

Validation of the Trichotomous Framework of Achievement Goals for Omani Students

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While the trichotomous framework of achievement goal theory has received considerable discussion in Asian and North American cultures, it is not clear whether this framework can also be applied in Arabic cultures. The purpose of this study was to test the validity of the trichotomous framework of achievement goals as measured by Midgley et al.'s (2000) scales on Omani students. Ninth grade students (N = 1,636) enrolled in science classes at Muscat public schools in Oman completed the scales. The sample was randomly divided into two subsamples. The first sample (n = 786) was used for exploratory factor analysis whereas the second sample (n = 850) was used for confirmatory factor analysis. Results of both analyses supported the three-factor structure of the trichotomous framework of achievement goal theory: (a) mastery, (b) performance-approach, and (c) performance-avoidance goals; all correlated positively with each other (r_s ranged from .32 to .45). Construct validity of the scales was supported by their relationships with academic self-efficacy in ways that

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are predicted by theory and consistent with previous research. Reliability analyses showed that the scales' scores had relatively moderate levels of internal consistency. Implications of the findings for future research and practice are discussed.

Key words: achievement goal, academic motivation, validation

Achievement goals refer to “the desire to develop, attain or demonstrate competence in an activity” (Okun, Fairholme, Karoly, Ruehlman, & Newton, 2006, p. 255). In educational motivation research, achievement goal theory has developed within a social-cognitive framework (Dweck & Leggett, 1988; Maehr, 1989; Nicholls, 1989; Weiner, 1990). Achievement goal theorists have traditionally recognized two types of achievement goals (also called a dichotomous framework of achievement goals): the goal to develop ability and the goal to demonstrate ability or avoid demonstrating the lack of ability (Elliot, 1999, 2005). These two goals have alternatively been labeled learning and performance goals (Dweck, 1986), task-involvement and ego-involvement goals (Nicholls, 1984), and mastery and performance goals (Ames & Archer, 1987, 1988); respectively. Dweck and Leggett (1988) proposed that “the goals individuals are pursuing create the framework within which they interpret and react to events” (p. 256). Mastery goals create a framework in which inputs and outputs provide information about one’s learning and mastery, whereas performance goals create a framework in which inputs and outputs are interpreted in terms of one’s ability and its adequacy (Dweck & Leggett, 1988).

Achievement goals are thought to vary across individuals (Maehr, 1983, 1984), and positive and negative patterns of cognition, affect, and behavior may be evoked by the adoption of a particular achievement goal (Ames, 1992a). From the perspective of achievement goal theory, students who adopt mastery goals are expected to persist in the face of difficult events, seek challenging activities, and have high intrinsic motivation (Ames, 1992b; Dweck, 1986; Nicholls, 1984). In comparison, students who adopt performance goals are expected to minimally persist

in the face of difficult events, avoid challenging activities, and have low intrinsic motivation (Ames, 1992b; Dweck, 1986; Nicholls, 1984). Mastery goals have consistently been linked to a positive set of outcomes such as deep processing of studying materials, long term retention of information, adaptive attributional patterns of success and failure, positive perceptions of self-efficacy, and appropriate help-seeking behaviors (Ames, 1992b; Elliot, 1999; Gerhardt & Brown, 2006; Weiner, 1990, 1994, 2000). However, the effects of pursuing performance goals are less clear. Some studies have found that adoption of performance goals has negative effects when accompanied by low perceived competence (e.g., Elliot & Church, 1997; Elliot & Dweck, 1988), whereas other studies have not supported these effects (e.g., Elliot & Harackiewicz, 1996; Harackiewicz & Elliot, 1993). As a result, achievement goal theory has undergone a number of theoretical advances.

For example, Elliot and his colleagues have proposed a trichotomous framework of achievement goals that further differentiates performance goals into approach and avoidance goals (Elliot & Church, 1997; Elliot & Harackiewicz, 1996). In this framework, three types of achievement goals are posited: mastery goals that focus on the development of competence, performance-approach goals that focus on having favorable judgments of competence, and performance-avoidance goals that focus on avoiding unfavorable judgments of competence (Elliot & Church, 1997; Elliot & Harackiewicz, 1996). The validity and utility of this trichotomous framework of achievement goals have been demonstrated for middle school and college level students in North America.

In addition, the applicability of the trichotomous framework of achievement goals across cultures has been the focus of attention for many Asian researchers and psychologists (e.g., Bernardo & Ismail, 2010; Chan & Lai, 2007; Lau & Lee, 2008; Tanaka, Takehara, & Yamauchi, 2006). Interest in this issue stems primarily from the general distinction that Western cultures tend to be individualist whereas Eastern cultures tend to be collectivist (Fiske, 2002). The extent to which the trichotomous framework of achievement goals is applicable to the Western and Eastern cultures is worth of investigation. Although

some studies have generally supported the trichotomous framework of achievement goal theory with Asian students (Lau & Lee, 2008; Ng, 2000), others have revealed different cultural-based meanings of achievement goals for Asian students (Bernardo & Ismail, 2010; Tao & Hong, 2000). For example, Tao and Hong (2000) found that in the Chinese culture, mastery goals are positively related to performance goals, whereas in the American culture, mastery goals and performance goals tend to be correlated negatively with each other. As contended by Tao and Hong (2000), academic achievement in the Chinese culture tends to be a social-oriented endeavor whereas in the American culture it is an individual endeavor.

While the trichotomous goal framework has received considerable discussion in the North American and Asian cultures, it is not clear whether this framework can also be applied in the Arabic cultures. Urdan (2004) argued that there might be cultural differences in the pursuit and consequences of achievement goals that may not have been sufficiently researched, and as such there have been calls for more cultural research in this area (Chan & Lai, 2007). In response to these calls, the present study sought to test the validity of the trichotomous achievement goal theory in the context of Arab students in Oman, which tends to be a collectivist society (Aldhafri, Kazem, Alzubiadi, Yousif, Al-Bahrani, & Alkharusi, 2009). To the best of my knowledge, this is the first study to expand the utility of the trichotomous framework of the achievement goal theory in Oman. Understanding students' achievement goals in Oman should help educators develop appropriate teaching and learning practices.

Although results of factor analytic procedures from studies conducted on college level students indicated that the performance-approach and performance-avoidance goals are independent orientations (Elliot & Church, 1997), studies conducted on middle school students tended to reveal some overlap between these two types of goals (Middleton & Midgley, 1997). Using factor analytic procedures, the present study would seek to clarify this relationship for ninth grade students in Muscat science classrooms in Oman. The study would adopt the trichotomous framework of achievement goal theory because it was assumed to be the most prevalent goal framework in achievement

settings (Elliot, 1999; Elliot & Church, 1997; Elliot & Thrash, 2001). Based on this framework of achievement goal theory, it was expected that factor analytic procedures in this study would yield the three dimensions of achievement goals: mastery, performance-approach, and performance-avoidance goals.

In addition to the type of participants, the difference between the aforementioned Elliot and Church's (1997) study and Middleton and Midgley's (1997) study could be attributed to their approach to the measurement of achievement goals. Elliot and Church's approach was based on the conceptualization of achievement goals as "cognitive-dynamic manifestations of two underlying competence-relevant motives, the need for achievement and the need to avoid failure" (p. 219). As a result, some of their items assessed affective components such as worries, fears, and concerns rather than reasons or purposes for engaging in academic behaviors, a definition on which Middleton and Midgley's scale was based. The present study focused on middle school students and as such its approach to the conceptualization of achievement goals would be based on the approach suggested by Middleton and Midgley's (1997) study.

Purpose of the Study

The purpose of this study was to test the validity of the trichotomous framework of achievement goals as measured by Midgley et al.'s (2000) scales on Omani students. The study would first examine the factor structure of the scales using exploratory factor analysis and then present further validation of the scales using confirmatory factor analysis. From a theoretical point of view, it was also of interest to test whether the trichotomous framework of achievement goals represents a better fit to the data than the classical mastery-performance framework and the approach-avoidance framework of achievement goals. The study would also provide preliminary information regarding the construct validity of the scales in terms of the correlations between the scales' scores and academic self-efficacy. Finally, the internal consistency reliability of the scales' scores would be established through Cronbach's alpha.

Methods

Participants

The participants were 1,636 ninth grade students enrolled in science classes at the Muscat public schools in Oman. There were 45% males and 55 % females. Their self-reported age ranged from 14 to 16 years with an average of 15 years and a standard deviation of 2 years. The majority (96.1%) of the participants was Omani and the rest were from Arabic speaking countries. For the purpose of this study, the sample was randomly divided into two subsamples. The first sample was used to examine the factor structure of the scales through exploratory factor analysis. The second sample was used to provide further validation of the scales by means of confirmatory factor analysis. The first sample ($n = 786$) consisted of 336 males and 450 females. The second sample ($n = 850$) consisted of 400 males and 450 females.

Procedures

After obtaining the Omani Ministry of Education's permission, the data collection process took place during a regular scheduled class meeting. The students were informed that they were not obligated to participate in the study, and if they wished to participate, their responses would remain anonymous and confidential. The students were also told that participation in the study would not influence their grades or relation with the teacher in any way.

Instrumentation

Achievement goals. The measure of achievement goal orientations contained 14 items from Patterns of Adaptive Learning Scales (Midgley et al., 2000). In their original version, the items measured students' adoption of mastery (5 items), performance-approach (5 items), and performance-avoidance (4 items) goals on a 5-point Likert scale ranging from 1 (*not all true*) to 5 (*very true*). Midgley et al. (2000) reported internal consistency reliabilities of .85, .89, and .74 for mastery,

performance-approach, and performance-avoidance goals as indicated by Cronbach's alpha, respectively. Assor and Connell (1992) suggested that Likert-type scales of four points provide more valid information on self-report measures designed for elementary, middle, and high school students. Therefore, in this study, the items were phrased in relation to the science class work using a 4-point Likert scale ranging from 1 (*completely not true*) to 4 (*completely true*).

Given that the language of the participants is Arabic, the author translated the items into Arabic. To verify the accuracy of the translation, the Arabic and English versions of the items were given to two professors in the area of educational measurement and psychology who were fluent in both Arabic and English. A discussion was held with the professors to verify discrepancies between the original and the translated versions. Few editing modifications were made as a result of the translation.

To establish content validity, the Arabic versions of the items were then given to five professors in the area of educational measurement and psychology from Sultan Qaboos University in Oman. They were asked to judge the clarity of wording and appropriateness of each item for the use with the targeted participants and its relevance to the construct being measured. Their feedback was used for refinement of the items. The majority of the consulted judges agreed that the items were clearly worded, appropriate for the participants, and relevant to the constructs being measured.

Self-efficacy. The Omani version of the 6-item academic self-efficacy scale (Aldhafri, et al., 2009) was used to measure students' perceptions of their competence to do their school academic work in science. Responses were obtained on a 4-point Likert scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Internal consistency reliability coefficient was .83 as measured by Cronbach's alpha.

Data Analysis

In relation to the aforementioned purpose of the study, the following statistical procedures were employed:

1. The achievement goal items have been validated for use with middle school students in the United States (Midgley et al., 1998; Midgley et al., 2000), but not for use with students in Oman to the best of my knowledge. As such, due to changes in the scales' anchors, wording and language of the items, and context where they were used, responses of the first sample to the 14 items of achievement goal orientations were submitted to principal components/exploratory factor analyses (PCA/EFA) to identify their underlying dimensions. Prior to the analyses, the data were screened for accuracy of data entry, missing values, normality, linearity, outliers, multicollinearity and singularity, and factorability. No particular number of components was hypothesized and the criterion was set to eigenvalues greater than one (Tabachnick & Fidell, 2001).

2. To provide further validity evidence of the achievement goal scales, a confirmatory factor analysis was used on the responses of the second sample with maximum likelihood estimation in LISREL 8.52 (Jöreskog & Sörbom, 1996). The analysis was conducted using the covariance matrix. Each item was constrained to load only on its hypothesized factor. One item on each factor was constrained to equal one in order to set a metric for the factors. Factor covariances were left free to be estimated, but the measurement errors were not allowed to covary. For an acceptable model fit, the ratio χ^2/df should be less than 3, the Root Mean Square Error of Approximation (RMSEA) should be less than .08, the Nonnormed Fit Index (NNFI) that is also called the Tucker-Lewis Index (TLI) should be greater than .95, and the Comparative Fit Index (CFI) should be greater than .95 (Kelloway, 1998). The RMSEA, NNFI, and CFI were chosen because they were found as being less affected by the size of the sample when compared to the Normative Fit Index (NFI), the Goodness-of-Fit Index (GFI), and the Adjusted Goodness-of-Fit Index (AGFI) (Schermelleh-Engel, Moosbrugger, & Müller, 2003).

Two additional CFAs were conducted to compare the fit of the trichotomous framework of achievement goals with two alternative models: (a) the classical dichotomous model in which the mastery goal items load on their respective factor whereas the performance-approach and avoidance items were collapsed to load on one factor, and (b) the

approach-avoidance model in which the mastery and the performance-approach items load together on one factor whereas the performance-avoidance items load on their respective factor. The fit indices for the three models were compared along with the $\Delta\chi^2$ tests. Also, as recommended by Schermelleh-Engel et al. (2003), the model with the smallest Akaike Information Criterion (AIC) would be regarded as the best fitted and the most parsimonious model.

3. As an evidence of the construct validity, zero-order correlation coefficients were computed between the scores of the whole sample on the achievement goal scales and their scores on the academic self-efficacy scale.

4. Internal consistency reliability for the scores of the whole sample on the achievement goal scales were established through Cronbach's alpha.

Results

Data Screening

The data screening process on the responses of the first sample showed no missing values and no concern about normality, linearity, multicollinearity, and singularity. Also, inspection of the correlation matrix of the 14 items revealed that the correlations when taken overall were statistically significant as indicated by the Bartlett's test of sphericity, $\chi^2(91) = 849.109$, $p < .001$. The Kaiser's measure of sampling adequacy (MSA) fell within acceptable range (values of .60 and above) with a value of .721. Each of the variables also exceeded the threshold value (.60) of MSA. Finally, most of the partial correlations were small as indicated by the anti-image correlation matrix. These measures all led to the conclusion that the set of 14 items of achievement goal orientations was appropriate for PCA.

Principal Components Analyses

Principal components analyses (PCA) were conducted on the responses of the first sample to the 14 items of achievement goal orientations to

determine their underlying dimensions. The initial unrotated PCA resulted in a factor model of three dimensions as indicated by the scree plot and eigenvalues exceeding unity. However, based on its pattern of factor loadings, this unrotated factor model was theoretically less meaningful and as such was difficult to interpret. Therefore, the analysis proceeded to rotate the factor matrix both orthogonally and obliquely to achieve a simple and theoretically more meaningful solution. One orthogonal rotation and one oblique rotation were run. Varimax rotation was used for the orthogonal solution, and oblimin rotation was used for the oblique solution. Both rotations resulted in a factor model of three dimensions as suggested by the scree plot and eigenvalues exceeding unity. There were no remarkable differences between the orthogonal solution and the oblique solution in terms of factor structure and pattern of factor loadings. However, as suggested by Tabachnick and Fidell (2001), the oblique solution was retained because the correlation between the first factor and the third factor was .35 as indicated by the factor correlation matrix.

Table 1 displays the factor loadings for the oblique three-factor model of achievement goal orientations. All items loaded .40 and above on their primary factor. Together the three factors accounted for 37.26% of the total variance. The first factor accounted for 17% of the variance (eigenvalue = 2.380) and consisted of five mastery goal orientation items. The second factor accounted for 11.349% of the variance (eigenvalue = 1.589) and consisted of five performance-approach goal orientation items. The third factor accounted for 8.911% of the variance (eigenvalue = 1.247) and consisted of four performance-avoidance goal orientation items.

Table 1: Summary of Factor Loadings by Principal Components Analysis for the Oblique Three-Factor Model of Achievement Goal Orientations

Item	Factor loadings		
	1	2	3
1. It is important to me that I thoroughly understand my science class work.	.64		
2. It is important to me that I improve my science skills this semester.	.64		
3. One of my goals is to master a lot of new science skills this semester.	.64		
4. It is important to me that I learn a lot of new science concepts this semester.	.63		
5. One of my goals in science class is to learn as much as I can.	.56		
6. It is important to me that I look smart compared to others in my class.		.62	
7. One of my goals is to show others that I'm good at science class work.		.57	
8. It is important to me that other students in my class think I am good at my science class work.		.57	
9. One of my goals is to show others that science class work is easy for me.		.43	
10. One of my goals is to look smart in comparison to the other students in my class.		.40	
11. One of my goals in science class is to avoid looking like I have trouble doing the work.			.60
12. One of my goals is to keep others from thinking I'm not smart in science class.			.52
13. It is important to me that my teacher doesn't think that I know less than others in science.			.47
14. It is important to me that I don't look stupid in science class.			.44

Note. Factor 1 = mastery goal orientation

Factor 2 = performance-approach goal orientation

Factor 3 = performance-avoidance goal orientation

Confirmatory Factor Analyses

To cross-validate the trichotomous model found in the PCA/EFA, a confirmatory factor analysis was conducted on the responses of the second sample to the 14 items of achievement goals. All items were specified to load on only their respective factor. All factor loadings were estimated in the measurement model. Factor covariances were left free to be estimated, but the measurement errors were not allowed to covary. Results yielded an inferential test of $\chi^2 = 172.45$ ($p = .00$, $df = 74$) with the following descriptive fit indices ($RMSEA = .04$ with $90\% CI = [.03-.05]$, $NNFI = .95$, and $CFI = .95$). These results suggest that the trichotomous model of achievement goals represents a good fit to the data. Table 2 presents standardized factor loadings for this three-factor model of the achievement goals. The factor loadings ranged from .55 to .74 for the first factor, from .49 to .63 for the second factor, and from .38 to .53 for the third factor. All factor loadings were statistically significant, $p < .05$.

Two additional CFAs were conducted to compare the fit of the trichotomous model of achievement goals with two alternative models: (a) the classical mastery-performance model in which the mastery goal items load on their respective factor whereas the performance-approach and avoidance items were collapsed to load on one factor, and (b) the approach-avoidance model in which the mastery and the performance-approach items load together on one factor whereas the performance-avoidance items load on their respective factor. Table 3 presents the fit indices for the alternative models compared to the trichotomous model. As displayed in Table 3, none of the alternative models evidenced a satisfactory overall fit. In addition, the trichotomous model had the lowest AIC value, suggesting that it is not only the best fitted model to the data, but also the most parsimonious model. Consistent with Western and Asian studies (e.g., Elliot & Church, 1997; Lau & Lee, 2008), the performance goals of the Omani students might best be differentiated into performance-approach and performance-avoidance goals.

Table 2: Standardized Factor Loadings for the Three-Factor Model of the Achievement Goals

Item	Factor loadings		
	1	2	3
1. It is important to me that I thoroughly understand my science class work.	.74		
2. It is important to me that I improve my science skills this semester.	.69		
3. One of my goals is to master a lot of new science skills this semester.	.60		
4. It is important to me that I learn a lot of new science concepts this semester.	.58		
5. One of my goals in science class is to learn as much as I can.	.55		
6. It is important to me that I look smart compared to others in my class.		.63	
7. One of my goals is to show others that I'm good at science class work.		.52	
8. It is important to me that other students in my class think I am good at my science class work.		.51	
9. One of my goals is to show others that science class work is easy for me.		.50	
10. One of my goals is to look smart in comparison to the other students in my class.		.49	
11. One of my goals in science class is to avoid looking like I have trouble doing the work.			.53
12. One of my goals is to keep others from thinking I'm not smart in science class.			.49
13. It is important to me that my teacher doesn't think that I know less than others in science.			.39
14. It is important to me that I don't look stupid in science class.			.38

Note. Factor 1 = mastery goal orientation
 Factor 2 = performance-approach goal orientation
 Factor 3 = performance-avoidance goal orientation

Table 3: The Fit Indices for the Alternative Models of Achievement Goals Compared to the Trichotomous Model

Model	χ^2	df	p-value	RMSEA	NNFI	CFI	AIC
Model 1	172.45	74	.000	.04(90% CI=.03-.05)	.95	.95	234.45
Model 2	193.57	76	.000	.05(90% CI=.04-.06)	.87	.88	251.57
Model 3	422.68	76	.000	.07(90% CI=.07-.08)	.80	.83	480.69
Model comparisons	$\Delta\chi^2$		Δdf		p-value		
Model 1 vs. 2	21.12		2		< .001		
Model 1 vs. 3	250.23		2		< .001		

Note. Model 1 = the trichotomous framework

Model 2 = the mastery-performance framework

Model 3 = the approach-avoidance framework

Correlational and Reliability Analysis

Having found that the trichotomous model of achievement goals was the best model to represent the data, it was of interest to establish construct validity of its scales' scores. As suggested by Midgley et al. (1998), construct validity is based on the degree to which the goal orientation scales are related to the academic self-efficacy in ways that are predicted by theory and in ways that are consistent with the previous research.

Table 4 presents descriptive statistics and internal consistency coefficients as measured by Cronbach's alpha for, and zero-order correlations between the three scales of achievement goals and academic self-efficacy. As shown in Table 4, the means for the achievement goals tended to be higher than their respective scales' midpoints, with small variability among students' responses suggesting that together the three goals could be operative in the achievement setting at the same time. The three measures of achievement goals were significantly moderately and positively correlated with each other suggesting that the participating students in this study may pursue more than one goal at the same time in the achievement setting (Pintrich, 2000). Although the relationships of academic self-efficacy with mastery and performance-approach goals were generally consistent with the achievement goal theory (Elliot, 1999) and previous research (e.g., Greene, Miller, Crowson, Duke, & Akey, 2004; Shih, 2005), the positive relationship between the performance-avoidance goals and academic self-efficacy agrees with Asian research (e.g., Lau & Lee, 2008; Shih, 2005) and disagrees with Western research (e.g., Midgley et al., 1998) suggesting that these types of goals might be operating differently in the Western and Eastern cultures.

In his 1967's book of *Psychometric Theory*, Nunnally stated that in the early-stage research, "reliabilities of .60 or .50 will suffice" (p. 226). In this study, the Midgley et al.'s (2000) achievement goal orientation scales were modified in terms of scales' anchors and language and were used for the first time with Omani students to the best of my knowledge. Taking this relatively new research context into account, the Cronbach's alpha reliability coefficients of .75, .66, and .54 found in this study fell within the aforementioned acceptable range specified by Nunnally (1967). However, more details about reliability will be discussed in the next section.

Table 4: Descriptive Statistics and Reliabilities for, and Zero-Order Correlations between the Three Scales of Achievement Goals and Academic Self-Efficacy

Variable	No. of items	Expected score range	<i>M</i>	<i>SD</i>	Reliability	<i>SEM</i>	Zero-order correlations			
							1	2	3	4
1	5	1 - 4	3.66	.38	.66	.22	-			
2	5	1 - 4	3.21	.69	.75	.35	.32***	-		
3	4	1 - 4	3.12	.69	.54	.47	.33***	.45***	-	
4	6	1 - 4	3.15	.55	.83	.23	.46***	.29***	.23***	-

Note. Variable 1 = mastery goal orientation
 Variable 2 = performance-approach goal orientation
 Variable 3 = performance-avoidance goal orientation
 Variable 4 = academic self-efficacy

*** $p < .001$

Discussion

As expected, the findings from factor analytic techniques in this study showed the prevalence of three types of achievement goal orientations for the participating ninth grade students in Muscat science classrooms in Oman: mastery, performance-approach, and performance-avoidance goal orientations. The mastery goal orientation focused on the development of competence. The performance-approach goal orientation focused on the demonstration of competence to others. The performance-avoidance goal orientation focused on avoiding the demonstration of incompetence to others. The model fit index of the trichotomous framework of achievement goals was significantly

superior to that of all of the other dichotomous frameworks of achievement goals. Therefore, from a theoretical point of view, these findings add support to the trichotomous conceptualization of achievement goal theory (Elliot & Church, 1997; Midgley et al., 2000).

Although the present study findings agree with Asian research in terms of the pattern of inter-correlations among the goals (e.g., Chan & Lai, 2007; Lau & Lee, 2008), it differs from those conducted in the Western countries, mainly North America. In this study, the mastery, performance-approach, and performance-avoidance goals all correlated positively with each other (r_s ranged from .32 to .45); whereas in both studies conducted by Kaplan, Gheen, and Midgley (2002) and Middleton and Midgley (1997) using the same scales for middle school students in the United States, the mastery and performance-avoidance goals were not correlated with each other. Thus, as indicated by Senko and Harackiewicz (2005), the participating students in the current study who strongly adopt any one goal tended to adopt the other goals to a modest degree as well. From a practical point of view, the positive correlations found in this study among achievement goal orientations seem to point to the reality of achievement settings in that classrooms often provide students opportunities to pursue more than one goal (Wentzel, 1992). Therefore, the teachers of the participating students in this study seem to expect their classes to not only master the learning materials, but also to achieve higher grades than others.

Given that both mastery and performance-approach goals represent forms of approach achievement motivation (Elliot, 1999), it was not surprising that academic self-efficacy in this study was positively related to these types of goal orientations. These findings not only are consistent with previous Western and Asian studies (e.g., Greene et al., 2004; Shih, 2005), but also confirm Bandura's (1986) social-cognitive theory and Elliot's (1999) review of achievement goal theory regarding the relation between self-efficacy and approach achievement goals. Therefore, the present study provides evidence of the construct validity for the scores on the mastery and performance-approach goal orientation scales used in the study.

What was surprising in this study was the positive relationship between academic self-efficacy and performance-avoidance goals.

Many Western studies reported negative relationships between academic self-efficacy and performance-avoidance goals (e.g., Kaplan et al., 2002; Middleton & Midgley, 1997). Given that performance-avoidance goals represent a form of avoidance motivation (Elliot, 1999) and that low academic competence perceptions lead to avoidance motivation (Elliot, 1999; Greene et al., 2004), why then high efficacious students in this study strive to avoid the demonstration of lack of academic competence? Xiang, Lee, and Shen (2001) suggested that achievement goal theory might be relevant across cultures, but the related cognitions may vary as a function of cultural background. As such, the emphasis on achievement and competitive learning climate in the educational system of Oman (Alkharusi, 2010) may lead Omani students to avoid performing poorly in front of others. This cultural and social background might also explain the positive correlations among the three types of achievement goals. Therefore, results of the present study suggest that educators may need to become aware that students with high levels of efficacy may be vulnerable to the negative consequences (e.g., reduced intrinsic motivation) of pursuing performance-avoidance goals (Elliot, 1999) in classes social comparisons in academic achievement are more prevalent.

Although the reliability estimates for the scores on the achievement goal orientation scales (α ranged from .54 to .75) found in this study were lower than those reported by Midgely et al. (2000) for the original versions of the scales (α ranged from .74 to .89), the corresponding standard errors of measurement in this study (*SEMs* ranged from .22 to .47) were approximately similar to their original versions (*SEMs* ranged from .34 to .35) reported in Midgley et al.'s (2000) study. Therefore, in accord with classical measurement theory, this suggests that a lower reliability estimate does not necessarily mean that there is less accuracy around individuals' scores (Crocker & Algina, 1986). One possible explanation for the difference in score reliability for achievement goal orientation scales used in this study and those used in Midgley et al.'s (2000) study is the reduction in the scales' anchors. In this study, achievement goal orientations were measured using a 4-point scale following Assor and Connell's (1992) recommendation when

using self-report measures designed for elementary, middle, and high school students. In contrast, Midgley et al. (2000) measured achievement goal orientations using a 5-point scale. The reduction in the number of response options might have reduced the variability and as a consequence might have contributed to the lower reliability estimates (DeVellis, 2003).

Another possible explanation for the low internal consistency estimates found in this study for the scores from the achievement goal orientation scales when compared to their original versions (Midgley et al., 2000) was that the items of these scales were based on theory and research developed in the United States and published in English-language journals and manuals. Even though the translation of the items into Arabic was verified by bilingual professors and that the translated items were subjected to a content validation process, some of the items and/or instructions might not have been clear, causing students to misinterpret the items and respond on some basis unrelated to the content being measured, thereby lowering the internal consistency of the responses (Crocker & Algina, 1986).

To sum, the present study represents an attempt to testify the applicability of the achievement goal theory in a culture that is different from where it was originally developed. Although the psychometric properties in terms of zero-order correlations and score reliability of the achievement goal orientation scales for the ninth grade students in Oman contrasted to those reported for middle school students in the United States, the general components of the trichotomous framework of achievement goal theory (Midgley et al., 2000) seem to apply equally in both cultures. The current study contributes not only to the validation of the trichotomous framework of achievement goal theory in the Omani culture, but also found relations among the achievement goals and academic self-efficacy. The study also developed validated scales in the Arabic version, which in turn, offer opportunities for future empirical studies in the Arab societies. Finally, reliability generalization studies (Vacha-Haase, 1998) might need to be conducted in the future to empirically examine the factors that might influence score reliability for achievement goal orientation scales across diverse samples.

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