

The correlation between achievement goals, learning strategies, and motivation in medical students

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Purpose: The purpose of this study is to investigate the pursuit of achievement goals in medical students and to assess the relationship between achievement goals, learning strategy, and motivation.

Methods: Two hundred seventy freshman and sophomore premedical students and sophomore medical school students participated in this study, which used the Achievement Goals Scale and the Self-Regulated Learning Strategy Questionnaire.

Results: The achievement goals of medical students were oriented toward moderate performance approach levels, slightly high performance avoidance levels, and high mastery goals. About 40% of the students were high or low in all three achievement goals. The most successful adaptive learners in the areas of learning strategies, motivation, and school achievement were students from group 6, who scored high in both performance approach and mastery goals but low in performance avoidance goals. And goal achievement are related to the academic self-efficacy, learning strategies, and motivation in medical students.

Conclusion: In the context of academic achievement, mastery goals and performance approach goals are adaptive goals.

Key Words: Medical students, Achievement goals, Learning strategies, Motivation

INTRODUCTION

Goal achievement orientation is one aspect of motivation, assuming that achievement comprises personal pursuit, experience, and interpretation. Research on goal achievement usually relies on dichotomy assessment methods, resulting in the separation of students into either performance goal- or mastery goal-oriented groups. As a result, students who achieve high levels of mastery goals tend to have low performance goals, and

students who have high performance goal levels have low mastery goals [1].

This division recently has been re-examined, as new goal achievement theories and new research results have emerged [2]. In light of research results that have demonstrated that performance goals have positive effects on academic performance, an opportunity has been presented to revisit the performance goal, which has been viewed only as an inadaptible trait.

This study is interested in the so-called self-regulated learning strategy. We designated students who can pro-

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perly use the self-regulated strategy as 'self-regulated learners.' Self-regulated learners have various learning skills and strategies, know how to control themselves, and are very motivated. Some scholars use terms such as self-regulated learning strategy, self-regulated cognition, and self-directed learning instead of self-regulated learning.

There are many definitions of self-regulated learning. Many components of self-regulated learning are presented according to the scholars' interests or emphasis. We can categorize the components into three major factors: i.e., cognition-regulated factor, motivation-regulated factor, and behavior-control factor [3,4,5,6].

We use the term "self-regulated learning strategy," because this type of learning occurs strategically. In this study, we have included cognition-regulated strategy (surface, in-depth, metacognition), behavior control strategy (time management, seeking help, action control), and motivation-regulated strategy (academic self-efficacy, task value, intrinsic motivation), and take extrinsic and lack of motivation into account. We also tried to determine the tendency of medical students' goal achievement under the three-factor model and establish the relationship between the variables of multiple learning strategies and motivation.

This study aims to 1) analyze the medical student's goal achievement must be considered, and 2) explore the relationship between achievement goals, learning strategies, and motivation in medical student.

SUBJECTS AND METHODS

1. Subjects

Of 270 medical students (55 Year 1 premedical students, 96 Year 2 premedical students, 119 Year 2 medical

students) test results were used for the final analysis.

2. Instruments

1) Goal achievement orientation test

This test, which originally was designed by Elliott, consists of 18 items [7]. These items are subdivided into three groups—performance approach, performance avoidance, and mastery goal—each with six items. The original test used a Likert scale of 7 points, but we adopted a 6-point scale, in which "1" meant "Not at all" and "6" meant "Very much." The reliability scores of the test were 0.86 in performance approach, 0.79 in performance avoidance, and 0.76 in mastery goal.

2) Self-regulated learning strategy test

This test used Han's instrument in which the three-cognition-regulated strategy (surface, in-depth, metacognition), three-behavior-control strategy (time-management, seeking help, action control), and three-motivation-regulated strategy (academic self-efficacy, task-value, intrinsic motivation) including extrinsic and no motivation items were included to assess students' learning strategies [8]. The test used the aforementioned 6-point scale. The cognition-regulated strategy test consisted of 4 items on surface (demonstration) strategy, 7 items on in-depth (exquisiteness, structural) strategy, and 10 items on metacognition. The reliability scores were 0.67, 0.87, and 0.77, respectively. Behavior-control strategy test consisted of 5 items on time management, 6 items on seeking, and 5 items on action control. The reliability scores of these categories were 0.83, 0.77, and 0.85, respectively.

3) Academic self-efficacy

This category consisted of three subcategories: self-confidence, self-regulated efficacy, and task difficulty preference. Each subcategory had 4 items, resulting in a total of 12 items and a reliability score of 0.71. Task value consisted of 7 items, wherein 3 items asked the importance of learning, 2 items were on intrinsic value

or interest, and 3 items were on utility value. The task value category's reliability was 0.87.

4) Intrinsic motivation

This category primarily was focused on the reason for the students' enrollment at the school. Three subcategories— intrinsic, extrinsic motivation, no motivation had four items each, and the reliability scores were 0.83, 0.80, and 0.88, respectively.

5) Academic scores

Because the test was completed at the beginning of the semester, the academic scores that were used in this study were the scores from the previous semester. Premedical students, who had no academic scores from the prior year, were excluded in the analysis of academic scores.

3. Analysis

We used the SPSS statistics program version 20.0 (IBM Corp., Armonk, USA) to analyze means, standard deviation, frequency, Pearson r, t-test.

RESULTS

1. Medical students' goal achievement profile

The mean score (median) of goal achievement for

performance approach was 3.55 (3.67), 3.85 (4.00) for performance avoidance, and 4.32 (4.50) for mastery. Forty percent of students had either high or low tendencies in all three factors; 21.5% of students had low tendencies in all three factors, versus 20% toward high tendency (Table 1).

2. Learning strategy and motivation

As seen in Table 1, dividing three categories of goal achievement orientation into two levels (i.e., high or low) yields eight groups. Table 2 shows how these eight groups differ in various learning strategies, learning motivation, and academic scores. Group 6 (6.9%) had the highest total scores. This group, which had high performance approach and mastery levels and low performance avoidance levels, had the most ideal goal orientation. In contrast, according to the goal achievement theories, the least preferable group was group 3, which had low performance approach and mastery levels and a high level of performance avoidance. Students in group 3 had the lowest self-efficacy level and experienced difficulties in behavior control.

3. The relationship between goal achievement, learning strategy, and motivation

Performance approach goals had a correlation of 0.20 to 0.30 with cognition-regulated strategy (surface, in-

Table 1. Goal Achievement Profile (n=261)

Performance-approach	Performance-avoidance	Mastery	No.	%
Low	Low	Low	56	21.46
		High	40	15.33
	High	Low	22	8.43
		High	23	8.81
High	Low	Low	13	4.98
		High	18	6.90
	High	Low	37	14.18
		High	52	19.92

Median: Performance-approach 3.67, Performance-avoidance 4.00, Mastery 4.50.

Table 2. Mean Scores and Standardized Deviation of Learning Strategy, Learning Motivation, and Academic Scores by Goal Achievement Groups

Group*	Surface	Deep	Metacognition	Self-efficacy	Task-value	Intrinsic motivation	Time management	Seeking help	Behavior control	Academic score
1	3.91 (0.89)	3.69 (0.93)	3.60 (0.69)	3.75 (0.69)	3.56 (0.88)	3.24 (1.02)	3.36 (1.08)	3.66 (0.74)	3.32 (0.87)	81.32 (5.50)
2	4.26 (0.94)	4.33 (0.68)	4.07 (0.63)	4.03 (0.52)	4.60 (0.68)	4.43 (0.74)	3.41 (0.99)	4.15 (0.76)	3.74 (0.81)	83.11 (6.26)
3	4.40 (0.84)	3.75 (0.86)	3.79 (0.79)	3.36 (0.55)	4.01 (0.66)	3.63 (0.56)	3.48 (0.66)	3.79 (0.58)	3.05 (0.64)	79.96 (5.68)
4	4.57 (0.66)	4.10 (0.80)	4.02 (0.77)	3.72 (0.58)	4.37 (0.74)	4.07 (1.20)	3.40 (0.95)	4.43 (0.77)	3.43 (0.86)	78.81 (4.51)
5	3.96 (0.60)	3.71 (0.55)	3.46 (0.39)	3.72 (0.43)	4.30 (0.70)	3.92 (0.61)	3.11 (0.64)	3.77 (0.47)	3.38 (0.26)	84.61 (5.02)
6	4.89 (0.63)	4.53 (0.47)	4.44 (0.37)	4.38 (0.70)	4.98 (0.64)	4.64 (0.86)	4.06 (0.82)	4.58 (0.74)	3.91 (0.64)	85.21 (4.80)
7	4.41 (0.77)	4.01 (0.76)	4.06 (0.65)	3.61 (0.43)	4.07 (0.76)	3.45 (0.92)	3.65 (0.90)	3.83 (0.47)	3.44 (0.63)	83.43 (6.06)
8	4.84 (0.63)	4.32 (0.66)	4.26 (0.66)	3.60 (0.43)	4.75 (0.56)	4.26 (0.72)	3.76 (0.95)	4.37 (0.76)	3.32 (0.64)	82.52 (5.52)
Mean (SD)	4.39 (0.85)	4.06 (0.80)	3.97 (0.71)	3.75 (0.60)	4.27 (0.85)	3.89 (0.99)	3.54 (0.95)	4.05 (0.76)	3.43 (0.75)	82.15 (5.75)

SD: Standard deviation.

*Group 1: Performance-approach (Low)/Performance-avoidance (Low)/Mastery (Low), Group 2: Performance-approach (Low)/Performance-avoidance (Low)/Mastery (High), Group 3: Performance-approach (Low)/Performance-avoidance (High)/Mastery (Low), Group 4: Performance-approach (Low)/Performance-avoidance (High)/Mastery (High), Group 5: Performance-approach (High)/Performance-avoidance (Low)/Mastery (Low), Group 6: Performance-approach (High)/Performance-avoidance (Low)/Mastery (High), Group 7: Performance-approach (High)/Performance-avoidance (High)/Mastery (Low), Group 8: Performance-approach (High)/Performance-avoidance (High)/Mastery (High).

Table 3. Correlation between Goal Achievement, Learning Strategy, and Motivation Variables

Variable	Performance-approach	Performance-avoidance	Mastery	Academic score	No.	Mean	SD
Surface	0.28 [†]	0.26 [†]	0.34 [†]	0.30 [†]	270	4.40	0.86
Deep	0.23 [†]	0.07	0.44 [†]	0.29 [†]	270	4.08	0.81
Metacognition	0.30 [†]	0.16*	0.35 [†]	0.23 [†]	269	3.97	0.72
Time management	0.27 [†]	0.12*	0.14*	0.26 [†]	270	3.54	0.95
Seeking help	0.19 [†]	0.19 [†]	0.49 [†]	0.07	270	4.05	0.75
Behavior control	0.02	-0.10	0.24 [†]	0.23 [†]	270	3.42	0.75
Self-efficacy	-0.06	-0.35 [†]	0.33 [†]	0.20 [†]	268	3.76	0.59
Task-value	0.29 [†]	0.18 [†]	0.57 [†]	0.32 [†]	270	4.28	0.85
Intrinsic motivation	0.16 [†]	0.06	0.55 [†]	0.27 [†]	269	3.91	0.99
Extrinsic motivation ^{a)}	0.34 [†]	0.31 [†]	-0.05	-0.04	269	3.87	1.07
No-motivation ^{b)}	-0.10	-0.02	-0.30 [†]	-0.27 [†]	269	2.31	1.12
Performance-approach	-	0.59 [†]	0.29 [†]	0.22 [†]	262	3.55	1.04
Performance-avoidance		-	0.25 [†]	-0.04	270	3.85	0.91
Mastery			-	0.10	269	4.32	0.86
Academic score				-	195	82.31	5.83

SD: Standard deviation.

* $p < 0.05$, [†] $p < 0.01$.

^{a,b)}These are not motivation-regulated strategies but variable strategies that are important in the study.

depth, metacognition) and showed significant correlations with behavior control strategy (0.27) and seeking help (0.19), but no correlation was shown with behavior control (Table 3). Correlations with task value and

intrinsic motivation were 0.29 and 0.16, respectively. There was no significant correlation with self-efficacy. Performance approach and extrinsic motivation had the highest correlation (0.34). For performance avoidance,

there were positive correlations with surface strategy (0.26) and metacognition (0.16) but no correlation with in-depth strategy. Negative correlation scores were found with self-efficacy (-0.35). For the mastery goal, significant correlations were found with cognition-regulated (0.34-0.44) and behavior-control strategies (0.14-0.44); in particular, there were very high levels of correlation with motivation-regulated strategies (i.e., task-value, 0.55; intrinsic motivation, 0.57). Performance approach and performance avoidance goals had very strong correlations with extrinsic motivation, but mastery goal had no relation to extrinsic motivation and had a negative correlation with the no-motivation variable (-0.30). The variables of achievement goals showed strong correlation scores (0.25-0.59), especially between performance approach and performance avoidance (0.59).

DISCUSSION

Empirical research results of achievement goal theories have reported that students who have a high level of achievement goals prefer challenging tasks and use more effective learning strategies than students who have low achievement goals [8,9,10]. Recent reports on performance goal have shown that performance approach goals positively affect academic performance [11] and task value [9,12,13] and have positive correlations with academic self-concept. In contrast, the performance avoidance goal is a negative motivational phenomenon that negatively affects the learning process. Students who have a high level of performance avoidance goals tend to have low self-confidence, ineffective use of strategy, and learned helplessness and self-handicapping strategies [7,14].

The medical students' performance approach levels

were normal and had a slight tendency toward performance avoidance and very strongly oriented mastery goals. By dividing the three variables of the achievement goal into two levels, ultimately classifying them into eight groups, 40% of medical students were grouped into either very high or very low level groups of performance approach, performance avoidance, and mastery goal.

We examined correlation between goal achievement, learning strategy, learning motivation, and academic achievement. As a result, the mastery goal was the strongest relationship of learning strategy.

Based on the results of groups of students who have high levels of performance approach and mastery goals, those who have a low level of performance avoidance (group 6) use diverse learning strategies and have the best academic scores, and the mastery goal is the strongest predictive variable for learning strategy and motivation; such a result strongly suggests how medical students' parents and instructors should adjust students' achievement goals. Thus, instructors should closely observe students' achievement goal orientation and at the same time enhance performance approach goals or mastery goals and drop the level of performance avoidance goals.

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