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Dual Mediation Model of Major Awareness and Hope Between Learning Motive and Academic Achievement in College Students

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Abstract: Students majoring in health education are unable to reach the level of a college major because they do not know how their major is connected to the workplace and therefore, what and to what extent they should learn in college. Accordingly, research on awareness of the major and related variables is needed. This study aims to suggest ways to increase the academic achievement of college students by identifying the dual mediators effect of major awareness and hope in the link between learning motive and academic achievement. A total of 314 respondents were purposively sampled from undergraduates and graduates of one of the colleges in Guangdong of China, and data were collected using a questionnaire survey method. The collected data were analyzed utilizing SPSS PC+ Win. Ver. 26.0 and PROCESS macro Ver. 4.2. The applied statistical techniques were frequency analysis, reliability analysis, correlation analysis, and dual mediation effect analysis. The dual mediating effect was verified by the bootstrap method. First, research findings revealed that there was a positive and significant correlation between learning motive, major awareness, hope, and academic achievement. Second, it was revealed that major awareness and hope were dual mediators in the association between learning motive and academic achievement. It was confirmed that learning motive has a positive relation with academic achievement via major awareness and hope. To improve academic achievement for college students, program development and implementation to improve major awareness and hope were suggested.

Keywords: Academic Achievement, Dual Mediating Effect, Hope, Learning Motive, Major Awareness, SPSS PROCESS Macro

1. Introduction

Academic achievement is the most important factor in college education because it reflects the result of student learning, and is an indirect reflection of the efforts and capabilities of professors, and the evaluation of universities. Therefore, it has received much academic attention. However, continuous research is needed because the factors that affect academic achievement include various factors such as individual students, educators, contents, and methods.

Several studies have been implemented in the past that learning motive affects academic achievement, and the results are also reported to be [1][2]. However, while it is important to study that learning motive directly affects learning achievement, it is also important to study the variables that mediate in the associations between these two variables. This study started with an interest in these mediating variables.

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The awareness of university students about their major, that is, major awareness, means recognizing what the contents of their majors are and what areas are related to employment after graduation. This major awareness is influenced by learning motive[3], and furthermore, when the major awareness increases, academic achievement improve[4]. In this case, major awareness mediates in the effect of learning motive on academic achievement.

Hope is said to be the driving force of life, and it is also becoming an important driving force in learning. If these hopes are also high in learning motivation, not only are learning-related hopes high [5] and furthermore, these hopes affect academic achievement[6]. Therefore, hope also mediates in the association between learning motive and academic achievement, and further studies on the mediating role of hope will suggest ways to improve academic achievement.

Therefore, this study aims to suggest ways to increase the academic achievement of college students by confirming the dual mediators effect of major awareness and hope in the association between learning motive and academic achievement. For this, two research questions were established. First, what is the correlation between learning motive, major awareness, hope, and academic achievement? Second, are major awareness and hope dual mediators in the effect of learning motive on academic achievement?

2. Literature Review

2.1 Learning Motive and Academic Achievement

Learning motive primarily refers to stimulating people's psychology during learning activities. People generate an internal driving force to cause learning activities and direct this driving force toward the desired goal and state of mind through stimulation and encouragement[7]. These learning motive are divided into internal and external motive. Internal motive is known as the intrinsic drive (a motivated state), and external motive is the temptation of things other than meeting specific needs[8]. Internal motivation stems from learners' interest in learning goals as well as the pleasure of satisfying personal accomplishments and self-esteem while learning. External motivation is a manifestation of achievement or value caused by outside factors, and it also serves as a supplement to internal motivation[9].

On the other hand, academic achievement is a critical criterion for evaluating students' academic performance. It is the result that learners get when they finish something or are in the process of implementing something and feel happy or successful about what they have done, that is, a psychological feeling that the expected results are consistent with the actual results[10]. Therefore, academic achievement includes not only the amount of acquired knowledge, but also the comprehensive ones such as changes in behavior and consciousness, and consequent emotional changes. Despite the diversity of academic achievement, it is common to measure academic achievement in close relationship with individual learning needs and institutional educational goals. That is, academic achievement in pedagogy is closely related to students'l goals, which is individual learning goals, programs goals, or teachers' teaching goals, among many other types of goals[11].

Learning motive and academic achievement are directly related. Its relevance has been verified in various studies. Learning motive and academic achievement are conjunctly related. Its relevance has been verified in multiple studies. A study of 252 Tehran University students showed a high association learning motive and academic achievement[1]. A study of physical education and sports school students reported that academic achievement increased when extrinsic motivation increased[2]. From these results, learning motive is judged to have a direct effect on academic achievement. However, the research interest needs to explore the variables that mediate between these two variables.

2.2 Mediating Effect of Major Awareness and Hope

This study paid attention to whether major awareness and hope mediate in the effect of learning motive on academic achievement.

Major awareness is a psychological process that allows students to identify and recognize their majors, and it allows them to explore and study more professional knowledge through positive and active behaviors[12]. Major awareness focuses on students' major awareness and recognition, with the goal of facilitating teaching students based on their aptitude, carrying out effective teaching activities, and developing more appropriate talent training programs[13]. There are few studies that show that such major cognition is influenced by learning motive and, conversely, plays a mediating role by influencing academic achievement. However, similar studies were reviewed. Both inherent and extrinsic motives had a significantly positive influence on major practice contents[3], and the individual-major fit was found to have a positive influence on learning immersion[4]. From these results, it is inferred that major awareness mediates in the effect of learning motive on academic achievement, so this was verified.

Hope is conceptualized as an individual's traits, or disposition, of having motivational energy for a desired goal and achieving that goal through specific pathways[14]. It comprises sub-factors of agency thinking, willpower and pathways thinking, waypower, and these two factors are a cognitive set that pursues a goal while interacting[5].

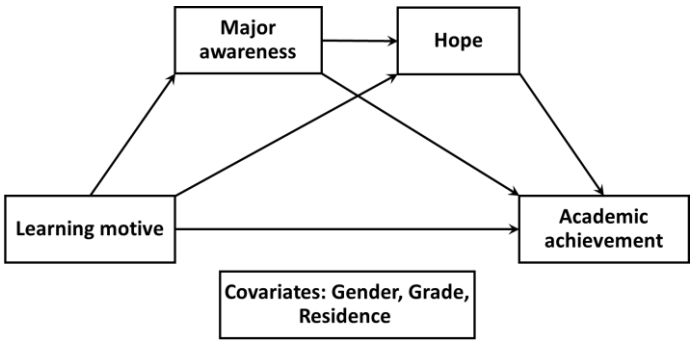
It has been reported that hope is related to learning motivation, which is an independent variable, and affects academic achievement, which is a dependent variable. Students with high hopes were found to have higher motivation than students with lower hopes[5]. In a study targeting children, hope was not significantly correlated with intellectual ability, but it was correlated with academic achievement, and it was found that children with high hopes had a high achievement tendency in the cognitive domain[6]. A study of elementary school students revealed that there is also a positive impact of hope on academic achievement[15].

In previous studies, it is inferred that learning motive affects hope, and hope affects academic achievement, so hope mediates in the association between these two variables. However, studies on the mediating effect of hope are still lacking.

In addition, the simple mediating role of major awareness and hope was confirmed, and this study tried to confirm whether these two mediators played a dual mediating role in the series. This study was to confirm whether major awareness and hope mediate in the effect of learning motive on academic achievement targeting college students.

3. Research Methods

3.1 Research Model



[Fig. 1] Research Diagram

To verify the dual mediators effect of major awareness and hope in the association between learning motive and academic achievement in college students, it was set up as shown in [Fig. 1] depending on the analysis procedure in the model 6 of the PROCESS macro version 4.2.

3.2 Participants and Data Collection

The respondents of this study were undergraduates and graduates of stomatology majors from a college in Guangdong of China, who voluntarily participated in this study. The college in close proximity to which the research results can be applied practically were selected. Data were collected through a questionnaire survey. Data were collected during the first month of March 2023. A total of 400 students were intentionally selected for the survey and questionnaires were distributed to them. A total of 314 students were collected and used to derive the results of this study excluding questionnaires with errors.

The survey was conducted after obtaining the consent of the respondent to sign the study, and it was notified that the survey could be discontinued at any time if desired. Reciprocal gifts were provided after the survey was completed.

The general traits of the subjects are in the following. Males included 42.7% and females 57.3%. By grade, the freshmen accounted for 51.3%, the sophomores 18.5%, the juniors 10.8%, and the graduates 19.4%. As for residence, 80.3% were urban and 19.7% were rural.

3.3 Instrumentation

3.3.1 Learning Motive

The learning motive scale proposed by Tighe et al.[16], and revised by Chi Liping, Xin Ziqiang[17] was used in the current study. The scale comprises 29 questions about internal and external motives. All items were on a 5-point Likert scale ranging from 1 “not at all” to 5 “always”, with higher scores indicating a higher learning motive. In this study, Cronbach's α, which refers to the internal consistency, was .777.

3.3.2 Major Awareness

The major awareness scale proposed by Qin Panbo[18] was used in this study. The scale contains 23 questions that primarily assess appropriateness, cognition, behavior, and emotion. Each item was rated on a 5-point Likert scale ranging from 1 “not at all” to 5 “always”, with higher scores indicating higher major awareness. In this study, Cronbach's α, which refers to the internal consistency, was . 923.

3.3.3 Hope

The version of the Korean Hope Scale (K-DHS) which was revised and validated by [19] and developed by [20] was used. It included four agency thinking questions that measured whether a goal was set, and four pathways thinking questions that measured how to reach the goal. Each item was rated on a 5-point Likert scale ranging from 1 “not at all” to 5 “always”, with higher scores indicating higher hope. In this study, Cronbach's α, which refers to the internal consistency, was . 859.

3.3.4 Academic Achievement

The Academic Achievement Scale of College Students developed by Li Xianyin and Yang Na[21] was used in this study, and it contains 30 questions to assess students' learning cognitive ability, interpersonal communication capability, and self-management ability. Each item was rated on a 5-point Likert scale ranging from 1 “not at all” to 5 “always”, with higher scores indicating higher academic achievement. In this study, the Cronbach's α of the scale was .797.

3.3.5 Covariates

Among the personal characteristics that affect mediating variables and dependent variables, gender, grade, and residence were controlled during the analysis.

3.4 Data Analysis

Two statistical programs were used to analyze data in this study. SPSS PC+ Win.Ver.26.0 was used for frequency analysis, internal consistency analysis, and correlation analysis. To analyze the dual mediation effect, SPSS PROCESS Macro Ver.4.2 was used. Bootstrap was used to verify the significance level of the dual mediation effect, with the confidence interval set at 95% and the number of bootstrap samples set at 5,000.

4. Results

4.1 Correlation Between Four Variables

Pearson's correlation analysis was conducted to identify the association between the main variables, and the results are presented in [Table 1]. Learning motive had a positive association with major awareness (r=.624, p<.01), hope (r=.638, p<.01) and academic achievement (r=.539, p<.01). Major awareness had a positive correlation with hope (r=.710, p<.01) and academic achievement (r=.640, p<.01). And hope had a positive correlation with academic achievement (r=.628, p<.01). Meanwhile, the correlation coefficient between major awareness and hope was higher than .7, suggesting multicollinearity. Therefore, after performing a regression analysis with academic achievement as the dependent variable, and learning motive, major awareness, and hope as independent variables, VIF and tolerance for diagnosing multicollinearity were calculated. The tolerance was less than 1 for all independent variables and the value of VIF was less than 2, so it was judged that there was no mistake of multicollinearity[22].

Frequency analysis showed that the values of all variables were lower than the median value of .3. Hope had the highest average of 2.79, academic achievement average of 2.28, and learning motive average of 2.19, but awareness of major had the lowest at 1.89.

[Table 1] Analysis Results of Correlation and Frequency

	1	2	3	4
1. Learning motive	1			
2. Major awareness	.624**	1		
3. Hope	.638**	.710**	1	
4. Academic achievement	.539**	.640**	.628**	1
M	2.1875	1.8934	2.7924	2.2781
SD	.43461	.54038	.62588	.44513

**p<.01

4.2 Dual Mediating Effect

In order to determine the dual mediators' effect of major awareness and hope in the link between learning motive and academic achievement, model 6 of the SPSS PROCESS macro was utilized. In the analysis, a bootstrap confidence interval was set at 95% and the number of samples was set at 5,000. Gender, grade, and residence were controlled. Analysis results are presented in [Table 2] and [Fig. 2]

Learning motive had a significant influence on major awareness (.8601, p<.001), hope (.5490,

p<.001), and academic achievement (.4411, p<.001). Major awareness had a negative influence on hope (-.2644, p<.01) and a positive academic achievement (.3601, p<.001). Hope had a significant influence on academic achievement (.0805, p<.001).

The total effect was .7768 (.7011 ~ .8524), the direct effect was .4411 (.3459 ~ .5363), and the total indirect effect was .3356 (.2640 ~ .4217). All of the total effect, direct effect, and total indirect effect were significant as there was no zero between the upper and lower bootstrap values.

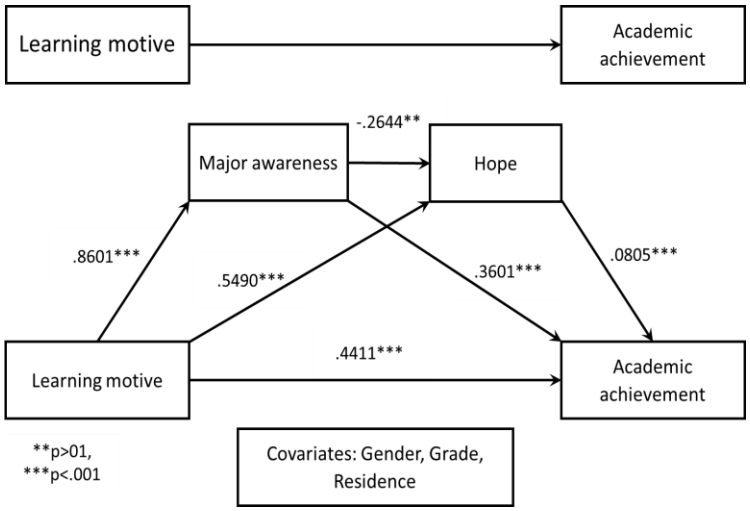
Indirect effects were verified using the bootstrap method. The indirect effect of major awareness was .3097 (.2419 ~ .3852), the indirect effect of hope was .0442 (.0123 ~ .0969), and the dual mediating effect of major awareness and hope was -.0183 (-.0439 ~ -. 0032), which was significant as there was no zero between the upper and lower bootstrap values.

[Table 2] Results of Analysis of Dual Mediating Effect of Major Awareness and Hope

Variables		Mediating variable model 1 (DV: Major awareness)			Mediating variable model 2 (DV: Hope)			Dependent variable model(DV: Academic achievement)		
		Coeffect	SE	t value	Coeffect	SE	t value	Coeffect	SE	t value
Constant		.2577	1402	1.8378	1.8023	.2225	8.1005***	.4386	.1089	4.0265***
Independent variable	Learning motive	.8601	.0482	17.8464***	.5490	.1034	5.3090***	.4411	.0484	9.1078***
Mediating variable1	Major awareness				-.2644	.0814	-3.2499**	.3601	.0373	9.6634***
Mediating variable1	Hope							.0805	.0233	3.4576***
Covariates	Gender	-.0241	.0387	-.6232	.1724	.0612	2.8162**	-.0348	.0279	.0133
	Grade	-.0180	.0148	-.9763	-.0725	.0291	-2.489*	.0274	.0133	2.0657*
	Residence	-.1412	.0485	-2.9095**	.1392	.0775	1.7960	-.0280	.0352	-.7964
Model Summary	R2	.5355			.1381			.6532		
	F	108.6431***			12.0497***			112.7293***		

Effects		Effect	SE	Confidence interval	
				LLCI	ULCI
Total effect		.7768	.0385	.7011	.8524
Direct effect		.4411	.0484	.3459	.5363
Total indirect effect		.3356	.0400	.2640	.4217
Indirect effect	Learning motive → Major awareness → Academic achievement	.3097	.0362	.2419	.3852
	Learning motive → Hope → Academic achievement	.0442	.0220	.0123	.0969
	Learning motive → Major awareness → Hope → Academic achievement	-.0183	.0105	-.0439	-.0032

***p<.001



[Fig. 2] Dual Mediators Effect of Major Awareness and Hope

6. Discussion and Conclusion

This study focuses on the learning motive, major awareness, hope, and academic achievement of stomatology-major students in higher vocational colleges. The discussion and conclusions of this study are addressed in this session.

First, correlation analysis of the main variables reveals a positive association between learning motive, major awareness, hope, and academic achievement. The previous results that the learning motive has a desirable effect on academic achievement[1] that the learning motive has a positive effect on major fitness[3], that the learning motive has a desirable relation with hope[14], and that hope has a positive effect on academic achievement[6] were consistent with the current study results. Therefore, in order to improve academic achievement, it is necessary to operate not only academic motivation but also a program for introducing departments to new students and a plan to increase major awareness by operating career programs for each grade. Also, a strategy to improve hope through a vision presentation to all students would be desirable.

Second, the dual mediation effect analysis showed that major awareness and hope double mediated in the link between learning motive and academic achievement. In addition, each of major awareness and hope simply mediated in the effect of learning motive on academic achievement, respectively. These results were in line with studies that showed that major awareness and hope were influenced by learning motive and affected academic achievement, although no research results consistent with previous studies could be found[1][3][14][6]. The significance of this result suggests that it is important to improve academic achievement by developing a program that combines major awareness and hope for students.

In conclusion, this study confirmed that academic achievement can be improved through learning motive, major awareness, and hope.

There are one or two limitations of this paper, the limitations were pointed out, and suggestions were made for future research. Due to the lack of prior research on major awareness, the presentation of theoretical grounds was insufficient. In follow-up studies, studies on major awareness and related variables need to be conducted together. Since this study was limited to students majoring in stomatology, follow-up concern needs to be conducted with students from various majors and universities.

Despite these limitations, this study has great significance in that it looked at various ways such as

major awareness and hope to improve academic achievement.

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