The 2 x 2 achievement goal framework and intrinsic motivation among Filipino students: A validation study

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Abstract In Western studies, the applicability of the 2 x 2 achievement goal framework (Elliot & McGregor, 2001) was established from within diverse samples (e.g., Cury, Elliot, Fonseca, & Moller, 2006; Witkow & Fugilni, 2007). However, there is not much evidence for the theoretical and psychometric validity of the 2 x 2 framework among Asian populations, where some research suggest problems with some of the basic conceptual categories underlying the model. This study explored the applicability of the four-factor achievement goal model (mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance) among Filipino high school students, with particular emphasis on the item analysis, reliability and validity of the measure; and examined the predictive utility of the framework on intrinsic motivation. Results from item analysis provided a relatively strong support that the 2 x 2 achievement goal measure was internally consistent. Exploratory factor analysis showed only three distinct factors as against the hypothesized four-factor model. All items representing avoidance goals (mastery-avoidance and performance-avoidance) significantly loaded on a single factor. Confirmatory factor analysis was performed using both absolute and incremental fit indices. Results indicate that the data did not fit the model under investigation. Nevertheless, all of the achievement goals except performance-avoidance goals were significant predictors of student's intrinsic motivation.

Keywords: *Achievement goal, mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance, intrinsic motivation*

Introduction

One of the most significant variables in the motivational research in educational milieu is the type of achievement goals pursued by students. Achievement goals reflect the purpose of an individual's achievement pursuits (Dweck & Leggett, 1988), and have emerged as the most prominent account of individual's affect, cognition, and behavior in competence-relevant settings (Ames, 1984a; Elliot & Church, 1997). In understanding student's motivation, it focuses on

why individuals are motivated rather that whether individuals possess or lack motivation (Ames, 1992a).   Achievement goal theorists commonly defined achievement goals as the purpose of task engagement (Maehr, 1983), and the specific type of goal is conceived to create a framework for how individuals interpret, experience, and act in their achievement pursuits (Dweck, 1986). Achievement goals, which are either defined normatively (demonstrating competence relative to others) or self-referentially (developing competence or skills) are considered to be important determinants of people's motivational orientation toward competence (Harackiewicz & Elliot, 1993).   As such, achievement goals are viewed as important predictors of a host of achievement-relevant processes and outcomes.

Generally there are two goal types: mastery goals and performance goals. These goals have been differentiated by their linkages to contrasting patterns of motivational processes. Central to mastery goal is a belief that effort and outcome co-vary, and it is this belief pattern that maintains achievement-directed behavior over time (Weiner, 1986). The focus of attention is on the intrinsic value of learning (Meece & Holt, 1990). With students pursuing mastery goals, they are oriented toward developing new skills, trying to understand their work, improving their level of competence, or achieving a sense of mastery based on self-referenced standards (Ames, 1992b). Thus, the motivation of the individual is focused on mastering and understanding the content of the lesson and shows more willingness to engage in the learning process. On the other hand, the central focus of performance goals is on one's ability and sense of self-worth (Dweck, 1986). In this goal orientation, ability is evidenced by doing better than others, and surpassing normative-based standards, or by achieving with little effort (Ames, 1984b). In this performance orientation, learning is viewed only as a way to achieve a desired goal and student's attention is directed towards achieving normatively defined success. When students adopt performance goals, they perceive ability-outcome linkages and their behavior are guided by their perception of their own ability to perform (Covington & Beery, 1976). Thus, the motivation of the individual is focused on demonstrating their superior skills to other students in his class. According to this dichotomous conceptualization, the extent to which student endorse mastery goals is negatively associated to the extent to which they endorse performance goals, and this pattern have been illustrated in a number of empirical studies (i.e., Nicholls, Cobb, Wood, Yackel, & Patashnick , 1990; Rhodewalt, 1994).

Traditional research evidence suggests that it is mastery goal orientation that promotes a motivational pattern likely to promote long-term and high-quality involvement in learning (Ames, 1992a). However, this omnibus dichotomy (the mastery-performance distinction) was unable to explain why at times, mastery and performance goals resulted in similar levels of objective achievement despite different patterns of engagement (Elliot, 1999). Furthermore, empirical examination of the mastery-performance framework revealed that performance goals were not consistently associated with maladaptive outcomes (Elliot & Church, 1997).   Researcher therefore revised the original goal theory by dividing performance goals into approach and avoidance orientation, which was labeled as the trichotomous goal framework.   The performance goal dichotomy is distinguished by either a desire to achieve success, associated with performance-

approach, or to avoid failure, associated with performance-avoidance (Elliot & Church, 1997; Elliot & Harackiewicz, 1996). In a study testing a hierarchical model of approach and avoidance achievement motivation (Elliot & Church, 1997), it was found that mastery goals facilitated intrinsic motivation but the same goals did not have a reliable effect on graded performance. Performance-avoidance goals on the other hand proved negative to both intrinsic motivation and graded performance while performance-approach goals manifested a null relationship with graded performance. The offering of a trichotomous achievement goal framework provided empirical evidence that the two functionally separate goals lead to different outcomes, with performance-approach goals linked with some adaptive outcomes especially achievement (Elliot, 1999; Harackiewicz, Baron, & Elliot, 1998), and performance-avoidance goals linked with maladaptive outcomes (Elliot, 1997;Elliot & Church, 1997; Elliot & Harackiewicz, 1996). With this revised trichotomous framework, it is not performance goals in general, but performance-avoidance goals in particular that are consistently maladaptive (Harackiewicz, Barron, Pintrich, Elliot, & Trash, 2002). Both mastery and performance demonstration goals are viewed as approach-oriented because they involve regulation in relation to potential positive outcomes, while performance-avoidance are viewed as avoidance-oriented because they involve regulation in relation to potential negative outcomes (Elliot, 1997; Elliot & Church, 1997; Elliot & Harackiewicz, 1996).

Using undergraduate students in an introductory-level psychology class from a New York university as samples in the investigation, Elliot & McGregor (2001) presented a further revision of the trichotomous framework by splitting mastery goals to create mastery-approach and mastery-avoidance achievement goals. The rationale of the proposed framework is based on how competence, which is at the conceptual core of the achievement goal construct, is defined or valenced. Competence could either be defined as absolute/intrapersonal (the requirement of the task itself or developing own understanding and mastery) or normative (the performance of others). On the other hand, competence could either be positively valenced (approaching success) or negatively valenced (avoiding failure). This is the 2 x 2 achievement goal framework. It consists of four distinct goals and these goals are the individuals' representation of competence-based outcomes which they strive to attain or avoid. These goals include mastery approach (focused on attaining intrapersonal competence), performance-approach (focused on attaining normative competence), mastery-avoidance (focused on avoiding intrapersonal competence) and performance avoidance (focused on avoiding normative incompetence). Figure 1 shows the representation of the 2 x 2 achievement goal framework.

Figure 1
The 2 x 2 Achievement Goal Framework
Definition and Valence Represent the two Dimensions of Competence (Elliot & McGregor, 2001).

		Definition	
		Absolute/intrapersonal (mastery)	Normative (performance)
Valence	Positive (Approach)	Mastery-Approach Goal	Performance-Approach Goal
	Negative (Avoid)	Mastery-Avoidance Goal	Performance-Avoidance Goal

In Western studies, the fit or the utility of the 2 x 2 framework was established from within a diverse sample (e.g., Cury, et al., 2006; Elliot & McGregor, 2001; Finney, Pieper, & Baron, 2004; McGregor & Elliot, 2002; Witkow & Fulgini, 2007). Meanwhile, studies among Filipino samples (i.e Bernardo, 2003) linked achievement goals and learning among Filipino samples, but focused on adopting the mastery-performance distinction. Thus, the purpose of this study was to explore the fit or applicability of the 2 x 2 achievement goals framework among Filipino students. Furthermore, it is sought to determine whether the achievement goal framework is predictive of intrinsic motivation, defined as the inherit tendency to seek out challenges to explore and to learn (Deci & Ryan, 1985).

Method

Sample and Sampling

A total of 682 high school students (388 females and 294 males) from two national secondary schools (both N=341, 170 juniors and 171 seniors) served as participants. The samples' ages ranged from 13 to 22 years (mean age = 15.04 years, SD = .91)

Measures

Items for all measures were worded so that students would refer to their Mathematics class when answering the items.

Achievement goals. The items were lifted from the instrument used by Elliot and McGregor (2001). Sample items are "it is important for me to

understand the content of this course as thoroughly as I'd like" for mastery-approach; "I worry that I may not learn all that I possibly could in this class" for the mastery-avoidance; "It is important for me to do better than other students in this class" for performance-approach; and "I just want to avoid doing poorly in this class" for performance-avoidance. Respondents indicated the extent to which they thought each item was true of then on a 1(not all true of me) to 7 (very true of me) scale.

Intrinsic motivation. Seven items were used to assess participants' intrinsic motivation toward their Mathematics class (Elliot & Harackiewicz, 1996). Sample items include "I think this class is interesting". Participants indicated their responses using a 1 (strongly disagree) to 7 (strongly agree) scale. The scale reliability coefficient was .83.

Data Analysis

The analysis involved dividing the data sets into two halves, in which the first half was intended for exploratory factor analysis and the second half was utilized for the confirmatory factor analysis. Descriptive statistics like mean and *SD* were used to report student's responses on the achievement goal questionnaire and intrinsic motivation. Pearson (r) was used to establish the intercorrelations of the different variables. Item-scale correlation was used to describe the discrimination indices of the items in each subscale. Cronbach alpha was computed to estimate the reliability of each of the subscales of the measure. Factor Analysis was conducted on the twelve achievement goal items using principal components extraction with varimax rotation. Confirmatory factor analysis was performed using Statistica 8.0 to test the fit of the four-goal model. For this procedure, three fives fit indices were used. These included: (1) chi-square fit index (2) chi-square over degrees of freedom index, (3) root-mean-square error of approximation (RMSEA), (4) Comparative Fit Index (CFI), and (5) the Non-Norm Fit Index (NNFI) or the Tucker-Lewis Index (TLI). Finally, regression analyses were performed to examine the predictive utility of the achievement goals to student's intrinsic motivation.

Results

Descriptive Statistics, Item Analysis and Reliabilities

The mastery-approach scale had the highest mean (5.94) while mastery-avoidance had the lowest (4.92). The correlations among the measures indicate, that mastery-approach goals were positively correlated with performance-approach goal ($r = .41$, $p < .01$); but it is also correlated with performance-avoidance ($r = 38$, $p < .01$). Similarly, performance-approach goals were positively correlated with performance-avoidance ($r = .33$, $p < .01$) but were also correlated with mastery-avoidance ($r = .41$, $p < .01$). Correlations also show that all scales except the master-avoidance scale were significantly correlated with intrinsic motivation. It suggests that students who are most likely to adopt mastery-approach ($r = .36$) and

performance-approach   (r = .27) goals have higher levels of intrinsic motivation in their Math classes.

Analyses showed that of the four scales of the achievement goal questionnaire, the highest average inter-item correlation (.40) was found among the items for the performance-approach and mastery-avoidance (Table 2). It can be observed that there are no much difference in the reliability coefficients of the scales and the item-scale correlations. Nevertheless, coefficients were only moderate.

Table 1
Descriptive Statistics and Intercorrelations Among Variables

		M	SD	1	2	3	4	5
(1)	Mastery-approach goals	5.94	.85	----				
(2)	Mastery-avoidance goals	4.96	1.15	.18*	----			
(3)	Performance-approach goals	5.23	1.13	.41*	.17*	----		
(4)	Performance-avoidance goals	5.67	1.09	.38*	.43*	.33*	----	
(5)	Intrinsic motivation	5.69	.90	.36*	.01	.27*	.18*	-----

* p <.01

Table 2
Item-scale Correlation and Reliability Coefficients

Achievement Goal	Item-total Correlation	Alpha if item is deleted
Mastery-approach		
Item 1	.50	.42
Item 5	.39	.58
Item 9	.41	.56
Scale Mean=17.83	M=.36	Cronbach's alpha=.63
Mastery-avoidant		
Item 2	.47	.57
Item 6	.46	.58
Item 10	.49	.55
Scale Mean=14.87	M=.40	Cronbach's alpha=.66
Performance-approach		
Item 3	.50	.49
Item 7	.42	.60
Item 11	.46	.55
Scale Mean=15.70	M=.40	Cronbach's alpha=.65
Performance avoidance		
Item 4	.42	.61
Item 8	.52	.48
Item12	.45	.57
Scale Mean=17.02	M=.39	Cronbach's alpha=.65

Exploratory Factor Analysis

An EFA was conducted on the 12 achievement goal items using principal component extraction with varimax rotation. Only three factors had eigenvalues exceeding unity (Kaiser criterion eigenvalue >1, which accounted) for a total of 51.88% of the variance explained (Table 3).

Table 3
Eigenvalues of the Extracted Factors

Factor	Eigenvalue	% Total	Eigenvalue Cumulative	Percentage Cumulative
1	3.48	28.99	3.84	28.99
2	1.69	14.05	5.16	43.04
3	1.06	8.84	6.23	51.88

All the avoidance items (mastery and performance) loaded significantly on a common factor. The summary of factor loadings of the actual items is presented in Table 4. For the performance-approach scale, all the three items significantly loaded on a single factor (loadings ranged from .71 to .77), and likewise for the mastery-approach scales; all of the three items loaded on a single factor (loadings ranged from .67 to .77)

Table 4
Factor Loadings for Achievement Goals

Achievement goal items	F1	F2	F3
I just want to avoid doing poorly in this class		.51	
My goal in this class is to avoid performing poorly		.49	
My fear to performing poorly in this class is what motivates me to study		.55	
I worry that I may not learn all that I possibly could in this class		.71	
Sometimes, I am worried that I do not understand the content of lesson as thoroughly as possible.		.72	
I am often concerned that I may not learn all about there is to learn in this class		.71	
It is important for me to do better than other students in this class	.72		
It is important for me to do well compared to others in this class	.74		
My goal in this class is to get a better grade than most of the other student	.77		
I want to learn as much as possible from this class			.77
It is important for me to understand the content of this course as thoroughly as possible			.67
I desire to completely master the lessons presented in this class.			.70

Note. N=341. All factor loadings > .40. Factor loadings were obtained using principal components extraction with varimax rotation. F1=Performance-approach, F2=Avoidance-approach, F3=Mastery approach

Confirmatory Factor Analysis

Results of the confirmatory factor analysis show that the data did not satisfy most of the conventional criteria for a good fitting model. The CFA confirms the finding in the earlier factor analysis that the items for the mastery-avoidance and performance scales loaded on a single latent variable. With a sample size of N=341 the fit of the model was adequate, χ^2/df=3.54, RMSEA=.07, CFI=.83, and TLI=.78.

Achievement Goals as Predictors of Intrinsic Motivation

The regression summary in Table 5 shows that both mastery-approach [F (4.677) = 36.41, p < .01 (β = .33)] and performance-approach goals (β = .15) were positive predictors of intrinsic motivation, while mastery-avoidance goals (β = -.12) were negative predictors of intrinsic motivation. These apply that students who pursue approach goals orientation tend to be intrinsically motivated in their Math class while students who are trying to avoid intrapersonal incompetence (mastery-avoidance goals) tend to have lower levels of intrinsic motivation.

Table 5
Achievement Goals as Predictors of Intrinsic Motivation

	Beta	SE	B	SE	t	p
Mastery-approach	.33**	.038	.37	.04	8.68	.001
Mastery-avoidance	-.12**	.038	-.10	.032	-3.05	.002
Performance-approach	.15**	.040	.12	.031	3.81	.001
Performance-avoidance	.06	.041	.054	.034	1.56	.120

**p<.01

Discussion

The research was conducted to investigate the applicability of the 2 x 2 achievement goal framework on Filipino students. Results from the item analysis provided a relatively strong support that the items of the achievement goal measure have good discrimination indices and was internally consistent; although showing lower coefficients compared to the findings of Eliot and McGregor (2001) and Cury et al., (2006), where reliability coefficients ranged from .83 to .92, and from .89 to .91, respectively. Nonetheless, reliability coefficients and average inter-scale correlations fell within a moderate range.

The analysis shows that all the scales are correlated with each other, even if the scales do not share the same definition or valence, as the model posits. It suggests that students do not only adopt multiple goals, but also goals that are contrary to one another. Thus, it seems students cannot differentiate approach from avoidance goals. The results of the factor analysis revealed that all the avoidance items (mastery and performance) loaded on a single latent construct, but confirmatory factor analysis did not support this model. In the achievement goal literature, it was mastery-avoidance that has likely have been overlooked until the

inception of the 2 x 2 framework came. Most assume that mastery goals represent an approach form of regulation. In this study, mastery avoidance, in which incompetence is the focal point of regulatory attention, was validated not as an independent achievement goal.

Intercorrelations of the achievement goals revealed two unexpected results. Mastery-approach was found to be correlated with performance-avoidance and mastery-avoidance correlated with performance approach. This implies that a significant portion of the sample respondent are concern with performing and doing better than others and are also focused on worrying about learning very little of the materials presented in the class, or even at the same time trying to avoid doing poorly in the class. There are also students who are focused on attaining mastery of the lesson and are also concerned with avoiding not performing poorly in the class (Pintrich, 2000). These situations might have contributed to the observed intercorrelations of the variables that theoretically should not correlate with one another.

The confirmatory factor analysis revealed non-fit of the data to the 2 x 2 achievement goal framework. Theoretically, achievement goals that share the same definition or valence would load on a single latent variable. In this case, however, items on a positive valance (mastery-approach) and normative definition (performance-avoidance) load on a single factor. Reliability coefficients revealed an internal consistency of the measure but factor analytic procedures did not provide valid indices of the fitness of the measures on the 2 x 2 framework. Nevertheless, mastery-approach goals have been documented to be highly related with intrinsic motivation, and are found to be a positive predictor of the intrinsic motivation.

The finding indicated that the 2 x 2 framework did not operate distinctly among the samples used in this study. It is however premature to conclude that the framework is not cross-culturally valid. The study only involved samples from two secondary schools instead of examining and combining and/or comparing different samples. The limitations of language used might also have caused the non-satisfaction of the hypothesis. Though English is the medium of instruction used in the class, Filipino is mostly used as medium of communication. The translation was not considered because the psychometric properties of the measure would be different, and establishing equivalence is beyond the scope of this research. It is therefore very imperative to conduct further investigation to validate the finding of this research. In so far as the measure is concerned, the items showed considerably favorable psychometric properties like reliability coefficients. It is recommended, however, to find out if translations in the existing goal questionnaire would account for the generality of the framework. Despite the weak assumption, that the achievement goal framework works well with Filipino, the researcher believes that the measure can still be used for the purpose of differentiating the achievement goals of individual student so that we can help them realize their goals and at the same time, perform at high levels.

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