Structural Relations among Goal Orientations, Self-Efficacy, Metacognition and Acheivement: Invariance Across Gender

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The purpose of this study was to examine the structural relations between mastery and performance goal orientations, and their relations with self-efficacy, metacognition and achievement. Also, invariance across gender was tested. Four hundred three students (200 boys and 203 girls) from the United Arab Emirates University and Al Ain University participated in the study. Motivated Strategies for Learning Questionnaire (MSLQ) was administered to the sample in the classes. Only four subscales (form 13 originally included in MSLQ) were used. Alpha Cronbach estimates were adequate for each of the scales used in this study (all above 0.75). GPA scores were obtained from the students.

SEM results indicated a good model fit to data for each of the two gender groups. The invariance test indicated that factor loadings were invariant across gender; however, the invariance of other parameters across gender (e.g., variances and covariances, regression weights, and residuals) was not strongly supported. Mastery orientation correlated with performance orientation for boys but not for girls. Mastery orientation had significant paths to self-efficacy, metacognition, and GPA for both genders. Performance orientation significantly predicted self-efficacy and metacognition for boys but did not for girls. Metacognition predicted achievement (GPA) for boys but not for girls. Self-efficacy predicted GPA for girls but not for boys. For girls, performance orientation had a negative link with GPA but no significant link for boys. The four constructs explained 29% of the variance in GPA scores for boys and 43% for girls. The results concerning male vs. female were interpreted and discussed within a socio-cultural context.

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العلاقات بين توجهات الأهداف والفعالية الذاتية وعمليات ما بعد التفكير والتحصيل الدراسي: التشابه حسب النوع

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هدفت الدراسة الحالية إلى اختبار العلاقات البنائية بين أهداف الإتقان وأهداف الإنجاز والفعالية الذاتية ، وعلميات ما بعد التفكير والتحصيل الدراسي. كما سعت إلى اختبار التشابه في نمط ومقدار هذه العلاقات حسب الجنس. وقد شارك في الدراسة الحالية (ن = ٤٠٣) ٢٠٠ طالب و ٢٠٣ طالبة من جامعة الإمارات العربية المتحدة وجامعة العين. وقد تم تطبيق استبيان الاستراتيجيات الدافعة للتعلم (MDLQ). ولأغراض الدراسة الحالية تم استخدام بيانات أربعة مقاييس فرعية (من أصل ١٣ مقياس). كانت معاملات ألفا جيدة إذ زادت كلها عن ٠.٧٥ . تم الحصول على المعدلات التراكمية من الطلبة أنفسهم.

وقد بينت نتائج الدراسة أن النموذج المقترح ملائم للبيانات للجنسين كل على حدة. كما بينت نتائج عدم الاختلاف (التشابه) بين الجنسين أن معاملات التشبع كانت متشابهة بين الجنسين. ولكن لم تدعم نتائج الدراسة عدم اختلاف المعالم الأخرى (التباين والارتباطات ومعاملات المسار والبواقي). وقد بينت النتائج أن أهداف الإتقان ارتبطت بعلاقة موجبة مع أهداف الإنجاز لدى الطالبات ولكن ليس لدى الطلاب. كما كان لأهداف الإتقان تأثير جوهري على الفعالية الذاتية وعمليات ما بعد التفكير والتحصيل الدراسي لكل من الطلاب والطالبات. أما أهداف الإنجاز فقد كان لها تأثير جوهري على الفعالية الذاتية وعمليات ما بعد التفكير لدى الطلاب ولكن ليس لدى الطالبات. كما كان للفعالية الذاتية تأثير جوهري على التحصيل الدراسي لدى الطالبات ولكن ليس لدى الطلاب. وكان تأثير أهداف الإنجاز على التحصيل الدراسي للطالبات سالباً ولكن لم يكن لها تأثير على تحصيل الطلاب. وفسّر النموذج ما مقداره ٢٩٪ من التباين في تحصيل الطلاب و٤٣٪ من التباين في تحصيل الطالبات. وقد قدمت الدراسة الحالية مناقشة لنتائج الدراسة في سياقها الثقافي الاجتماعي.

Goal Theory: Mastery and Performance Orientations

The development of goal theory has provided a valuable framework for understanding students' efforts to learn and achieve (Ames & Archer, 1988, Dweck, 2000; Pintrich & De Groot, 1990). Achievement goal theorists (e.g., Ames & Ames, 1984; Ames & Archer, 1988; Dweck, 2000; Ford & Nicholls, 1991; Nicholls, 1984, Thorkildsen & Nicholls, 1998) propose that students adopt different types of goals in achievement settings. Ford and Nicholls (1991) indicated that goals represent a core component of motivation. Also, goal theory claims that different goal orientations activate different cognition, emotions and behavioral patterns of individuals in achievement settings.

Researchers in the area of goal orientations distinguish between two kinds of goal orientations: (a) mastery goal orientations (sometimes called task-involved or learning goals, or intrinsic orientations) "represent desires to achieve outcomes derived from the actual process of learning" (Wentzel, 1998, p.202) or to develop competence; and (b) performance goal orientations (sometimes called ego-involved goals or extrinsic orientations) that "represent desires to achieve outcomes derived from personal expectations or values associated with the consequences of task engagement" (Wentzel, 1998, p. 202) or to demonstrate competence. Students who are mastery-oriented judge their ability in a self-referent manner and feel satisfied when they improve. Whilst, students who adopt performance goals are usually concerned with how they perform relative to others, and with what will result from doing the task (praise or punishment). In other words, they use social or external reference as judgment of their abilities. As such, researchers of goal theory have conceived that learning and performance goals are two distinct, orthogonal constructs (Ames & Archer, 1988; Dai, 2000; Nicholls, 1984; Robins & Pals, 2002; Wentzel, 1998). Theoretically, "goal theory has traditionally viewed mastery and performance goals in opposition to one another." (Pintrich, 2000, p. 99) Empirically, however, researchers have found that "mastery and performance goals may be negatively correlated, uncorrelated, or even positively correlated." (Pintrich, 2000, p. 99, also, see: Adie, Duda, & Ntoumanis, 2008, Elliot and Church, 1997, Marsh, Craven, McInerney, and Debus, 2000). Pintrich (2000) recommended that the correlation between mastery and performance goals needs to be further investigated and clarified.

The predominant perspective among the goal theory researchers is the dichotomous perspective which argues that students with mastery goal orientation will demonstrate more adaptive cognition, metacognition, emotion, behavior towards learning as well as higher achievement than students who are performance orientated (Dweck, 1986; Dweck & Leggett, 1988). New developments in the goal theory, however, call for a multiple goal perspective. Dai (2000) and Smith and Sinclair (2005) provided empirical evidence in support of the multiple goal perspective. Smith and Sinclair found that students who espoused task and performance orientations were significantly more self-regulated than those who adopted a single orientation whether mastery or performance; and they demonstrated lower self-handicapping score. Also, Smith and Sinclair reported that students who coupled mastery orientation with performance orientation, experienced lower levels of affective distress than students who adopted a single orientation.

Dispositional vs. contextual orientations

Some researchers argue that these orientations are reasonably stable dispositions (e.g., Marsh et al, 2000, Kaplan & Maehr, 2007, Murphy & Alexander, 2000, Wolters, Yu, & Pintrich, 1996). Kaplan & Maehr, (2007), for example, stated that "goal orientations have been conceived of as more enduring dispositions towards engagement." (p. 142).

Ames (1992), on the other hand, suggested that adopting mastery or performance goals does not fully depend on personal preferences and traits. Adopting either kind of goals is strongly associated with the structure of the environment (such as the classroom structure). Butler (1992) found that high achieving students, who sit in classes

that promote competition, may adopt performance goals. Wentzel (1998) emphasized the roles of teacher and parents as to what kind of goals children would adopt. Using experimentation, Dweck (2000) proved this point and found that students behave according to the way they are oriented. Pintrich (2000) concluded that "goals are not traits in the classic personality sense. They are cognitive representations and may show both intraindividual stability as well as contextual sensitivity." (p. 103).

Goal theory and social cognitive theory

Social cognitive theory views individuals as active agents of learning rather than being completely passively regulated by external forces from the environment (Stipek, 1998). Zimmerman (1989) stated that self-regulated learners are individuals who are "metacognitively, motivationally, and behaviorally active participants in their own learning process" (p. 4). In the motivational research under the framework of goal theory, effects of self-efficacy or perceived competence is frequently discussed and examined with goal orientations (Dweck, 1986; Miller, Behrens, Greene, & De Newman, 1993). Social cognitive theorists stress goal orientations (Dweck, 1986), self-efficacy beliefs and self-regulated learning as significant predictors of academic performance. Bandura (1986) claims that cognition, such as self-efficacy, exerts an influence on human behavior. In achievement settings, perceived competence can affect individuals' thoughts, beliefs, affective reactions and behavior. Some researchers argued that goals and self-efficacy will jointly influence the types of learning strategies and other affective variables such as choice and persistence (see Dai, 2000). Research within this theory has shown that self-regulated learners approach academic tasks more strategically, with more confidence, with more positive attitudes and achieve more; and are more likely to use self-regulated strategies when they believe they have higher self-efficacy and interest (Zimmerman, Bandura, & Martinez-Pons, 1992, Zimmerman & Martinez-Pons, 1986). Social cognitive theorists (e.g., Zimmerman, 1990, 1998;

Winne, 1995; Butler & Winne, 1995) indicated that self-regulated learning is a pivotal contributor to academic success as well as a highly desired educational outcome. As the definition of self-regulated learning suggests, all self-regulated behavior is goal-directed. Also, a main feature of self-regulated learning is **metacognition**. Therefore, it is reasonable to think that goal orientations might function as a psychological impetus that drives self-regulation. Therefore, it is logical to think that goals may be a more immediate and critical catalyst that activates self-regulation.

Effects of goals on motivational constructs

Researchers have found that the effects of mastery orientation on self-efficacy, cognition, metacognition and performance are clear (e.g., Kaplan and Midgley, 1997, Nolen, 1988, Wigfield, Eccles and Rodriguez, 1998). However, the evidence for the influence of performance orientation on self-efficacy, self-regulation and other adaptive patterns of achievement motivation is not so clear (Murphy and Alexander, 2000, Pintrich, 2000). Kaplan and Midgley (1997) found little support for the role of self-efficacy as a moderator between ego-involved goal orientation and patterns of behavior; but found that students' perceived competence had a mediating effect in the task-involved goal condition. Some researchers (e.g., Pintrich, 2000) have argued, contrary to the results of many studies, that the students who adopt performance goal orientations are also highly efficacious, highly self-regulated and perform well academically. Smith and Sinclair (2005) stated: "other research outcomes have indicated either neutral association or negative association between the performance-approach goal, academic self-efficacy, self-regulation and performance." (p. 56). Pintrich (2000) explained that the positive effects of mastery and performance orientations happen when there is a single general criterion measure of performance; however, the tow orientations may have differential effects if different criterion measures of achievement are used.

Archer (1994) examined the effects of mastery goal orientation, ego goal orientation

and perceived competence on first year college students' willingness to deal with difficult tasks, and their effective use of metacognitive strategies; and found that the students with mastery goal orientation, despite their perceived competence, demonstrated more positive attitude, more willingness to face difficulties, and more effective use of strategies. Harackiewicz, Barron, Carter, Lehto, & Elliot's (1997) results showed that students adopting mastery goal orientation were more interested in the course; however, students adopting ego goal orientation obtained better course grades. Nolen (1988) indicated that learning goals are associated with comprehensive and deep learning, and critical thinking; while performance goals are associated with doing what it takes to obtain high scores. These contradictory results leave the door wide open for research into the effect of goal orientations on self-efficacy, self-regulation and performance.

Gender differences

Boys and girls in the Arab world are differently socialized. The social, cultural and educational contexts that they live among are somewhat different from those in the west. As far as motivation and responsibility are concerned, boys and girls, in the Arab culture, are not reared and treated equally. Also, social norms and standards in the Arab culture have strong impact on the individual's behavior and conduct. There are special norms for the boy and other norms for the girl. The Arab family is more interested in norms of success when the boy is involved but more interested in norms of honor when the girl is involved. The Arab boy is expected to have goals to fulfill the standards expected of him; and the girl is expected to have different goals to fulfill the standards expected of her. Consequently, it is expected that the boy may have more inclination toward performance goals that have social component, and the girl may have more inclination toward mastery goals. The results of research in the west are not consistent in this regard. Also, the effects of mastery and performance goals on self-perception of ability, metacognition and performance across gender are not consistent

either. (Dai, 2000, Meece, Blumenfeld, & Hoyle, 1988). McWhaw and Abrami (2001) and Meece, Blumenfeld, & Hoyle (1988) found that students with mastery goal orientation reported a higher level of cognitive engagement (e.g. cognitive strategy use) and metacognition. However, a difference existed between boys and girls, with the mastery goal orientation affecting girls more than boys and performance goals affecting boys more. Nolen (1988) found girls to be more inclined to a mastery orientation, and boys were more inclined to a performance orientation.

Literature in Arabic reveals scarce research in the areas of goal orientations, self-efficacy, metacognition and self-regulation (Abu-Hilal, 2008, Abu-Hilal & Darweesh, 2005, Albaili, 1998). Abu-Hilal (2008), Abu-hilal and Darweesh (2005), and Al-Emadi (2001) reported interesting results. Correlations between mastery and performance goals were all significantly positive ranging from .29 (Al-Emadi, 2001) to .68 for primary and middle school students (Abu-Hilal & Darweesh, 2005). Abu-Hilal (2008) reported significant positive correlation of .24 between mastery and performance orientations for college students with Elliot and Church's (1997) measure; a close to zero correlation (.06) with Marsh et al's (2000) measure. For school students, a large difference in correlation existed between boys (-.45) and girls (.36). Abu-Hilal and Darweesh (2005) reported a positive correlation of .45 and .37 for college boys and girls, respectively.

The model of Pintrich and his colleagues (Carcia & Pintrich, 1994; Pintrich & De Groot, 1990, Pintrich, Smith, Garcı´a, & McKeachie, 1993b) embraces the principles of social cognitive theory, goal theory and information processing theory. The model posits that self-regulated learning has two basic strategies: motivational strategies and learning strategies. Motivational strategies are those used by students to cope with stress and emotions that accompany the pursuit of good learning. Learning strategies, on the other hand, are methods used by students to improve learning and understanding. Pintrich and his colleagues built the Motivated Strategies for Learning Questionnaire (MSLQ) that tap three motivational strategy

components (value, expectancy and affective) and two learning strategy components (cognitive and metacognitive strategies and resource management strategies). For the purpose of this study, two subscales of the value component (mastery and performance goal orientations); one subscale of the expectancy component (self-efficacy); and one learning strategy component (metacognitive self-regulation) are included.

Grounded in social cognitive theory and achievement goal framework (Elliot, 2005; Elliot & McGregor, 2001), this study aims to test the relationships among goals orientations; and the influence of goal orientations on self-efficacy, metacognition, and achievement. Based on the literature, we propose that mastery orientation would positively predict self-efficacy, metacognition and achievement. Performance orientation would negatively predict self-efficacy, metacognition and achievement. Self-efficacy would positively predict metacognition and achievement. Finally, metacognition would positively predict achievement. We tested the degree to which these relationships in the hypothesized model were equivalent for male and female students. Gender invariance of the hypothesized model was investigated based on the postulate that variations and associations among achievement, goals orientations, self-efficacy, and metacognition, are influenced by gender (Dai, 2000, Elliot, 1999). Previous work has revealed mean differences in the emphasis placed on mastery and performance goals, in achievement, and self-efficacy between male and female populations (e.g., Abu-Hilal, 2004; Abu-Hilal & Darweesh, 2005; Dai, 2000, McGregor & Elliot, 2002).

Method
Participants

The sample consisted of 402 college students from Al Ain University of Science and Technology and the United Arab Emirates University. Enrolled in general education courses taught by the authors, 200 female students and 203 males participated in the study. The MSLQ was administered to students in classes where clear instructions were given to students.

Measures

For the purpose of this study an instrument comprising four subscales were used. These subscales are parts of the Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich & De Groot, 1990, Pintrich, Smith, Garcı́a, & McKeachie 1993a). The MSLQ was developed using a social cognitive view of motivation and self-regulated learning. Self-regulated learning is defined as one is being metacognitively, motivationally, and behaviorally active in one's own learning processes and in achieving one's own goals.

MSLQ is a self-reported instrument. Responses were scored using a 7-point Likert type scale, from 1 (not at all true of me) to 7 (very true of me). The instrument was translated to Arabic and back translated to English. Translation and back translation was assessed by 5 faculty members who are fluent in both languages and the assessment confirmed the adequacy of the translation process. Alpha coefficients were computed for each subscale and will be presented next, along with a description of each subscale.

1. Performance goal orientation or as called by Pintrich et al., (1993a) "Extrinsic goal orientation" encompasses four items. "This orientation concerns the degree to which the student perceives him/herself to be participating in a task for reasons such as grades, rewards, performance, evaluation by others, and competition." (Pintrich et al., 1993a, p. 11). The computed alpha was .72. Example of items: 'Getting a good grade in this class is the most satisfying thing for me right now.'

2. Mastery goal orientation comprises four items and relates to students' reasons for participating in a task. The reasons cited may be challenge, curiosity, and mastery. Having a mastery goal orientation towards an academic task indicates that the student's participation in the task is an end all to itself, rather than participation being a means to an end. Alpha for this subscale was .75.

Example of items: 'The most satisfying thing for me in this course is trying to understand the content as thoroughly as possible.'

3. Self-efficacy comprises 8 items and purports to assess two aspects of expectancy: expectancy for success and self-efficacy. Self-efficacy is a self-appraisal of one's ability to master a task. Self-efficacy includes judgments about one's ability to accomplish a task as well as one's confidence in one's skills to perform that task. Alpha for this scale was .88. Example of items: 'I'm confident I can understand the most complex material presented by the instructor in this course.'

4. Metacognitive self-regulation comprises 12 items. Metacognition refers to the awareness, knowledge, and control of cognition. Metacognition is made up of three processes: planning, monitoring, and regulating. Planning activities such as goal setting and task analysis help to activate, or prime, relevant aspects of prior knowledge that make organizing and comprehending the material easier. Cronbach alpha was .85. Example of items: 'If course materials are difficult to understand, I change the way I read the material.'

Structural model and data analysis

The model in this study encompasses four parts. The first part is made of the exogenous latent factors: mastery goal orientations, and performance goal orientations that are assumed to be correlated. The second part encompasses one endogenous latent construct, self-efficacy. This construct is assumed to be influenced by the two goal orientations and at the same time predicts metacognition and GPA. The third part is made of another endogenous construct, metacognition, which is assumed to be influenced by the tow exogenous constructs and self-efficacy and predicts GPA. Finally, GPA represents an endogenous variable that is assumed to be dependent on the tow exogenous and the two endogenous constructs. This model was tested by the SEM with AMOS 16. Figure 1 depicts the model as specified above.

The analysis was performed using parcels rather than single items for self-efficacy (4 parcels), and metacognition (3 parcels). Mastery and performance goal orientations were analyzed with non-parceled items (4 items for each). GPA was obtained from students as part of personal and demographic data, and not from official records.

Results

Descriptive statistics

Table 1 presents the zero correlations, means and standard deviations of the study variable for boys and girls. In Table 1, above diagonal values are of the boys and values below diagonal are of girls. Mastery and performance orientations were uncorrelated for boys and significantly correlated for girls. For girls, mastery orientation was more strongly correlated with other constructs than for boys. Performance orientation was nearly uncorrelated with other constructs for girls, but significantly correlated with the other constructs for boys. Metacognition, self-efficacy and GPA were significantly correlated for boys and girls. Girls, on the average scored higher –though not necessarily significantly- than boys in all variables used in the study except for performance orientation. Variability of constructs was fairly similar across gender.

Table 1. Zero Correlations, Means and Standard Deviations of the Study Variables.

	1	2	3	4	5	Mean	S.D.
1. Mastery	--	.055	.347**	.382**	.341**	4.55	1.33
2. Performance	.206**	--	.239**	.163*	.181**	5.80	1.24
3. Metacognition	.531**	.092	--	.510**	.442**	4.81	.99
4. Self-Efficacy	.471**	.099	.526**	--	.369**	5.16	1.09

5. GPA	.453**	.001	.483**	.457**	--	2.27	.52
Mean	4.80	5.66	5.12	5.43	2.62	
S.D.	2.37	1.18	1.01	1.09	.67	

Note. Values above diagonal for boys, below for girls.
* p < .05, ** p < .01

Factorial structure of the scales

Before testing the structural component of the hypothesized model, we examined the factorial structure of each scale across the two gender groups simultaneously. The maximum likelihood method was used to analyze the data. Because the χ^2 statistic is widely known to be sensitive to sample size, we also evaluated model fit using the comparative fit index (CFI), the Tucker-Lewis index (TLI) and the root mean square error of approximation (RMSEA). According to Hu and Bentler (1999), a good model fit is indicated by CFI and TLI values close to or above .95, and when the RMSEA value is ideally below .10.

Confirmatory factor analyses (CFA) indicated that the scales tapping the following constructs should be revised: mastery orientation, χ^2 = 27.61 (7), p < .01; CFI = .952; TLI = .89; RMSEA = .08; and performance orientation, χ^2 = 49.51 (7), p < .001; CFI = .895; TLI = .819; RMSEA = .119. Based on inspection of the standardized residual matrix and the modification indices, residuals for some items were freed to correlate with other residuals of some other items and the tow separate factor models were reevaluated. Following these revisions, the tow modified scales along with the other scales used in the study provided good fit indices (see Table 2).

Table 2. Simultaneous Analysis of Invariant Loadings across Gender, Goodness of Fit Indices of the Latent Factors

Latent factor	χ^2	df	CFI	TLI	RMSEA
Mastery	10.338	5	.970	.988	.050
Performance	4.260	3	.997	.998	.031
Self-efficacy	14.928	7	.989	.982	.051
Metacognition	31.686	23	.979	.985	.030

Note. CFI: comparative fit index; TLI: Tucker-Lewis index; RMSEA: root mean square error of approximation.

The hypothesized model

Examination of the hypothesized model showed a satisfactory fit: χ^2 = 264.536 (95), p < .001; CFI = .933; TLI = .916; RMSEA = .064. The modification indices, however, suggested freeing the correlation between residuals of the first two items of the mastery orientation and that between the residuals of the first two items of the performance orientation. After these slight revisions, the model was re-

estimated, and produced a good fit to the data: χ^2 = 185.335 (93), p < .001; CFI = .964; TLI = .953; RMSEA = .048. Since we assume a priori that the structural relations among the constructs in this study may not be equal for

boys and girls, the presentation of relationships for the whole sample may not make much sense. Therefore, we will present the test of invariance across gender.

Testing gender invariance

The next part of the analysis was to discern the extent to which the hypothesized revised model was invariant across gender. A series of progressive steps outlined by Bentler (1995) were followed. SEM multisample analysis begins by establishing a good-fitting model separately for the different groups. Good-fitting model emerged for males and acceptable fitting model for females: $\chi2$ (93) = 151.228 (male)/178.876 (female), p < .001; CFI = .955/.936; TLI = .941/.917; RMSEA = .052/.068.

Given no further logical revisions were warranted, the next step was to run an unconstrained model simultaneously for the male and female groups (model 1 in Table 3). This step serves as a baseline for testing the equality of parameter constraints in subsequently increasingly restrictive nested models (Table 3).

After establishing a good-fitting baseline model (χ^2 = 330.122 (186), p < .001; CFI = .945; TLI = .929; RMSEA = .042), a model constraining the equality of factor loadings across gender (model 2) was tested and produced an acceptable fit (χ^2 = 357.024 (197), p < .001; CFI = .939; TLI = .926; RMSEA = .043). Next, the equality of the regression paths were tested (model 3) but gender invariance was not strongly supported, χ^2 = 448.100 (222), p < .001; CFI = .914; TLI = .907; RMSEA = .049. The covariances of the latent factors were the next set of constraints imposed and the results revealed a less satisfactory model fit, χ^2 = 461.849(227) CFI = .910; TLI = .905; RMSEA = .049. Finally, the constraints of equality were imposed on the structural variances across gender (model 5) but results did not strongly support gender invariance (χ^2 = 462.230 (229), CFI = .911, TLI = .907, RMSEA = .051).

Figure 1 shows the regression paths and the correlation between mastery and performance orientations of the simultaneous

analysis that assumed equality of factor loadings to be correct. Values for males are presented first and values for females are in parentheses.

Coefficients for male students. The correlation between mastery and performance orientations was .17 (ns). The path coefficients from mastery orientation to: self-efficacy, metacognition, and GPA were .45, *p.* < .01, .18, *p* <.01, and .23, *p* < .01, respectively. The path coefficients from performance orientation to self-efficacy and metacognition were .22, *p* < .05 and .24, *p* < .01, respectively. The path coefficient from performance to GPA was .10 (*ns*). Self-efficacy didn't have a significant direct link with GPA but had an indirect effect on GPA via metacognition. The path coefficient from metacognition to GPA was .33, < .01. The variances explained in each of the endogenous factors: self-efficacy, metacognition and GPA, were 27%, 50% and 29%, respectively.

Coefficients for female students. The correlation between mastery and performance orientations was .37 (*p* < .01). The path coefficients from mastery orientation to self-efficacy, metacognition and GPA were .53, .52, .43, respectively. They were all significant (*p* < .01). As can be easily noticed, these values are similar in pattern for boys and girls but different in magnitude. The path coefficient from performance orientation to self-efficacy and to metacognition were not significant; but the path coefficient from performance orientation to GPA was negatively significant (-.27, *p* < .01). That is female students who were high on performance orientation were low on achievement and those who were low on performance orientation were high on achievement. Self-efficacy had a significant direct link with GPA (.24, *p* < .05). The path coefficient from metacognition to GPA was not significant. The variances explained in each of the endogenous factors: self-efficacy, metacognition and GPA, were 29%, 64% and 43%, respectively.
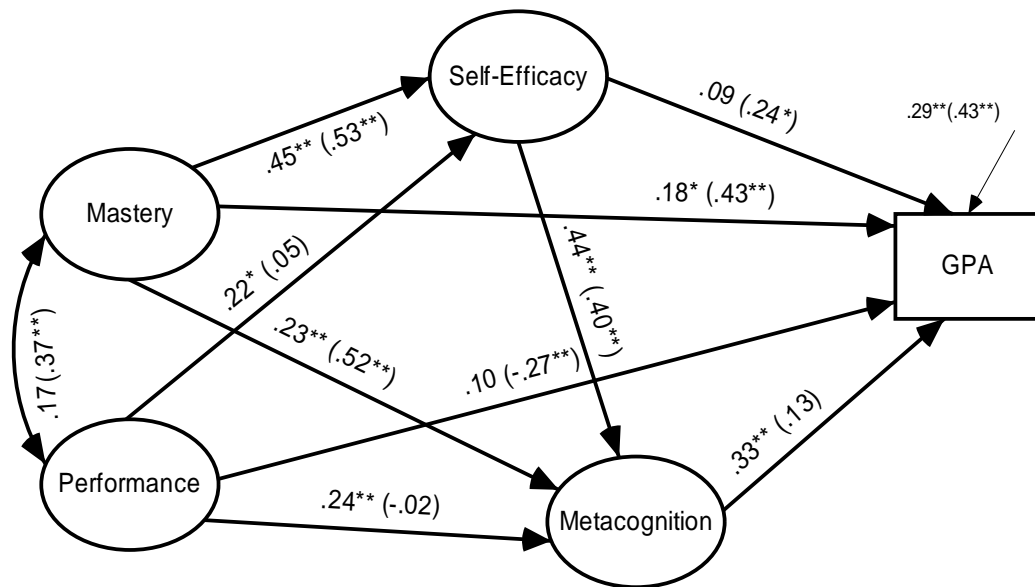
Figure 1. The slightly revised model showing the relationships among goals orientations, self-efficacy, metacognition and achievement (values for girls in parenthases).

Note. All coefficients presented are standardized. Not visually presented are: variance explained in latent endogenous constructs of self-efficacy (28% boys, 31% girls) and metacognition (48% boys, 64% girls); the correlated residuals of indicators 1 and 2 of the mastery orientation (.08, boys, .47 girls); and indicators 1 and 2 of the performance orientation (.64, boys, .49 girls).
* p < .05, ** p < .01

Table 3. Goodness of Fit Indices of Simultaneous Analysis of Invariance across Gender

Models	χ^2	df	CFI	TLI	RMSEA
1. unconstrained	330.122	186	.945	.929	.042
2. Factor Loadings invariant	357.024	197	.939	.926	.043
3 2+ structural weights inv	448.100	222	.914	.907	.049
4. 3+structural covariances inv	461.849	227	.910	.905	.049
5. 4+structural residuals inv	462.230	229	.911	.907	.051

Note. CFI: comparative fit index; TLI: Tucker-Lewis index; RMSEA: root mean square error of approximation.

Discussion

In this study we set out to examine the relationships among some motivational constructs and achievement and possible gender differences. We were interested in examining the pattern and magnitude of association between mastery and performance orientations and their impacts on self perception of ability, metacognition and achievement. The results indicated that the correlation between the two orientations was positive but marginally significant. When the correlation was estimated for each gender group, the correlation for girls was significant but not for boys. The correlation for girls

confirmed the results of Abu-Hilal and Darweesh (2005); but contradicted those of Abu Hilal & Darweesh and Al Emadi (2003)

who found a significant positive correlation between mastery and performance orientations for boys. The results of this study confirm that the correlation between mastery and performance orientations is dependent on the measure employed, the method of analysis, and demographic characteristics of the sample used.

The results of this study indicated significant positive associations of mastery

orientation with subsequent motivational constructs (i.e., self-efficacy, metacognition) and achievement. Our results are consistent with the western findings from laboratory and field studies that students high on mastery orientation are self-efficacious, use more self-regulated learning strategies, and achieve better than students who are low on this orientation (Dweck, 1986, 2000, Pintrich, 2000). This is true for both gender groups; nonetheless, the associations of mastery orientation with subsequent constructs were stronger for girls than for boys (Meece et al., 1988, Nolen, 1988). It is probably important and useful to make the learning environment as task oriented as possible since such environment may lead to more self-efficacy and use of metacognitive strategies. These constructs are desirable outcomes as well as prerequisites of better achievement.

Abu Hilal and Darweesh (2005) argued that, compared to Arab girls, Arab boys are subject to a greater social pressure to succeed in school. Also, the educational system in many Arab states focuses on competitive and normative grading than on learning (Barakat, 1993, Sharabi, 1975). The social pressure impinged on boys, but less on girls, with regard to academic success seems to disadvantage boys and advantage girls. Girls may have more space to focus on learning than competing for grades, university seats, and jobs later on. Since girls are expected to be dependents on their families and husbands, when married, are under no pressure to go to college or have a job. In fact, many are expected to get married earlier than the age of college, especially in rural and Bedouin areas. In support of this argument, the descriptive statistics revealed that girls scored higher on mastery orientation while boys scored higher on performance orientation.

Contrary to Abu Hilal (2004) and Al Emadi (2003), who found no significant association between mastery orientation and achievement, the present study revealed a significant path coefficient (.23, p <.01) from mastery to achievement (GPA) for the model of boys and girls combined. Also, consistent with Abu Hilal (2004), Abu Hilal and Darweesh (2005), and Al Emadi (2003), the path from performance orientation to GPA

was not significant for boys and girls combined. The path linking performance orientation and GPA for girls, however, was negatively significant.

The results of this study provide support to the findings of social cognitive researchers that individuals are more likely to use self-regulated strategies when they adopt mastery goals and believe they have higher self-efficacy (Zimmerman & Martinez-Pons, 1986, Zimmerman et al, 1992); and provide support to western researchers (Archer, 1994, Kaplan and Midgley, 1997, McWhaw & Abrami, 2001, Meece et al., 1988) that students with mastery goal orientation have higher level of cognitive engagement and metacognition. Also, our results confirm the effect of mastery orientation on metacognition self-regulation, self-efficacy and performance as the support was consistent across both gender groups.

As for performance orientation, consistent with previous research, the evidence of the influence of performance orientation on self-efficacy, self-regulation and other adaptive patterns of achievement motivation is not so clear. It seems that performance orientation, as in previous studies, may still have an ambiguous role within the motivational network and within a non-western socio-cultural context. For example, Kaplan and Midgley (1997) found little support for the role of self-efficacy as a moderator between performance goal orientation and patterns of behavior (i.e., achievement). Our results, however, provide partial support to research that indicated either neutral association or negative association between the performance-approach goal, academic self-efficacy, self-regulation and performance (e.g., Smith & Sinclair, 2005). Our results provide partial support to Elliot and Church's (1997) and Pintrich's (2000) argument that performance oriented students are self-efficacious, self-regulated and high achievers. This argument holds for boys but not for girls. Boys who were high on performance orientation were also high on self-efficacy and metacognition. However, in support of Smith and Sinclair's (2000) contention, girl's performance orientation was not related to self-efficacy,

and metacognition, but negatively related to achievement. Girls who were less interested in competition and in demonstrating performance were better achievers than girls interested in competition. Also, whether Arab girls were interested in competition or not, this had nothing to do with their perception of ability or with using metacognitive strategies.

Overall, our results support the findings of McWhaw and Abrami (2001) and Meece et al., (1988) who reported that a difference existed between boys and girls, with the mastery goal orientation affecting girls more than boys and performance goals affecting boys more. Our results revealed that mastery orientation was more positively linked to self-efficacy, metacognition, and achievement for girls than for boys. However, performance orientation was more positively strongly related to self-efficacy and metacognition for boys than for girls. Even the indirect relation between performance and achievement was positive for boys but marginally negative for girls. Therefore, the influence of mastery goals on self-efficacy, metacognition strategies and achievement was stronger for girls than for boys. On the other hand, the influence of performance goals on self-efficacy, metacognition, and achievement was stronger for boys than for girls. In fact, adopting performance goals was detrimental to girls' achievement based on the negative path between performance orientation and achievement.

In conclusion, this study partially confirmed some western theoretical tenets about the relationships among goal orientations, self-efficacy, metacognition and achievement. However, some theoretical expectations, particularly those related to performance orientation, have not been clearly supported. Hence, further research with Arab boys and girls at different levels of education should be conducted.

References

Abu-Hilal, M. (July, 2004). *Academic self-concept, goal orientation and achievement: A structural equation model.* Paper presented at the SELF Research Center 3rd Biennial International Conference, Berlin, Germany.

Abu-Hilal, M. (2008). Motivation, attribution of academic experiences and achievement among Arab students within a sociocultural context. In T. O. Seng, D. M. McInerney, A. D. Liem, & T. Ai-Girl (Eds), *Research in Multicultural Education and International Perspective*s (Vol. 7, pp. 217-244). Greenwich, CT: Information Age Publishing.

Abu-Hilal, M., & Darweesh, K. (2005). Factor Structure of Goal Orientations and their Relations with Academic Achievement School and University Students: A Study of Motivation in Social Psychology and Personality Perspectives. *Dirasat (University of Jordan), 32,* 100-114.

Adie, J., Duda, J., & Ntoumanis, N. (2008). Achiememtnt goals, competition appraisals, and the psychological and emotional welfare of sport participants. *Journal of Sports and Exercise Psychology, 30,* 302-322.

Albaili, M. (1998). Goal orientations, cognitive strategies, and academic achievement among United Arab Emirates college students. *Educational Psychology, 18,* 195-203.

Al-Emadi, A. (2001). The relationship among achievement, goal orientation, and study strategies. *Social Behavior and Personality, 29,* 823-832.

Ames, C. (1992). Classrooms: Goals, structures, and student motivation. *Journal of Educational Psychology, 84*(3), 261-271

Ames, C., & Ames, R. (1984).Systems of student and teacher motivation: Toward a qualitative definition. *Journal of Educational Psychology, 76,* 535-556.

Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology, 80,* 260-267.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Englewood Cliffs, NJ: Prentice-Hall.

Barakat, H. (1993). *The Arab world: Society, culture and state.* Berkeley: University of California Press.

Bentler, P. (1995). *EQS: Structural equations program manual* .Encino, CA, Multivariate Software Inc.

Butler, D., & Winne, P. (1995). Feedback and self-regulated learning: A theoretical synthesis. *Review of Educational Research, 65,* 245-281.

Butler, R. (1992). What young people want to know when: Effects of mastery and ability goals on interest in different kinds of social comparison. *Journal of Personality and Social Psychology, 62,* 934-943.

Dai, D. (2000). To be or not to be (challenged), that is the question: Task and ego orientations among high ability, high achieving adolescents. *The Journal of Experimental Education, 68,* 311-330.

Dweck, C. (1986). Motivational processes affecting learning. *American Psychologist, 41,* 1040-1048.

Dweck, C. (2000). *Self-theories: Their role in motivation, personality and development.* Philadelphia: Psychology Press.

Dweck, C., & Leggett, E. (1988). A social-cognitive approach to motivation and personality. *Psychological Review, 95,* 256-273.

Elliot, A.J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist, 34,* 169–189.

Elliot, A.J. (2005). A conceptual history of the achievement goal construct. In A.J. Elliot & C.S. Dweck (Eds.), *Handbook of Competence and Motivation* (pp. 52–73). New York: Guilford Press.

Elliot, A. J., & Church, M. (1997). A hierarchical model of approach and

avoidance achievement motivation. *Journal of Personality and Social Psychology, 72,* 218-232.

Elliot, A.J., & McGregor, H.A. (2001). A 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology, 80,* 501–519.

Ford, M. E., & Nicholls, W. G. (1991). Using goals assessment to identify motivational patterns and facilitates behavioral regulation and achievement. In M. L. Maehr & P. R. Pintrich (Eds.), *Advances in motivation and achievement* (Vol. 7, pp. 51-84), Greenwich, CT: JAI Press Inc.

Harackiewicz, J. M., Barron, K. E., Carter, S. M., Lehto, A. T., & Elliot, A. J. (1997). Predictors and consequences of achievement goals in the college classroom: Maintaining interest and making the grade. *Journal of Personality and Social Psychology, 73,* 1284-1295.

Hu, L., & Bentler, P.M. (1999). Cuttoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling, 6,* 1–55.

Kaplan, A., & Maehr, M. L. (2007). The contributions and prospects of goal orientation theory. *Educational Psychology Review, 19,* 141-184.

Kaplan, A., & Midgley, C. (1997). The effects of achievement goals: Does level of perceived academic competence make a difference? *Contemporary Educational Psychology, 22,* 415-435.

Marsh, H. W., Craven, R. G., McInerney, D., & Debus. (2000, August). *Evaluation of the big-two factor theory of motivation orientations: An evaluation of jingle-jangle fallacies.* Paper presented at the 1st biennial SELF Conference, Sydney, Australia.

McGregor, H.A., & Elliot, A.J. (2002). Achievement goals as predictors of achievement relevant processes prior to task engagement. *Journal of Educational Psychology, 94,* 381–395.

McWhaw, K.& Abrami, P. C. (2001).Student goal orientation and interest: Effects on students' use of self-regulated learning strategies. *Contemporary Educational Psychology, 26,* 311-329.

Meece, J. L., Blumenfeld, P. C., & Hoyle, R. H. (1988). Students' goal orientations and cognitive engagement in classroom activities. *Journal of Educational Psychology, 80,* 514-523.

Miller, R. B., Behrens, J. T., Greene, B. A., & De Newman. (1993). Goals and perceived ability: Impact on student valuing, self-regulation, and persistence. *Contemporary Educational Psychology, 18,* 2-14.

Nicholls, J. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91,* 328-346.

Nolen, S. (1988). Reasons for studying: Motivational orientations and study strategies. *Cognition and Instruction, 5,* 269-287.

Pintrich, P. R. (2000). An achievement goal theory perspective on issues in motivation terminology, theory, and research. *Contemporary Educational Psychology, 25,* 92–104

Pintrich, P.R. & De Groot, E.V. (1990). Motivational and Self-Regulated Learning Components of Classroom Academic Performance. *Journal of Educational Psychology, 82*(1), 33-40.

Pintrich, P. R., Smith, D. A., Garcia, T., & McKeachie W. J. (1993a). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ).* Ann Arbor, MI: University of Michigan.

Pintrich, P. R., Smith D. A., Garcı́a T., McKeachie W. J. (1993b). Reliability and predictive validity of the Motivated Strategies for Learning Questionnaire (MSLQ). *Educational & Psychological Measurement, 3,* 801-813.

Robins, R., & Pals, J. (2002). Implicit self-theories in the academic domain: Implications for goal orientation, attributions, affect, and self-esteem change. *Self and Identity, 1,* 313-336.

Sharabi, H. (1975). *Introduction to the study of the Arab Society.* Jerusalem: Salahueddin Publications.

Smith, L. & Sinclair, K. E. (2005). Empirical Evidence For Multiple Goals: A Gender-Based, Senior High School Student Perspective. *Australian Journal of Educational & Developmental Psychology. 5*, 55 – 70.

Stipek, D. (1998). *Motivation to learn: from theory to practice.* Allyn and Bacon.

Thorkildsen, T., & Nicholls, J. (1998). Fifth graders' achievement orientations and beliefs: Individual and classroom differences. *Journal of Educational Psychology, 90*, 179-201.

Wentzel, K. (1998). Social relationships and motivation in middle school: the role of parents, teachers and peers. *Journal of Educational Psychology, 90*, 202-209.

Wigfield, A., Eccles, J. S., & Rodriguez, D. (1998). The development of Children's motivation in school contexts. *In Review of Research in Education* (*Vol. 23*, pp. 73-118).

Washington, DC: American Educational Research Association.

Wolters, C., Yu, S., & Pintrich, P. R. (1996). The relation between goal orientation and students' motivational beliefs and self-regulated learning. *Learning and Individual Differences, 8*, 211-238.

Zimmerman, B. J. (1990). Self-Regulated Learning and Academic Achievement: An Overview. *Educational Psychologist, 25*(1), 3-17.

Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self-motivation for academic attainment: The role of self-efficacy beliefs and personal goal setting. *American Educational Research Journal, 29*, 663-676.

Zimmerman, B. J. & Martinez-Pons, M. (1986). Development of a structured interview for assessing student use of self-regulated learning strategies. *American Educational Research Journal, 23*, 614-628.