**Examining the construct validity of Thai version of the 2 x 2 Achievement goal orientation scale in undergraduate students**

**Introduction**

Over the past two decades, the concept of achievement goal orientation has been helpful in understanding how individual approaches and engages in academic and learning tasks. Initially, achievement goal orientations were conceptualized in terms of a mastery-performance distinct orientation toward contrasting in achievement behavior: a mastery goal focused on improving abilities and developing competencies, and performance goal focused on the demonstration of competence to perform and to prove ability ([Ames & Archer, 1988](#_ENREF_1); [Dweck & Leggett, 1988](#_ENREF_8); [Elliot, 2005](#_ENREF_9); [Nicholls, 1984](#_ENREF_16)). In addition to the traditional mastery-performance distinction, the performance goal has been dichotomized to approach and avoidance dimension. The approach-performance dimension refers to outperforming others, desiring to demonstrating ability, and wanting to achieve a superior performance, whereas avoidance-performances refers to avoiding failure, looking incompetent and judging low ability ([Elliot & Church, 1997](#_ENREF_10); [Elliot & Harackiewicz, 1996](#_ENREF_11)).

More recently, according to a further revision on achievement goal theory, Elliot and McGregor ([2001](#_ENREF_12)) proposed a 2 x 2 achievement goal framework (consisted of mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance), which they applied the approach-avoidance distinction to mastery goals ([as cited in Sideridis, 2008](#_ENREF_19)). In this model, they re-categorized mastery as mastery-approach, and proposed the pattern for mastery-avoidance goals. Mastery-avoidance goals are the focusing on avoiding a failure to develop competence or avoiding task-related incompetence.

However, despite the four-factor conceptualization (2 x 2 achievement goal framework) was introduced by Elliot and McGregor over the past decade, a number of studies have been conducted on a trichotomous achievement goal model. Few studies on achievement goal orientations have been conducted on the 2 x 2 achievement goal framework ([Van Yperen, Elliot, & Anseel, 2009](#_ENREF_21)). One problem with applying the 2 x 2 achievement goal model to the study is that some constructs of this framework still quite difficult for participants to understand and interpret when they are responding to the items of self-report questionnaires. In particular, mastery-avoidance is still under debate and remains to be clear ([Ciani & Sheldon, 2010; Marzouq, Carr & Slade, 2011 as cited in Carr & Marzouq, 2012](#_ENREF_6)).

Furthermore, even though a number of studies have already been conducted that support the validity this framework, they mostly were conducted in western countries (e.g., [Baranik, Barron, & Finney, 2007](#_ENREF_2); [Conroy, Elliot, & Hofer, 2003](#_ENREF_7); [Elliot & McGregor, 2001](#_ENREF_12); [Wang, Biddle, & Elliot, 2007](#_ENREF_22)). Therefore, emerging research studies conducted in other parts of the world on the construct validity of 2 x 2 achievement goal model can obtain a full understanding of the cross-cultural influences on the achievement goal orientation theory.

The purposes of this study were to establish the construct validity of the Thai version of achievement goal orientation scale (suggested by the 2 x 2 framework) using a confirmatory factor analytic technique. I hypothesized that the four-factor representation would be replicated in this analysis.

**Methods**

**Participants**

The convenience sampling was employed in this study with 518 volunteer undergraduate students in higher education in Thailand. More than 98% of the responses to the survey were complete. Female students comprised the majority of the final sample for analysis (392 participants or 75.7%). In our sample, the composition of academic program was 42.5% social science, 17.4% humanities, 5.2% health science, 17.6% economics, and 17.4% nursing.

**Instruments**

The first section of the survey asked for the general information (e.g. gender, faculty, major, GPA). The second section of the survey measured students’ achievement goal orientation in the general undergraduate classroom context (consisted of 15 items). The achievement goal orientation items were composed to reflect mastery-approach (e.g., ‘I feel satisfied when I learn new things in my class.’), performance-approach (e.g., ‘The most important thing is that other people should think of me as excellent.’), and performance-avoidance (e.g., ‘I avoid asking questions because I don’t want to look stupid.’) goal orientations from previous achievement goal orientation surveys, and mastery-avoidance goal orientation (e.g., ‘I worry that I may not learn all that I possibly could in this class’) based on Elliot and McGregor ([2001](#_ENREF_12))’s study. I used a 5-point (Linkert-type) response scale from strongly disagree (1) to strongly agree (5), with larger values indicating a stronger goal orientation.

**Data analysis**

To determine the internal consistency reliability of the instrument for a sample of examinees, the coefficient Cronbach’s alpha which is a statistical technique was performed. Alpha coefficient value is above the acceptable threshold of .6 ([George & Mallery, 2003](#_ENREF_13); [Kline, 2000](#_ENREF_15)).

Achievement goal orientation scale was tested using confirmatory factor analysis (CFA). All of the CFA were implemented by software program AMOS. Maximum likelihood estimation methods were derived from covariance matrices. Model fit was evaluated using the following indices: (1) the chi-square (); (2) comparative fit index (CFI); (3) goodness of fit index (GFI); (4) normed fit index (NFI); and (5) rooting mean squared error of approximation (RMSEA). , the original fit index for structural models, is a test of difference between observed and expected covariance matrices. Non-significant values indicate that the hypothesized model fits the data. However, the one problem with chi-square test of model fitting is that it is sensitive to the normality of the data and to the sample size; it very readily reaches significance with large sample size ([Barrett, 2007](#_ENREF_3); [Bollen, 2005](#_ENREF_5); [Tinsley & Brown, 2000](#_ENREF_20)). Due to these drawbacks of chi-square test, therefore, many alternative fit statistics have been considered. The cutoff criteria for fit indexes were recommended by Baumgartner and Homburg ([1996](#_ENREF_4)); Hu and Bentler ([1999](#_ENREF_14)). RMSEA, CFI, GFI, and NFI are indices which should fall between 0 and 1. The values with greater than .90 (for CFI and GFI), and .95 (for NFI) will be considered a good fitting between the model and data. Good fitting also have RMSEA values that are at or less than .06. Moreover, ratio of change in chi-square to degrees of freedom (/df) should be at or less than to 2 or 3.

**Results**

Results of descriptive statistics (means and standard deviations) of the measure for 2 x 2 achievement goal orientation model were shown in Table 1. Results of the reliability (Cronbach’s Alpha value) of the measure for ‘mastery-approach’, ‘mastery-avoidance’, ‘performance-approach’, and ‘performance-avoidance’ as sub-scales for a model were .66, .85, .84, and .76, respectively.

Insert table 1 here

After using the CFA technique with the observed data, most fit index values indicated an adequate fit for the proposed model. The  was significant in a model ( = 281.258, df = 84, *p* < 0.01; /df = 3.35). Although this model had a statistically significant  value, it is not surprising because the  is sensitive to the normality of the data and to the sample size; it very readily reaches significance with large sample size ([Barrett, 2007](#_ENREF_3)). Other fit indexes show acceptance the model (CFI = .927; GFI = .932; NFI = .900; RMSEA = .067). The factor loading of the items and intercorrelations among the four achievement goals are presented in Fig 1.

Insert figure 1 here

**Discussion and Conclusion**

Although the 2 x 2 achievement goal framework has been introduced in the literature for over decade, most studies still used a trichotomous achievement goal model. One of the reasons is that there are no wide range of the study on its construct validity and reliability of the scale. The purpose of this study was to contribute the body of knowledge on the assessment of achievement goal orientation based on the 2 x 2 framework by testing constructs’ reliability, and further evaluating the construct validity for cross-cultural validity in non-western context. Two notable findings of the current study support and/or extend prior researches. Firstly, as expected, the results from confirmatory factor analysis which indicated an adequate fit with the data supported the originally hypothesized the four-factor structure consisting of mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance. The results also are entirely consistent with prior researches measuring goal orientation used four-factor conceptualization, which they mostly were studied in western countries (e.g., [Baranik, et al., 2007](#_ENREF_2); [Radosevich, Allyn, & Yun, 2007](#_ENREF_18)). Thus, the emergence of the four-factor model as a representation of the achievement goal orientation indicated that undergraduate students understood the four types of achievement goals by providing accurate explanations for the behavior of a character pursuing these goals. In particular, the mastery-avoidance construct had been used in this study while most prior studies in the achievement goal literature have not included this construct in the measurement of the goal orientation. Secondly, in term of the internal consistency reliability of the instrument by estimating Cronbach's alpha values among test items of each factor, the smallest value found was .66, while the largest was .85. Based on these results, the instrument is reliable.

According to these findings, the achievement goal orientation model that centered on the 2 x 2 achievement goal framework can be applied to undergraduate students. Furthermore, it is important to note that model of the 2 x 2 goal framework should be considered in the future studies on achievement goal orientations.

However, the present study had also limitations. Firstly, in CFA, although most fit indices of the four-factor model of achievement goal orientation indicated an acceptable model fit with the data, these values had not reached the level of good fit ([Baumgartner & Homburg, 1996](#_ENREF_4); [Hu & Bentler, 1999](#_ENREF_14)), which the value should be above .95 for CFI, GFI, and NFI and less than .05 for RMSEA. Secondly, as the limitation of using self-report questionnaires, the results may not reflect the truth of participant’s manner. The results may be exaggerated because they may be too embarrassed to reveal private details.

In conclusion, the present research provides further evidence that supported the independence of the four achievement goal constructs (2 x 2 framework), and also showed empirical evidences to prove a valid and reliable achievement goal orientation scale of Thai version. I also again encouraged researchers to use this framework for future achievement goal orientation researches. Future research ought to examine the validity of this instrument in other types or contexts not examined (e.g., high-school students).

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**Table 1** Descriptive statistics for outcome measures

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | Males  (N=126) | | | | Females (N=392) | | | | Total  (N=518) | | | |
|  | | M | | SD | | M | | SD | | M | | SD | |
| mastery-approach | | 3.88 | | .58 | | 3.82 | | .55 | | 3.84 | | .55 | |
| mastery-avoidance | | 3.47 | | .90 | | 3.57 | | .80 | | 3.55 | | .82 | |
| performance-approach | | 3.42 | | .82 | | 3.31 | | .76 | | 3.34 | | .78 | |
| performance-avoidance | | 2.70 | | .97 | | 2.45 | | .85 | | 2.51 | | .88 | |



**Fig. 1**: Confirmatory factor analysis of the achievement goal model