INFLUENCES OF KOREANMIDDLE SCHOOL STUDENTS' ACHIEVEMENT GOALS ON SELF-EFFICACY IN MATHEMATICS

[1]CHUNI WU, [2]DOEHEE AHN

Chung-Ang University
E-mail: [1]zjlswcn@outlook.com, [2]dahn@cau.ac.kr

Abstract - This study was to analyze the relationships among Korean middle school students' achievement goals and self-efficacy in mathematics. The final samples consisted of 343 middle school students in Korea. Results were as follows. First, the results indicated that male students had higher self-efficacy than female students. Second, students' achievement goals and self-efficacy in mathematics showed significant correlations among each other. Third, stepwise regression analysis showed students' task-approach goal and other-approach goal were both significant positive predictors of self-efficacy, and a self-avoidance goal was significant a negative predictor of self-efficacy.

Index Terms - Achievement goals, Self-efficacy, Mathematics, Middle school students, Korea

I. INTRODUCTION

Elliot and his colleagues (2011)separatedmastery goals into task-based and self-basedgoals and introduced the 3 × 2 model ofachievement goals. The new achievement goal model was developed as task, self, other goalsand the three categories werealso separated into approach and avoidance [1]. However, the study on the 3 × 2 achievement goals is sparsely investigated little in Korea. Komarrajuand Nadlerasserted that self-efficacy has a significant correlation with achievement goals[2]. Since mathematicshas been consideredvery important in the academic curriculum,investigating self-efficacy in the mathematicswill be valuable [3].Therefore, the purpose of this study was to explore the relationship between Korean students'3 × 2 achievement goals and self-efficacy inmathematics of middle school in Korea.

II. METHOD

A. Participants

A total of343students (140 males and 203 females) in four middle schools in Soul Korea participated in the study.

B. Measures

Achievement goals:

The present study adoptedElliot and his colleagues' 3 × 2Achievement Goals Scaleto translate into Korean to measure students' goalorientations[1]. Eighteen items on a five-point Likert scale were used to assess students' endorsement of task-approach goal, task-avoidance goal, self-approach goal, self-avoidance goal,other-approach goal andother-avoidance goal; each goal type was assessed by three items. Analysis of internal consistency in the present study yielded a Cronbach's Alphas of .86 for task-approach goal, .72 for task-avoidance goal, .86 for self-approach goal, .91 for self-avoidance goal,.86 for other-approach goal,and .91 for other-avoidance goal.

Self-efficacy:

The present study adopted Midgley and his colleagues'Self-efficacyScale of The Patterns of Adaptive Learning Survey scale to translated Korean to measure students' self-efficacy[4]. Six items on a five-point Likert scale were used to assess students' self-efficacy. Analysis of internal consistency in the present study yielded a Cronbach's Alphaof .91.

III. RESULTS

This study constructed a CFA(Confirmatory factor analysis) model comprising six latent variablesand corresponding items. This model is depicted in Figure 1. Following the model, the study fitted a CFA model to the data, and was within the recommendedranges:χ^2=341.73,df=120, p=.000, TLI= .937, CFI=.951,RMSEA=.074.

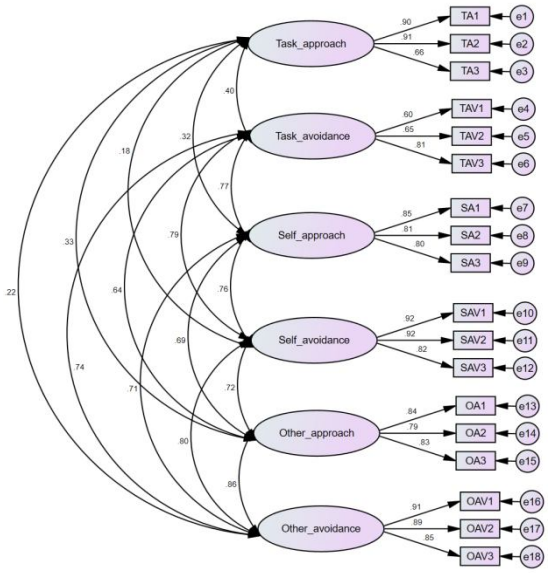

Fig. 1. CFA model testing criterion validity of the 3X2 achievement goals

The results of t-tests(Table 1) showed that the average task-approach scores of male students (M=3.50, SD= .92)were greater than those of female students (M= 3.25, SD= .97, t(343)= 2.360, p<.05). The average self-efficacy scores of male students(M=3.58, SD= .88)were greater than those of female students(M= 3.34, SD= .91),which reached the level ofsignificance (t(343)= 2.436, p<.05).

Variables		Male students		Female students		*t*
		M	*SD*	*M*	*SD*	
3X2 achievement goals	Task-approach goal	3.50	.92	3.25	.97	2.360*
	Task-avoidance goal	3.33	.98	3.30	.86	.287
	Self-approach goal	3.82	.99	3.85	.87	-.303
	Self-avoidance goal	3.56	1.16	3.53	1.00	.396
	Other-approach goal	3.52	.99	3.37	.98	1.377
	Other-avoidance goal	3.53	1.08	3.49	1.00	.331
	Self-efficacy	3.58	.88	3.34	.91	2.436*

***p<.05**

Table 1: Gender differences of 3 × 2 achievement goals and self-efficacy.

The correlations between variables are given in Table 2. Results indicated that achievementgoalswere positively associated with self-efficacyin mathematics. Specifically, task-approach goal (r=.52, p<.001), task-avoidance goal(r=.16, p<.001), self-approach goal (r=.25, p<.001),other-approach goal (r=.35, p<.001) and other-avoidance goal (r=.20, p<.001) were positively associated with self-efficacyin mathematics.

	variables	1	2	3	4	5	6	7
3X2 Achievement goals	1. Task-approach goal	-						
	2. Task-avoidance goal	.38***	-					
	3. Self-approach goal	.32***	.60***	-				
	4. Self-avoidance goal	.17**	.64***	.68***	-			
	5. Other-approach goal	.31***	.50***	.60***	.65***	-		
	6. Other-avoidance goal	.21***	.60***	.64***	.75***	.75***	-	
	7. Self-efficacy	.52***	.16***	.25***	.10	.35***	.20***	-

****p<.01, ***p<.001.**

Table 2: Correlations between variables

As can be seen in Table 3, for middle school students, perceived task-approach goal was the strongest predictor. The three predictors accounted for 33% of the variance in efficacy.Results indicated that task approach goal (β=.35, p<.001) and other-approach goal (β=.44, p<.001) positivelypredicted self-efficacy in mathematics, whereas self-avoidance goalnegatively predicted it (β=-.21, p<.001).

Variable	*B*	*S.E.*	*β*	R^2	$\triangle R^2$
Step 1					
Task-approach goal	.49	.04	.52***	.27	.27
Step 2					
Task-approach goal	.43	.05	.45***		
Other-approach goal	.20	.04	.21***	.31	.04
Step 2					
Task-approach goal	.42	.04	.44***		
Other-approach goal	.32	.06	.35***		
Self-avoidance goal	-.18	.05	-.21***	.33	.02

*****p<.001.**

Table 3:Stepwise Regression Analysis for 3X2 achievement goals in self-efficacy.

CONCLUSION

In this study, a confirmatory factor analysis was conducted on the achievement goal items and the fit statistics was found to meet the criteria for a good fitting model, indicating that this new achievement goal model could be adapted to Korean students. It was also shown that task-approach, other-approach, and self-avoidance influenced self-efficacy in mathematics. Therefore, these findings support the need to encourage the pursuit of task-approach and other-approach goals, and discourage the pursuit of a self-avoidance goal in mathematics of middle school students.

REFERENCES

[1] A. J.Elliot, K.Murayama, and R. Pekrun, "A 3×2 achievement goal model," Journal of Educational Psychology, Vol. 103. No.3.pp. 632-648, 2011

[2] M.Komarraju, and D.Nadler, "Self-efficacy and academic achievement: Why do implicit beliefs, goals, and effort regulation matter?" Learning and Individual Differences, Vol. 25. No. 3. PP. 67-72, 2013

[3] F. Pajares, andL. Graham, "Self-efficacy, motivation constructs, and mathematics performanceof entering middle school students," Contemporary Educational Psychology Vol. 24. PP. 124–139, 1999

[4] C. Midgley,M. L.Maehr, L. Z. Hruda, E.Anderman, L.Anderman, K. E.Freeman, and T. Urdan, "Manual for the patterns of adaptive learning scales," MI: University of Michigan. 2000

★★★