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Revisiting the trichotomous achievement goal framework for Hong Kong Secondary Students: A structural model analysis¹

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Abstract

Recent studies in the late 1990s have led researchers to argue that performance goals can be split into performance-approach and performance-avoidance goals and that performance goals are not totally maladaptive in learning. Research of the trichotomous goals framework by Elliot, McGregor and Gable (1999) found that mastery goals are positive predictors of deep processing, performance-approach goals are positive predictors of surface processing and exam performance, and performance-avoidance goals are positive predictors of surface processing and negative predictors of deep performance and exam performance. The present study examined a structural model outlining the relationships of the three achievement goals, learning strategies and achievement of Hong Kong secondary students. The model was confirmed by LISREL8.5 for Windows with satisfactory goodness of fit index. The results showed that mastery goals were significantly and positively related to deep strategy but negatively related to surface strategy in learning. Both performance-approach and performance-avoidance goals were significantly related to surface strategy. Both mastery goals and performance-approach goals were significantly and positively related to academic achievement but performance-avoidance goals were significantly and negatively related to achievement.

Key words: mastery goals, performance-approach goals, performance-avoidance goals, surface strategy, deep strategy, achievement

Introduction

The significant influence of achievement motivation on learning has been well documented in literature. In the achievement goal theory, two goals are posited viz. mastery and performance goals and their impacts on learning have been intensively researched. Mastery goals are also known as learning or task goals and performance

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goals are also known as ego goals. Individuals holding mastery goals are motivated to comprehend and master knowledge and skill while those who are performance-goal oriented either tend to demonstrate their ability excellence over others or conceal their weakness (Ames, 1992; Archer, 1994). Many of the research findings have found that persons carrying mastery goals adopt deep learning strategies or elaboration process in learning while persons who are performance-goal oriented tend to be associated with surface strategy or rehearsal process in learning (Albaili, 1998; Bandalos, Finney & Geske, 2003). Individuals holding mastery goals tend to seek challenges and improve themselves, they spend effort in learning and understanding of materials and make use of effective learning strategies, and they are reported to exhibit more positive attitudes toward school, and have a higher level of self-efficacy than those who pursue performance goals (Mattern, 2005; Middletown & Midgley, 1997; Pintrich, 2000; Wolters, 2004). Subsequently, researchers in the past often concluded that mastery goals are adaptive and performance goals are maladaptive in learning (Pintrich, & Schunk, 2000).

However, recent studies on achievement goals in the late 1990s have produced inconsistent findings, particularly with performance goals. While mastery goals are found to associate with deep processing, performance goals are sometimes found to associate with both surface and deep processing (Chan, Lai, Leung & Moore, 2005). Several studies indicated the maladaptive nature of performance goals (Urdan, 2004), however, other studies showed no relation or positive relation to learning outcomes, suggesting more studies should be done to determine if performance goals are beneficial or disadvantageous to student learning and in what situations (Midgley, Kaplan, & Middleton, 2001). In terms of the relation between achievement goals and academic achievement of students, again varied findings were reported. In a study of African American students, Gutman (2006) found mastery goals may be more influential in determining achievement and motivation in mathematics than are performance goals during high school transition. Other studies showed no relation between mastery goals and academic achievement, instead performance goals were found to relate to academic achievement or exam results (Elliot, McGregor & Gable, 1999; Greene, & Miller, 1996). In other words, performance goals are not necessarily maladaptive in learning and lead to good achievement. Subsequently, researchers doubted about the validity of the traditional dichotomous goals theory to explain for the full facets of learning. They argued that performance goals might be split into two separate goals labeled performance-approach and approach-avoidance goals. The dichotomous classification of goals theory was turned to a trichotomous goals framework (Elliot, 1997, 1999; Harackiewicz, Barron, & Elliot, 1998; Harackiewicz, Baron, & Pintrich, 2002). Similarly, mastery or learning goals could further be split

into two goals, the mastery-approach and mastery-avoidance goals but the tetrachotomous goals hypothesis or framework has seldom been tested and validated.

So far, many of the achievement goals research were centered on the dichotomy goals theory (e.g. Roedel, Schraw, & Plake, 1994) and studies on the trichotomous goals framework were not plentiful and the studies were conducted mainly in North America and sparse findings were reported for non-Western countries including the Chinese culture. Among the studies on trichotomous goals framework, they started to develop scales to measure the three goals (Finney, Piper, & Baron, 2004; Midgley et al., 2001); and their impact of the three achievement goals in learning, examining the relationships of the goals with different constructs, such as persistence, learning strategies, effort and achievement the often cited literatures come from the work of Elliott and his colleagues, (e.g. Elliot, 1999; Elliot & Church, 1997; Urdan, 2004; Vermunt, & Vermetten, 2004; Wolters, 2004). Research of the trichotomous goals framework by Elliott (1999) found that mastery goals are positive predictors of deep processing, performance-approach goals are positive predictors of surface processing and exam performance, and performance-avoidance goals are positive predictors of surface processing and negative predictors of deep performance and exam performance. Although the splitting up of performance goals into performance-approach and performance avoidance goals has done much to clarify the results associated with performance goals, it has not yet settled the debate regarding the effects of performance-approach goals as more papers have generated results regarding the beneficial and harmful effects of pursuing performance-approach goals (Urdan, 2004). This implies more research is needed to study the effects of performance-approach goals versus performance-avoidance goals and in comparison with the effects of mastery goals in student learning.

In addition, studies by Midgley et al., (2001) suggested that the benefits of performance-approach goals may not apply to all students equally and that there may be cultural differences for students in the pursuit and consequences of performance-approach goals and this area has not be adequately researched (Urdan, 2004). In fact, to what extent the trichotomous goals theory are applicable in the Chinese culture and what are the effects of performance-approach goals and performance-avoidance goals in Chinese students' learning are worth investigating. Therefore, the present study proposed a structural model outlining the relationship of the three achievement goals, learning strategies and achievement of Hong Kong secondary students. The structural model was tested with the use of LISREL 8.5 for Windows.

Aim of the Study

This study aims to explore the interrelationships of mastery goals, performance-approach goals, performance-avoidance goals, learning strategies and achievement of Hong Kong secondary school students. A structural model was proposed with paths drawn to illustrate the relations among the variables. In the model, mastery goals, performance-approach and performance-avoidance goals were taken as the predictor variables and learning strategies and academic achievement as dependent variables. The model was tested by structural equation modeling and path analysis. Based on the meaning of mastery and performance goals and the notion from literature that mastery goals are adaptative and performance goals are maladaptive in student learning, four hypotheses were proposed to be tested by a structural model to be validated by confirmatory factor analysis with LISREL 8.5 for Windows. First, it was hypothesized that mastery goals are positive predictors of deep strategy and academic achievement (H1); second, performance-approach goals are positive predictors of deep strategy and academic achievement (H2); third, performance-avoidance goals are positive predictors of surface strategy but negative predictors of academic achievement (H3); and fourth, deep strategy positively predicts academic achievement and surface strategy negatively predicts academic achievement (H4).

Method

A self-reported questionnaire consisting of several scales (see section "Instrument" below) was administered to a sample of secondary students on voluntary basis to examine the achievement goals and learning strategies they adopted. Consent was sought from the school heads and parents before the students participated in the study. The questionnaires were distributed to the students for completion in class. In completing the questionnaire, students were also asked to supply their demographic information and report their last exam results in different categories of academic achievement.

Participants

The participants comprised 1381 secondary students from three schools, of which 786 (56.9%) were male and 595 (43.1%) were female. In terms of grade level, 735 (53.2%) were junior secondary students (Form 1 to Form 3) and 646 (46.8%) were senior secondary students (Form 4 to Form 7). Five categories of academic achievement were provided for students to fill in for their exam results: low, middle-low, middle, middle-high and high. From the responses, it was found that 121 (8.8%) were low, 298

(21.6%) were middle-low, 506 (36.6%) were middle, 332 (24.0%) were middle-high and 124 (9.0%) were high in academic achievement.

Measuring Instruments

The following questionnaires or scales were used to assess the achievement goals and learning strategies.

Achievement goals: The questionnaire to measure achievement goals was adapted from the Achievement Goal Questionnaire (AGQ) developed by Elliot and Church (1997). The AGQ consists of three subscales: mastery goals (6 items), performance-approach goals (6 items) and performance-avoidance goals (6 items) rated on a 7-point Likert scale. The reported reliability alphas for the measures of mastery, performance-approach and performance-avoidance goals were respectively .89, .91 and .77 based on a study of a sample of 204 undergraduates enrolled in a psychology course at the University of Rochester. Illustrative examples of items included “It is important for me to understand the content of this course as thoroughly as possible” (*mastery goals*), “It is important to me to do better than the other students” (*performance-approach goals*) and “I just want to avoid doing poorly in this class” (*performance-avoidance goals*). To minimize the total number of items used in the present study, 5 items each from the subscales of mastery, performance-approach and performance-avoidance goals were used, rated on a six-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree). The items were selected according to the face/content validity of the items and consensus of a panel of 3 lecturers who are experienced in teaching educational psychology in both Chinese and English courses in a Hong Kong university. The subscale items were then translated into the Chinese version, moderated and vetted by the panel members until consensus were reached that the contents between the English and Chinese versions matched in meaning. Confirmatory factor analysis of the three subscale items were then conducted, all showing goodness of fit index greater than .90, which was considered good enough for further analysis (Bentler, & Bonnett, 1980). Reliability alphas of the mastery, performance and performance-avoidance goals in the present study were .78, .86 and .66 respectively, acceptable for the study (Nunnally, 1978).

b) **Learning strategies:** Biggs’ Revised Two-factor Study Process Questionnaire (R-SPQ-2F, Biggs, Kember & Leung, 2001) was used. The questionnaire consists of deep motive (5 items), deep strategy (5 items), surface motive (5 items) and surface strategy (5 items) rated on a five-point Likert scale. The scale was developed and validated from the Biggs’ Study Process Questionnaire (SPQ) and the revised scale was claimed to be an improved version to measure learning strategies adopted by students. The reported reliability alphas of the deep strategy and surface strategy in

the questionnaire (R-SPQ-2F) were .63 and .57 respectively. In the present study, only the deep and surface strategy items (5 items each) were used and rated on a six-point Likert scale, ranging from 1 (strongly disagree) to 6 (strongly agree). Illustrative examples of items included “I find that I have to do enough work on a topic so that I can form my own conclusion before I am satisfied” (*deep strategy*) and “I learn some things by rote, going over and over them until I know them by heart even if I do not understand them” (*surface strategy*). The subscale items of deep strategy and surface strategy were translated to Chinese, moderated and vetted by the same panel members until consensus were reached that the contents of the English and Chinese versions matched in meaning. Confirmatory factor analysis of the subscale items were conducted, followed by reliability analysis. Confirmatory factor analysis of the deep and surface strategy subscale items also showed goodness of fit index above .90, the reliability alphas of the deep and surface strategy subscales for the present study were .75 and .66 respectively, the psychometric properties support the use of the two strategy subscales in the present study.

Preliminary analysis of subscales

As reported in the “Instruments” section, preliminary confirmatory factor analysis followed by reliability analysis were conducted to validate the adopted scales and subscales in the measurement of achievement goals and learning strategies; and it was found that the adopted scales and subscales were acceptable for the present study.

To further improve the scales used in the present study, items with factor loading less than .45 were deleted from the subscales of mastery goals, performance-approach goals, performance-avoidance goals, deep strategy and surface strategy in the path analysis of the proposed structural model.

Path analysis of the structural model

A structural model was proposed to be tested in the path analysis. In the model, it was hypothesized that mastery goal, performance-approach goals and performance-avoidance goals had a direct effect on academic achievement as well as an indirect effect on academic achievement, mediated by the learning strategies (deep and surface) adopted by the students in learning. The model was tested with confirmatory factor analysis using LISREL 8.5 for Windows to examine the fitness of the input data into the proposed model. The path coefficients computed from path analysis reflected the magnitude of relation or predictor effects of the achievement goals (mastery, performance-approach and performance-avoidance goals) on learning strategies (deep and surface) and academic achievement. As well, it also showed the relations of the two learning strategies with academic achievement.

Results

Figure 1 shows the results of path analysis. The diagram shows the estimated standardized coefficients for the paths linking the three goals of achievement motivation, the two learning strategies and academic achievement. The path coefficients which are asterisked are significant at .05 level. The model achieves an overall good fit with the GFI = .96, AGFI = .94, NNFI = .94, CFI = .96, RMSEA = .052, RMR = .073. This implies that the pattern of relationships taken as a whole as hypothesized by the model fits the data well.

In Figure 1, it shows that mastery goals had positive and significant influence on deep strategy (path coefficient = .80) but not on academic achievement. The magnitude of the influence on deep strategy from mastery goals was very strong. Although positively related to academic achievement, the magnitude of relation with mastery goals was weak and insignificant. Performance-approach goals had positive and significant predictor effects on surface strategy (path coefficient = .16) and academic achievement (path coefficient = .24), the magnitude were from moderately weak to moderate. Performance goals had positive but insignificant predictor effect on deep strategy and the relation was very weak (path coefficient = .03). Performance-avoidance goals were significantly and moderately related to surface strategy (path coefficient = .43), performance-avoidance goals had a negative effect on academic achievement ((path coefficient = - .34). There were no significant influence of deep strategy (path coefficient = .14) and surface strategy (path coefficient = .08) on academic achievement and the magnitude of path coefficients were weak to very weak respectively.

Discussion

This study seeks to analyze the interrelationships among achievement goals (as indicated by the three factors: mastery goals, performance-approach goals and performance-avoidance goals, learning strategies (as measured by the deep and surface learning strategies) and academic achievement. It was hypothesized that the different achievement goals held by teacher education students have direct influence on their learning strategies they adopt and in turn their academic achievement. Also, it was expected that the three achievement goals would exert direct influence on the student academic achievement. The specific relations among the variables, viz. achievement goals, learning strategies and academic achievement were hypothesized in the “Aims of study” section, to be validated by the path analysis of the proposed structural model.

Analysis of the results shows the four hypotheses were supported. That is,

mastery goals are positive predictors of deep strategy and academic achievement (H1); performance-approach goals are positive predictors of deep strategy and academic achievement (H2); performance-avoidance goals are positive predictors of surface strategy but negative predictor of academic achievement (H3) and deep strategy positively predicts academic achievement and surface strategy negatively predict academic achievement (H4). In particular, mastery goals are found to exert a strong to very strong predictor influence on mastery strategy; performance-avoidance goals had moderate predictor influence on surface strategy and academic achievement, and that the relation with academic achievement was negative, supporting the assumption or notion that performance-avoidance goals are maladaptive in learning.

In this study, it was interesting and unexpected to find performance-approach goals had only very weak predictor effect on deep strategy and that performance-avoidance goals were positively related to deep strategy although the relation was insignificant and that they were very weakly related. Meanwhile performance-approach goals were positively and significantly related to academic achievement and that mastery goals had no significant influence on academic achievement. The relations are understandable when we consider the meaning of performance-approach goals and mastery goals. Student holding performance-approach goals intend to demonstrate their ability and outperform others in examinations and assessments. They would adopt either the deep or surface strategy and in some instance, even both the deep and surface strategies as long as the strategies enable them to achieve a good result. This may explain why in the present study performance-approach goals did not exert a significant and strong predictor effect on deep strategy as one might expect. Meanwhile the significant relation between performance-approach goals and surface strategy might be a reflection of the learning contexts and the nature of assessments that cause the students to pursue with surface strategy if the strategy works in exam and enables them to perform well above the others. Though significantly related, the small magnitude of the path coefficient indicates the relation was not strong, unlike those with performance-avoidance goals. Parallel to this, students holding mastery goal intend to improve their competency, understanding in learning and mastery of skills rather than to demonstrate their ability or performance above the others, subsequently students holding mastery goals would adopt the deep strategy, which would improve their academic achievement but might not be at a significant level, depending on the type of examination or assessment tasks. All in all, the results can be interpreted that the more intrinsically motivated the students are, the more likely they would adopt the deep learning strategy and the less likely they would adopt the surface learning strategy. In contrast, students holding performance-avoidance goals are likely not intrinsically motivated and are greatly

inclined towards using the surface strategy, hoping this would help them to pass the examination and assessment.

In conclusion, the results of the findings support the expectation about the relationships between achievement motivation, learning strategies and academic achievement. The results generally resemble the findings reported in literature about the nature and influence of achievement goals: mastery, performance-approach and avoidance goals on learning. Instead of simply categorizing achievement goals into two, the trichotomous achievement goal framework are found better to explain student learning and achievement. In the past, the traditional dichotomy theory of achievement goals stated that mastery goals are adaptive and performance goals are maladaptive in learning. The dichotomy goal theory is difficult to account for the controversial findings associated with performance goals in different studies. The trichotomous achievement goal framework help explain the varied results due to the different nature of performance-approach and performance-avoidance goals. It is the performance-avoidance goals which are associated with surface strategy and exerted a negative influence on academic achievement that would be described as maladaptive in learning. On the other hand, performance-approach goals are associated with both surface and deep strategies and exert a positive influence on academic achievement, thus explaining why in some studies, performance goals are not maladaptive as previously assumed.

In the present study, path analysis of the proposed structural model well demonstrate and support the hypothesized relations of the variables. The closeness of the findings in the present study with that reported in literature for the Western culture (mainly North America) did lend support to the validity of the trichotomous achievement goal framework and its applicability to explain student learning in the Hong Kong cultural context.

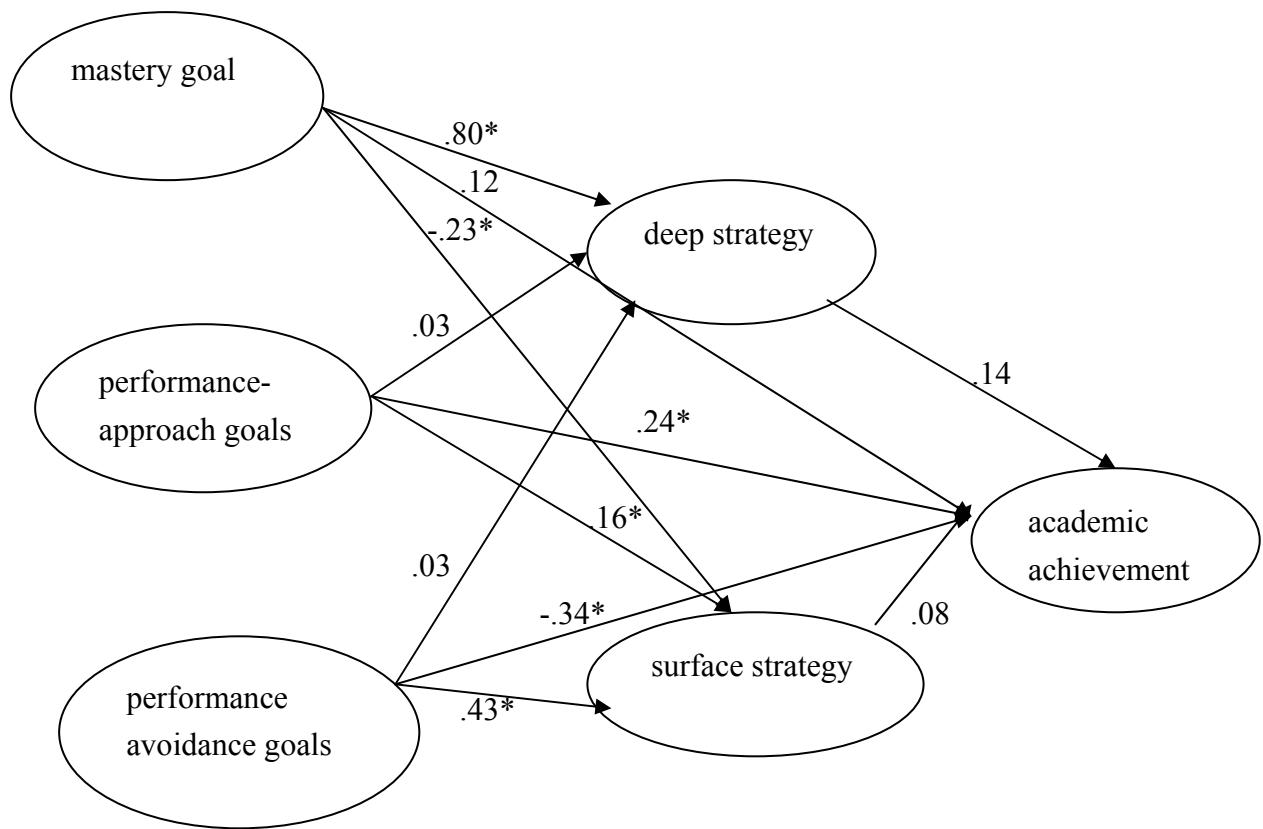
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Figure 1 Path analysis of a structural model of achievement goals, learning strategies and academic achievement with standardized estimates of path coefficients



* p <.05