collection, a paper questionnaire methods were performed. For the survey, the researcher explained the purpose and method of the questionnaire to the homeroom teacher of each school class, and after obtaining the research consent from the research subjects, the questionnaire was collected immediately after the consenting subjects completed it. Excluding uncollected questionnaires and questionnaires with poor responses, 579 copies were used for the final analysis.

Middle school students accounted for 50.3% of the survey subjects, which was almost similar to high school students. By gender, there were more female students (57.6%) than male students (42.4%), and the average age was 15 years old. 72.9% of the respondents lived with their parents, 11.9% with their grandparents, and 9.5% with their single parents.

### 3) Research tools

#### (1) Academic procrastination

In this study, we used the scale that Lee [32] modified Aitken [33]'s procrastination scale for adolescents to measure procrastination throughout the adolescent's school life. This scale consists of a total of 19 items, and each item was rated and answered on a 5-point Likert scale ranging from 1 point of 'not at all' to 5 points of 'strongly agree'. A higher score means more procrastination throughout school life. The reliability of this scale was .808 for Cronbach's  $\alpha$ .

## (2) Hope

To measure the hope of adolescents, the scale (K-DHS) developed by Snyder et al. [26] and validated by Choi et al. [34] for the Korean situation was used. This scale has a total of 12 items, consisting of 4 items of agency thinking, 4 items of pathways thinking, and 4 items of falsehood. It is a 5-point Likert scale ranging from 1 point of 'not at all' 5 points to 'strongly agree'. The higher the score, the higher the level of hope. Cronbach's  $\alpha = .695$  for agency thinking and Cronbach's  $\alpha = .689$  for pathways thinking were somewhat lower.

## (3) Psychological wellbeing

The psychological well-being scale developed by Kaplan and Maehr [35] and modified by Moon [36] for the situation of secondary school students in Korea was used. This scale consists of 15 items and is a 5-point Likert scale ranging from 1 point of 'not at all' 5 points to 'strongly agree'. The higher the score, the more stable the emotions and the better control over impulsive emotions, and the reliability of Cronbach's  $\alpha$  was .86.

## (4) Problem behavior

For problem behavior, we used the Korean Child Behavior Checklist (K\_CBCL) standardized by Oh et al. [37] based on the Child Behavior Checklist (CBCL) developed by Achenbach and Edelbrock [38]. There were a total of 119 questions on this scale, but the researcher selected and used the appropriate questions for the research subject. That is, among the variables related to academic procrastination, 15 items of depression and anxiety, which are internalized problems, and 11 items of delinquency, which are externalized problems, a total of 26 items were used. Each item is designed to measure the behavioral problems the adolescents have shown in the past year, and is on a 5-point Likert scale ranging from 1 point of 'not at all' to 5 points 'strongly agree'. The higher the score, the higher the internalized and externalized problem behaviors. Reliability of internalized problem behavior was Cronbach's  $\alpha = .872$ , and Cronbach's  $\alpha = .801$  of externalized problem behavior.

## 4) Data analysis

In this study, SPSS PC+ Win. Ver. 25.0 and SPSS PROCESS macro Ver. 4.1 were used for analysis. For statistical techniques applied to data analysis, frequency analysis, reliability analysis, and Pearson's bivariate correlation analysis were applied, and model 7 of the SPSS PROCESS macro was used for moderated mediation effect analysis. And when analyzing the moderated mediation effect, the confidence level was set to 95%, and the number of bootstrap samples was set to 5,000. The conditions for confirming the conditional effect were set to M and  $M \pm SD$ , and the independent and moderating variables were analyzed after centering the mean.

## 3. Results

### 1) Correlation between main variables

<Table 1> shows the results of Pearson's bivariate correlation analysis. Academic procrastination had a positive correlation with hope ( $r=.301$ ,  $p<.01$ ) and with internalized problem behaviors ( $r=.105$ ,  $p<.05$ ), but had no significance with psychological wellbeing ( $r=-.038$ ,  $p>.05$ ) and externalized problem behaviors ( $r=-.008$ ,  $p>.05$ ). Hope is positively correlated with psychological wellbeing ( $r=.410$

$p < .01$ ), negatively correlated with internalized problem behaviors ( $r = -.251$ ,  $p < .01$ ) and externalized problem behaviors ( $r = -.096$ ,  $p < .05$ ). Psychological wellbeing was negatively correlated with internalized problem behaviors ( $r = -.705$ ,  $p < .01$ ) and externalized problem behaviors ( $r = -.355$ ,  $p < .01$ ).

As a result of descriptive statistics, academic procrastination, hope, and psychological wellbeing were higher than the median value (3 points), and depression and problem behaviors were lower than the median value.

<Table 1> Correlation analysis and descriptive statistics of major variables

	Academic procrastination	Hope	Psychological wellbeing	Problem behaviors	
				internalized	externalized
Academic procrastination	1				
Hope	.301**	1			
Psychological wellbeing	-.038	.410**	1		
Problem behaviors	internalized	.105*	-.251**	-.705**	1
	externalized	-.008	-.096*	-.355**	.514**
M	3.0645	2.6975	3.1853	2.2189	1.5740
SD	.33126	.42007	.55081	.63133	.44514

\* $p < .05$ , \*\* $p < .01$

2) Moderated mediation effect of hope on the relationship between academic procrastination, psychological wellbeing, and internalized problem behaviors

In order to verify whether hope moderates the mediating effect of academic procrastination on internalized problem behaviors through psychological wellbeing, it was analyzed using Model 7 of the SPSS PROCESS macro which was proposed by Hayes [39], and the results are shown in <Table 2>.

The independent variable, academic procrastination, had a significant negative effect on psychological wellbeing ( $-.2687$ ,  $p < .001$ ), and hope had a positive effect on psychological wellbeing ( $.6120$ ,  $p < .001$ ). The interaction term between academic procrastination and hope had a statistically significant effect on psychological wellbeing ( $.2898$ ,  $p < .01$ ), and therefore had a moderating effect. In other words, hope alleviated the negative effect of academic procrastination on psychological wellbeing.

As a result of analyzing the conditional effect (M,  $M \pm SD$ ) of academic procrastination according to the value of hope, hope was significant in M-SD and M values. When hope increased from  $-.4204$  (M-SD) to  $.0000$  (M), the negative effect of academic procrastination on psychological wellbeing decreased, showing a buffering effect.

As a result of analyzing Johnson-Neyman's significance area, the conditional effect of hope was significant only in the area where the hope value was lower than .3823, which accounted for 82.0% of the survey subjects. And it was no longer significant in the area where the hope value was higher than .3823, and these areas occupied 18.0% of the survey subjects. This means that if hope is higher than .3823, it does not moderate the relationship between academic procrastination and psychological wellbeing.

Since the moderating effect of hope was statistically significant, the results of visualizing the moderating effect to confirm the slope are shown in [Figure 3]. In order to confirm the pattern of significant interaction, the slope of hope, a moderating variable, was examined according to the low (M-SD), medium (M), and high (M+SD) conditions. As academic procrastination increased, psychological wellbeing decreased, and the decreasing slope of the group with low hope was sharper than that of the group with high hope.

The effect of academic procrastination on internalized problem behaviors through psychological wellbeing was analyzed to see if hope moderates the mediation. As a result of the analysis, the conditional indirect effect was significant in the M-SD and M values, and the moderated mediation effect was verified. In other words, when hope increases from M-SD to M value, the effect of academic procrastination on internalized problem behaviors via psychological wellbeing is reduced, and therefore hope served as a buffer.

Hope's moderated mediation effect index was -.2331, and in the bootstrap confidence interval (CI), there was no 0 between the lower limit value and the upper limit value (-.4039 ~ -.0592), so the moderated mediation effect index was statistically significant.

<Table 2> Analysis of moderated mediation effect of hope in the relationship between academic procrastination, psychological wellbeing, and internalized problem behaviors

Mediating variable model						
(DV: Psychological wellbeing)						
Variables	$\beta$	SE	t value	p	LLCI*	ULCI**
Constant	3.1729	.0209	151.9575	.0000	3.1319	3.2139
Academic procrastination	-.2687	.0654	-4.1080	.0000	-.3971	-.1402
Hope	.6120	.0511	11.9826	.0000	.5117	.7123
Procrastination $\times$ hope	.2898	.1004	2.8867	.0040	.0926	.4870
Conditional effects of the academic procrastination at values of hopes:						
Hope	Effect	se	t value	p	LLCI*	ULCI**
-.4204	-.3905	.0727	-5.3751	.0000	-.5332	-.2478

.0000	-.2687	.0654	-4.1080	.0000	-.3971	-.1402
.4204	-.1468	.0827	-1.7753	.0764	-.3092	.0156

## Johnson-Neyman's Conditional Effect Significance Area

hope	% below	% above
.3823	82.01	17.99

Significance area of conditional effects of the academic procrastination at values of hopes:

hope	Effect	F	t value	p	LLCI*	ULCI**
-1.5725	-.7244	.1621	-4.4684	.0000	-1.0428	-.4060
			.			
			.			
			.			
.2963	-.1828	.0756	-2.4186	.0159	-.3312	-.0343
<b>.3823</b>	<b>-.1579</b>	<b>.0804</b>	<b>-1.9641</b>	<b>.0500</b>	<b>-.3157</b>	<b>.0000</b>
.4400	-.1411	.0839	-1.6813	.0932	-.3060	.0273
			.			
			.			
			.			
1.3025	1.3025	.1543	.7055	.4808	-.01941	.4118

## Dependent variable model

(DV: Internalized problem behaviors)

Variables	Coeff	SE	t value	p	LLCI*	ULCI**
Constant	4.7804	.1089	43.9146	.0000	4.5666	4.9943
Academic procrastination	.1494	.0560	2.6680	.0078	.0394	.2594
Psychological wellbeing	-.8042	.0337	-23.8979	.0000	-.8704	-.7381

Direct effect of X on Y: Academic procrastination → internalized problem behaviors



Effect	se	t value	p	BootLLCI*	BootULCI**
.1494	.0566	2.6680	.0078	.0394	.2594

Conditional indirect effects of X on Y: academic procrastination → psychological wellbeing → internalized problem behaviors

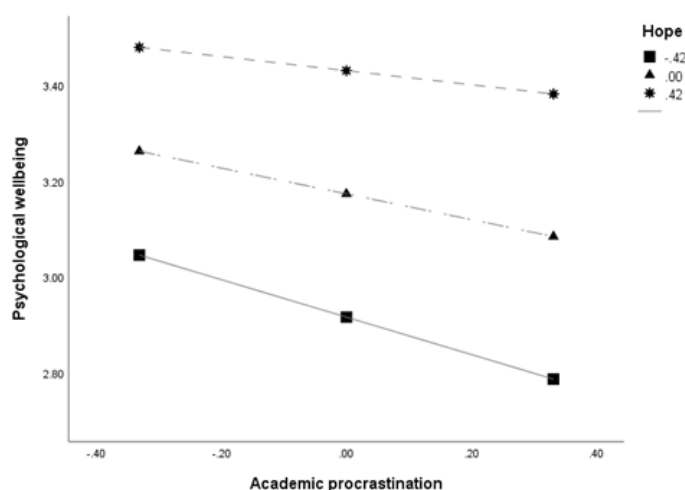
Hope	Effect	BootSE	BootLLCI*	BootULCI**
-.4204	.3141	.0573	.1917	.4210
.0000	.2161	.0560	.1054	.3255
.4204	.1181	.0744	-.0268	.2647

Index of moderated mediation:

Hope	Index	BootSE	BootLLCI*	BootULCI**
	-.2331	.0848	-.4039	-.0592

\*LLCI = lower bootstrap value within 95% confidence interval

\*\*ULCI=Upper Bootstrap value with 95% confidence interval



[Figure 2] Moderating effect of hope in the relationship between academic procrastination and psychological wellbeing

3) Moderated mediation effect of hope in relationship between academic procrastination, psychological wellbeing, and externalized problem behaviors

The results of verifying whether hope moderates the mediation of academic procrastination on externalized problem behaviors via psychological wellbeing are shown in <Table 3>. In <Table 3>, the moderating effect of hope in the relationship between academic procrastination and psychological

wellbeing is the same as the previous result, so tables, figures, and interpretations are omitted, and only moderated mediation effect results are presented.

The effect of academic procrastination on externalized problem behaviors via psychological wellbeing under the three conditions of hope was M-SD (.0840, .0419 ~ .1265) and M (.0596, .0266 ~ .0956), which is significant, so the moderated mediation effect of hope was verified. That is, when hope increases from M-SD to M value, the effect of academic procrastination on externalized problem behaviors through psychological wellbeing is reduced, so hope served as a buffer.

Hope's moderated mediation effect index was -.0832, and there was no 0 between the lower and upper limits (-.1456, .0175) in the bootstrap confidence interval (CI), so the moderated mediation effect index was statistically significant.

<Table 3> Analysis of moderated mediation effect of hope in the relationship between academic procrastination, psychological wellbeing, and externalized problem behaviors

Dependent variable model						
(DV: Externalized problem behaviors)						
Variables	Coeff	SE	t value	p	LLCI*	ULCI**
Constant	2.4882	.1018	24.4369	.0000	2.2882	2.6882
Academic procrastination	-.0288	.0524	-.5494	.5829	-.1317	.0741
Psychological wellbeing	-.2870	.0315	-9.1112	.0000	-.3489	-.2251
Direct effect of X on Y: Academic procrastination → externalized problem behaviors						
Effect	se	t	p	BootLLCI*	BootULCI**	
-.0288	.0524	-.5494	.5829	-.1317	.0741	
Conditional indirect effects of X on Y: Academic procrastination → psychological wellbeing → externalized problem behaviors						
Hope	Effect	BootSE	BootLLCI*	BootULCI**		
-.4204	.1121	.0221	.0677	.1561		
.0000	.0711	.0208	.0368	.1200		
.4204	.0412	.0267	-.0095	.0969		
Index of moderated mediation:						
Hope	Index	BootSE	BootLLCI*	BootULCI**		

	-.0832	.0309	-.1456	-.0175
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\*LLCI = lower bootstrap value within 95% confidence interval

\*\*ULCI=Upper Bootstrap value with 95% confidence interval

#### 4. Discussion

This study analyzed the moderated mediation effect of hope in the effects of academic procrastination on problem behaviors through psychological wellbeing targeting adolescents and suggests a way to reduce internalized and externalized problem behaviors in adolescents. The discussions based on the research results are as follows.

First, academic procrastination was positively correlated with hope and internalized problem behaviors, but it was not significantly correlated with psychological wellbeing and externalized problem behaviors. Hope was positively correlated with psychological wellbeing and negatively correlated with internalized problem behaviors and externalized problem behaviors. And psychological well-being was negatively correlated with internalized problem behaviors and externalized problem behaviors. First of all, academic procrastination had a positive correlation with hope. Even if the task is delayed, if the hope that can be completed within a set time is high, the task is intentionally delayed. Therefore, academic procrastination and hope had a positive correlation. These results were consistent with the study results of Lee [20]. In addition, the result that academic procrastination is positively correlated with internalized problem behaviors is in line with the study results of Arifiana et al. [24]. In addition, the result that hope was positively correlated with psychological wellbeing, and negatively correlated with internalized problem behaviors and externalized problem behaviors is in line with the findings of Farran [19].

Second, hope moderated the effects of academic procrastination on internalized and externalized problem behaviors through psychological wellbeing. Hope serves as a buffer to reduce the negative effects of academic procrastination on internalized and externalized problem behaviors through psychological wellbeing. That is, when hope increased from M-SD to M value, the effect of academic procrastination on internalized and externalized problem behaviors through psychological wellbeing decreased. Therefore, the moderated mediation effect was verified in the M-SD and M values of hope, but the moderated mediation effect was not verified in the group with high hope (M+SD). This is believed to be because, when hope is high, the effect of academic procrastination on internalized and externalized problem behaviors through psychological wellbeing disappears.

Also, the effect of academic procrastination on internalized problem behaviors through psychological wellbeing showed similar results to the effect on externalized problem behaviors. Similar results were obtained for both the buffering effect of hope and the moderated mediation effect in the group with high hope in the path from academic procrastination to problem behaviors through psychological wellbeing.

In conclusion, it was suggested that it is possible to increase hope in order to alleviate the effect of academic procrastination on problem behaviors through psychological wellbeing.

Recommendations for follow-up research are as follows. First, this study has limitations in generalizing the results of the study to a national level because participants were sampled centered on three counties in one province. In follow-up studies, it is necessary to expand the possibility of generalization through the various sampling of study subjects. Second, there may be differences of opinion as this study is conducted according to the subjectivity of the respondents in a way of responding to the self-report questionnaire. Therefore, it is necessary to measure it using an objective behavioral evaluation scale. Despite the limitations of these studies, it is meaningful to this study that identified whether hope moderates the effect of academic procrastination on problem behaviors through psychological well-being and suggested a way to reduce the problem behaviors of adolescents through these results.

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