

# Relationship between implicit theory of intelligence, 2\*2 achievement goals framework, self-regulating learning with academic achievement

## A casual model

Ali Delavar<sup>1</sup>, Hasan Ahadi<sup>1</sup>, Majid Barzegar<sup>2+</sup>

<sup>1</sup>Professor, department of psychology, science and research branch, Islamic Azad University, Tehran, Iran

<sup>2</sup> Phd candidate, department of psychology, science and research branch, Islamic Azad University, Tehran, Iran.

**Abstract.** The purpose of this research was to develop and test an expanded model of Dweck's social-cognitive theory of motivation. The model comprised implicit theories of intelligence (incremental theory and entity theory) achievement goals (mastery, performance-approach and -avoidance goals), study strategies (metacognitive, deep cognitive, surface cognitive and resource management strategies) and academic achievement in a mathematics and statistics course. To do this, 253 students from the faculty of psychology were chosen through multistage cluster sampling. They were assessed on achievement goal orientations, implicit beliefs, study strategies using questionnaires. Findings were generally consistent with Dweck's theoretical predictions. Mastery goals had a positive impact on learning strategies and academic achievement, while performance goals had a negative influence on learning strategies and academic achievement. In addition, the predicted effects of implicit theories of intelligence on goal orientation and study strategies were confirmed. In addition, results showed that achievement goals and study strategies have a mediating role between implicit theories of intelligence beliefs and academic achievement.

**Keywords:** implicit theories of intelligence, achievement goals, self-regulating learning, *academic achievement*.

## 1. Introduction

Dweck's (1986; Dweck & Leggett, 1988) social-cognitive theory of motivation has attracted a great deal of attention since the past two decades. The key concepts of this model are beliefs (implicit theories) that learners hold on the nature of intelligence and learners' goal orientation. Dweck contrasts two types of implicit theories of intelligence: the belief that intelligence is a malleable and controllable quality, an incremental theory, and the belief that intelligence is a fixed and uncontrollable trait, an entity theory. The main postulate of this model is that implicit theories of intelligence determine the way students approach learning and achievement situations, the kinds of goals they adopt, and through the mediation of effort expenditure and persistence, their achievement (Dupeyrat and Mariné, 2005). According to Dweck, it seems that beliefs about the nature of intelligence have a very powerful impact on behaviour. These implicit theories of intelligence create a meaning system or conceptual framework that influences the individual interpretation of school situations. Thus, an entity theory of intelligence is the belief that intelligence is a fixed trait, a personal quality that cannot be changed. Students who subscribe to this theory believe that although people can learn new things, their underlying intelligence remains the same. In contrast, an incremental theory of intelligence is the belief that intelligence is a malleable quality that can increase

---

<sup>+</sup> Corresponding author. Tel.: + (989173111060); fax: +(987116287643).  
E-mail address: (mbarzegar55@yahoo.com).

through efforts. The identification of these two theories allows us to understand the cognition and behaviour of individuals in achievement situations. Many studies carried out in the academic area show that students who hold an entity theory of intelligence (i.e. they consider intelligence like a stable quality) have a strong tendency to attribute their failures to a fixed trait. They are more likely to blame their intelligence for negative outcomes and to attribute failures to their bad intellectual ability. In contrast, students who hold an incremental theory of intelligence (ie they consider intelligence as a malleable quality) is more likely to understand the same negative outcomes in terms of specific factors: they attribute them to a lack of effort. This differential emphasis on traits versus specific mediators in turn fosters different reactions to negative events. Several studies have shown that entity theorists of intelligence are more likely than incremental theorists to react helplessly in the face of failure. They are not only more likely to make negative judgments about their intelligence from the failures, but also more likely to show negative affect and behaviours.

Achievement goals are defined as the goals or purposes that motivate students within the academic setting ( Wolters, 2004).

Much of the literature on achievement goals focuses on the distinction between mastery goals and performance goals. Specifically, students who adopt mastery goals (i.e., learning goals) are motivated to understand the material and develop their skills. On the other hand, students who adopt performance goals are concerned with comparing themselves with others. These students evaluate their ability in relation to others in order to determine their self-worth; that is, they are concerned about being judged based on their performance (Ames, 1992 ; Ames & Archer,1998).

In addition to this distinction, mastery and performance goals are related to different patterns of learning. Mastery goals are associated with a number of positive learning strategies and attributes; for example, the belief that effort leads to success, a preference for challenging work, interest and positive attitudes toward learning, increased time on tasks, persistence, liking the class, and effective learning and problem-solving strategies (Ames, 1992 ; Ames & Archer,1998). Conversely, performance goals are associated with avoidance of challenging tasks, the belief that one lacks ability in the face of failure, and the use of superficial learning strategies (Ames,1992 ; Ames & Archer,1998).

Building on the dichotomy of mastery and performance goals, Elliot and McGregor proposed a more complex conceptualization of achievement goals to incorporate approach and avoidance orientations into a 2X2 framework [Elliot & McGregor, 5]. That is, they described achievement goals in terms of competence, and the outcome can either be a desirable possibility (i.e., success) or an undesirable possibility (i.e., failure) [Elliot & McGregor, 5]. Thus, when a student adopts an approach orientation, they are expecting success, whereas a student who expects failure adopts an avoidance orientation. Following this 2X2 framework, a *mastery-approach* (MAP) goal orientation is manifested in a student's desire to learn as much as possible, to be persistent, and develop their skills. A student who fears losing skills and the inability to master all the material defines a *mastery-avoidance* (MAV) goal orientation. Students who exhibit a *performance-approach* (PAP) goal orientation compare themselves with others and are motivated by their desire to demonstrate their ability and achievements publically. Finally, a *performance-avoidance* (PAV) goal orientation describes a student who does not want to appear incompetent or lacking in ability relative to others ( Wolters, 2004).

In addition to these four goal orientations, a fifth orientation has been suggested and is included in our study. A *work-avoidance* (WAV) orientation describes a student that tries to do as little work as is necessary to get by (Pieper,2009).

Fewer studies have tested the relationships between implicit theories of intelligence and goal orientation in an academic context. The few studies that did so could only partially support Dweck's postulates. Roedel and Schraw (1995), for example, found that the endorsement of an entity theory of intelligence was related to the pursuit of performance goals, but that it was unrelated to the pursuit of mastery goals (i.e., students whose dominant goal was one of progressing and acquiring new knowledge did not reject the belief that intelligence is a fixed entity). To the contrary, in two other studies (Dupeyrat & Escribe, 2000; Dupeyrat & Mariné, 2001) the belief in a fixed entity was not associated with performance goals but was negatively correlated with mastery goals.

The main purpose of the present study is to test a model derived both from Dweck’s theoretical postulates and the empirical findings reported above using path analysis.

The theoretical model tested in this study, as illustrated in Fig. 1, examines the relationships between implicit theories of intelligence and goal orientation, and the influence of these First-year psychology students (N=952; 652 female and 300 male) cooperated in this study,

Participating in a number of collective test sessions within the framework of study

Obligations’ two sets of variables on measures of students’ learning strategies in learning and achievement.

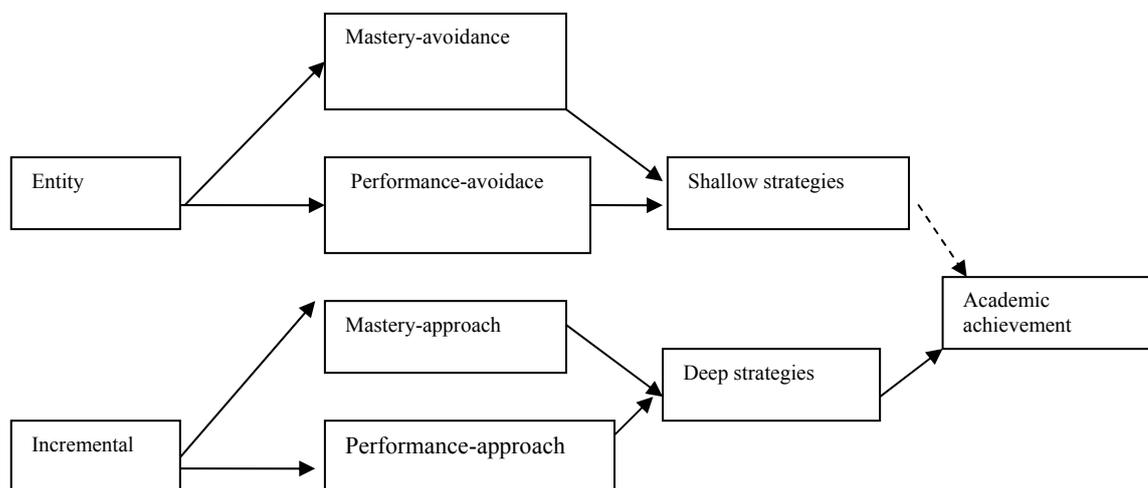


Fig.1. Proposed causal model for explaining achievement. Solid lines depict positive relations; and dotted lines depict negative relations

## 2. Method

First-year psychology students (N=260) cooperated in this study, they were assessed on the *implicit theories of intelligence* subscale (Sabry M. Abd-El-Fattah Greg ,Yates.2010 ), achievement goal orientations questionnaire(elliott &mcgregor,1994) and Motivational Strategies for Learning Questionnaire (MLSQ; Pintrich & DeGroot, 1990; Pintrich, Smith,Garcia, & McKeachie, 1993 ).

## 3. Results

Relations between variables were examined with Pearson product–moment correlations between variables (Table 1).

variables	1	2	3	4	5	6	7	8	9
1.entity	1								
2.incremental	-.48	1							
3.Mastery-avoidance	.38	-.12	1						
4.performance-voidance	.42	-.23	.03	1					
5. Mastery-approach	-.52	.39	.21	.05	1				
6.Performance-approach	-.42	.28	.12	.18	.21	1			
7. Shallow strategies	.36	.04	.32	.33	-.18	-.15	1		
8. Deep strategies	-.23	.28	-.24	-.21	.24	.25	-.33	1	
9. Academic achievement	-.36	.22	-.18	-.27	.17	.31	.24	.45	1

Mastery-approach goals were positively correlated with the incremental theory and negatively correlated with the entity theory of intelligence and negatively correlated with shallow strategies and positively with

deep strategies and academic achievement. Mastery-avoidance goals were negatively correlated with the incremental theory and positively correlated with the entity theory of intelligence and positively correlated with shallow strategies and negatively with deep strategies and academic achievement.

Performance-approach goals were positively correlated with the incremental theory and negatively correlated with the entity theory of intelligence and negatively correlated with shallow strategies and positively with deep strategies and academic achievement. performance-avoidance goals were negatively correlated with the incremental theory and positively correlated with the entity theory of intelligence and positively correlated with shallow strategies and negatively with deep strategies and academic achievement.

The results of path analysis revealed that the proposed model is relatively well-fitted with the present study's data and can explain 36% of academic achievement variance. RMR was 2.13, GFI was .92, CFI .97 and NFI was .98.

#### 4. Discussion

Concerning the relations between implicit theories of intelligence, goal orientation, and learning, our results only partially validated Dweck's model. Contrary to Stipek and Gralinski (1996) who found that performance goals were positively related to an entity theory of intelligence, in our study neither an entity nor an incremental theory were significantly related to performance goals. Though correlations between both implicit theories and mastery goals were significant and in the expected direction, the results from the path model indicated that an entity theory, but not an incremental theory, was a significant, negative, predictor of mastery goals. That is, in our sample, students tended to pursue mastery goals when they rejected the belief that intelligence is fixed, but not necessarily when they believed their intelligence is malleable and controllable. our path model indicated that performance goals were the only predictors of shallow-processing and that they did not contribute significantly to the variance of deep-processing strategy use after controlling for mastery goals and work avoidance. The links between both deep- and shallow-processing strategies and achievement were not significant. Although this is contrary to the assumption that deep-processing is positively related and shallow-processing is negatively related to academic performance, other studies also found these strategies were only weakly related or unrelated to achievement measures (e.g., Elliot et al., 1999)

Future research may further extend Dweck's model by also considering the role of other motivational mediators or covariates such as for example interest, achievement motivation, or self-concept revealed as important determinants of learning behaviour and outcome in other studies (e.g., Elliot, 1999; Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002).

#### 5. References

- [1] Ames, C., "Classrooms: Goals, Structures, and Student Motivation", *Journal of Educational Psychology*, American Psychological Association, 1992, 261-271.
- [2] Ames, C. & Archer, J., "Achievement Goals in the Classroom: Students' Learning Strategies and Motivation Processes", *Journal of Educational Psychology*, American Psychological Association, 1988, 260-267.
- [3] Anderman, E. M., & Young, A. J. (1994). Motivation and strategy use in science: Individual divergences and classroom effects. *Journal of Research in Science Teaching*, 22, 269-298.
- [4] Archer, J. (1994). Achievement goals as a measure of motivation in university students. *Contemporary Educational Psychology*, 19, 430-446.
- [5] Dupeyrat, Caroline and Claudette Mariné, Implicit theories of intelligence, goal orientation, cognitive engagement, and achievement: A test of Dweck's model with returning to school adults. *Contemporary Educational Psychology* 30 (2005) 43-59.
- [6] Dweck, C. S. (1986). Motivational processes affecting learning. *American Psychologist*, 41, 1040-1048.
- [7] Dweck, C. S. (1996). Implicit theories as organizers of goal and behavior. In P. M. Gollwitzer & J. A. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 69-90). New York: The Guilford Press.
- [8] (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 69-90). New York: The Guilford Press.
- [9] Dweck, C. S., Chiu, C., & Hong, Y. (1995). Implicit theories and their role in judgments and reactions: A

- [11] world from two perspectives. *Psychological Inquiry*, 6, 267–285.
- [12] Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review*, 95, 256–273
- [13] Pieper, S. L., “Refining and Extending the 2 x 2 Achievement Goal Framework: Another Look at Work-Avoidance.”, Psy.D. dissertation, James Madison University, United States–Virginia, 2003. Retrieved November, 19, 2009, from ProQuest Digital Dissertations database. (Publication No. AAT 3117515).
- [15] Wolters, C. A., “Advancing Achievement Goal Theory: Using Goal Structures and Goal Orientations to Predict Students’ Motivation, Cognition, and Achievement”, *Journal of Educational Psychology*, American Psychological Association, 2004, 236-250.