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The relationship among achievement motivation orientations, achievement goals, and academic achievement and interest: A multiple mediation analysis

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ABSTRACT

The aim of the present study is to examine the relationships among achievement motivation orientations and academic achievement and interest and whether achievement goals mediate these relationships. A sample of 503 students aged 14-16 years from 8 secondary schools in two Australia cities responded to a questionnaire package, comprising measures of individual-oriented achievement motivation (IOAM), social-oriented achievement motivation (SOAM), achievement goals, and academic interest. Results of the study showed IOAM and SOAM correlated positively. Students endorsed higher levels of IOAM than SOAM. IOAM correlated positively with a mastery-approach goal whereas SOAM correlated positively with mastery-approach, performance-approach, and performance-avoidance goals. Performance-approach and performance-avoidance goals mediated the relationship between SOAM and academic achievement. Mastery-approach goals mediated the relationship between IOAM and SOAM and academic interest.

Key words: Achievement motivation orientations, achievement goals, academic achievement, interest, multiple mediation model

INTRODUCTION

Everyday exposure to a culture's customs and practices informally socializes individuals to a culture's values and beliefs. Different cultures cultivate different values and beliefs concerning qualities that are important, worth pursuing, and socially desirable. Individuals who acquire these cultural values and beliefs also acquire behaviors which in turn might affect their motivation and achievement (Elliott & Bempechat, 2002; Yu & Yang, 1994).

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Underpinned by this reasoning, Yang and Yu (1988) proposed a two-dimensional model of achievement motivation: (a) individual-oriented achievement motivation (IOAM) and (b) social-oriented achievement motivation (SOAM). IOAM refers to a functionally-autonomized (hence still intrinsic) desire through which the process of achievement-related behaviors, standards of excellence, and evaluation of performance or outcome are defined and determined by persons themselves. SOAM refers to a kind of functionally-non-autonomized (hence still extrinsic or instrumental) desire through which the process of achievement-related behaviors, standards of excellence, and evaluation of performance or outcomes are defined and determined by significant others such as the family, the group, or the society as a whole.

IOAM can be seen as the resultant orientation from socialization within individualistic societies that emphasize independence, whereas SOAM can be seen as the resultant orientation from socialization within collectivistic societies that emphasize dependency (Yang & Yu, 1988; Yu & Yang, 1994). However, it should be noted that collectivism need not prompt only SOAM, nor individualistic cultures prompt only IOAM. For example, might not a student in a collectivistic culture initially be motivated simply by a desire to please parents (i.e., SOAM), but eventually begin to internalize and adopt the parents' goals and feel autonomous in pursuing those goals (i.e., IOAM). In fact, this very idea is foundational to theorizing in the past 10-20 years on cultural differences in intrinsic motivation (see Deci & Ryan, 1985).

One important argument within the framework of the two-dimensional model of achievement motivation (Yang & Yu, 1988) is that different achievement goals, achievement-related responses, and learning outcomes occur depending on whether the perceived standards of excellence are set by students themselves or by significant others (Yang & Yu, 1988). When a student is individually-oriented to achieve, the standards of excellence are set by the student himself or herself, and achievement is experienced as an individual endeavor. However, when a student is socially-oriented to achieve, the standards of excellence are set by significant others, and achievement also signifies fulfilling obligations to significant others. In this case, achievement is seen as a social endeavor (Yu & Yang, 1994). These differences in the perceived standards and meaning of achievement may lead to differential consequences at affective (e.g., academic interest), behavioral (e.g., academic achievement), and cognitive levels (e.g., achievement goals).

Individual-oriented achievement motivation, social-oriented achievement motivation, and academic achievement and interest

According to Eccles and Wigfield (2002), individual interest is conceptualized as consisting of feeling- and value- related valences. Feeling- related valences refer to the feelings that are associated with an object or an activity such as involvement, stimulation, or flow. Value-related valences refer to the attribution of personal significance to an object or activity. Within an academic domain, interest refers to a student's relatively stable or enduring predisposition, positive affective orientation, and tendency to persevere when working on a specific academic content or task domains (Corno, Cronbach, Kupermintz, Lohman, Mandinach, Porteus, & Talbert, 2002; Eccles & Wigfield, 2002; Renninger & Hidi, 2002). Corno et al., (2002) argued that academic interests should not only be considered important facilitators of academic outcomes, but also as valued educational outcomes in their own right because they can improve the quality of learning and promote intrinsic motivation.

Only one study by Chang and Wong (2008) have examined the effect of SOAM endorsement on academic interest in a sample of Chinese university students in Singapore. They used two items to assess students' academic interest: "*I enjoy studying in the university*." and "*I enjoy studying the course I have taken*" and reported that SOAM was not a significant predictor of students' academic interest.

Verkuyten, Thijs, and Canatan (2001) examined the relationship among IOAM, family-oriented achievement motivation (FOAM; conceptually equal SOAM) and academic achievement in three studies with Turkish and Dutch adolescents. Academic achievement was measured by self-reported grades in study 1 and 2 and by actual grades in study 3. They reported that IOAM correlated positively with academic achievement of both ethnic groups in study 1 and 2. FOAM correlated positively with Turkish students' academic achievement in study 1, but it did not relate to academic achievement of both ethnic groups in study 2. In study 3, both IOAM and FOAM correlated positively with Turkish students' academic achievement. More recently, Bernardo (2008) reported that two dimensions of SOAM (parent-oriented and teacher-oriented motivations) and two dimensions of IOAM (personal performance standards and personal goal choice) were not associated with academic achievement in a sample of Filipino university students.

Individual-oriented achievement motivation, social-oriented achievement motivation and achievement goals

As noted above, a limited number of studies have examined the associations among IOAM and SOAM and academic achievement (Bernardo, 2008; Verkuyten et al., 2001) and interest (Chang & Wong, 2008). Accordingly; several important questions remain to be addressed. One important focus for subsequent research is an examination of the specific factors that may contribute to the respective impact of the IOAM and the SOAM dimensions on academic achievement and interest. One potential factor that can contribute to the distinct impact of IOAM and SOAM is the type of achievement goals associated with each of these achievement motivation orientations.

Most authors now point out that goals are best conceived of as aims (Elliot, 2005; Elliot & Thrash, 2001; Van Yperen, 2003), that is, as a "cognitive representation of a competence-based possibility that an individual seeks to attain" (Elliot & Thrash, 2001, p. 144). The achievement goal framework posits that people differ in the extent to which they adopt various goals concerning their achievement behavior and that these differences are associated with distinctive emotional, motivational, cognitive, and behavioral outcomes (e.g., Elliot & Dweck, 2005; Pintrich, 2000). Elliot and McGregor (2001) conceptualized a "2×2 achievement goal framework" involving four goal orientations: the mastery-approach orientation involves striving to learn all there is to learn; the mastery-avoidance orientation involves avoiding failing to learn what there is to learn; the performance-approach orientation involves seeking to perform better than others; and the performance-avoidance orientation involves avoiding poor performance relative to others. Students may adopt multiple goal orientations simultaneously (Pintrich, 2000); as such, the degree to which each orientation is adopted is often the focus of measurement (e.g., Elliot & McGregor, 2001). Studies examining associations between goal orientation scores and indices of achievement-related functioning suggested that approach-oriented goals are associated with a more adaptive profile of functioning than avoidance-oriented goals (Moller & Elliot, 2006).

Some research findings have pointed to a positive relationship between IOAM and a mastery-approach goal and between SOAM and performance-approach and performance-avoidance goals. For example, Tao and Hong (2000, study 2) reported that SOAM correlated positively with a performance goal whereas IOAM correlated positively with a learning goal in a sample of Hong Kong college students. Likewise, Leung (2003), using a sample of Chinese student teachers, reported that IOAM correlated positively with a learning goal. In contrast, SOAM correlated negatively with the learning goal, but at the same time, correlated positively with performance-approach and performance-avoidance goals.

However, these research findings seem to contradict another recent line of theorizing among achievement goal researchers who noted that mastery goals, compared to performance goals, tend to correlate more positively with social desirability concerns (e.g., garner teachers' appreciation),

social goals to succeed at university (i.e., social utility goals), social goals to please teachers, parents, and significant others (i.e., social responsibility goals), social comparisons, and to fit in (i.e., belongingness goals) and cooperativeness. Likewise, students correctly recognize that mastery goals have more social value (i.e., teachers favor mastery-oriented students over performance-oriented students) (see Darnon, Dompnier, Gilliéron, & Butera, 2010; Dompnier, Darnon, and Butera, 2009; Horst, Finney, & Barron, 2007; Regner, Escribe, & Dupeyrat, 2007).

For example, Darnon, Dompnier, Delmas, Pulfrey, and Butera (2009) reported that mastery goals and performance goals corresponds to different aspects of social value. High endorsement of mastery goals was associated with being judged as both likable (i.e., social desirability) and likely to succeed (i.e., social utility goal). High endorsement of performance-approach goals enhanced social utility judgments but reduced perceived likability. Performance-avoidance goals only enhanced perceived likability.

Taking together, these findings suggest that mastery goals, though autonomously chosen, are *sometimes* endorsed for social reasons. That is, one could easily predict that mastery goals correspond to SOAM as much or more than IOAM. Consistent with their notion, Bernardo (2008), using a sample of Filipino university students, reported that personal performance standards motivations (i.e., IOAM) and parent-oriented motivations (i.e., SOAM) were positively associated with a mastery-approach goal. Teacher-oriented and parent-oriented motivations (i.e., SOAM) as well as personal performance standards motivations (i.e., IOAM) were positively related to a performance-approach goal. Parent-oriented and teacher-oriented motivations (i.e., SOAM) were positively related to a performance-avoidance goal. Likewise, Verkuyten et al. (2001) reported a positive relationship between task-goal orientation (i.e., mastery goal) and both IOAM and family-oriented achievement motivation (FOAM; conceptually equal SOAM) in three studies with Turkish and Dutch adolescents.

Achievement goals and academic achievement and interest

Furthermore, different types of achievement goals are known to play a differential role in the promotion of interest and academic achievement. This contemporary formulation of achievement goal theory, known as the specialized goal pattern hypothesis (Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002), proposes that (1) mastery-approach goals should relate to task interest and adaptive self-regulation but not to performance, (2) performance-approach goals should relate to achievement-related outcomes but not to interest and effective self-regulation, and (3) performance-avoidance goals should negatively relate to both achievement and emotional adjustment. Several studies have provided support for this specialized goal pattern hypothesis within area of educational psychology (e.g., Elliot & McGregor, 2001; Senko, Durik, & Harackiewicz, 2008), thus highlighting the importance of measuring both academic achievement and interest to gain a precise understanding of the role of achievement goals in academic achievement and interest.

Aims and rationale of the present study

The present study extends the existent literature in three ways. First, although numerous studies have investigated the relationship among achievement motivation orientations, achievement goals, and academic achievement and interest, these studies are limited in their generalizability, particularly because they have been exclusively carried out on Asian samples which would mean that the relationships shown by these studies might not be true for other samples within other contexts (e.g., Australians).

One possible reason why prior findings might be unique to Asian samples is that achievement goals and academic achievement might operate differently for members of

collectivistic cultures (e.g., Asian) than for members of individualistic cultures (e.g., Australian). For example, Urdan (1997; Urdan & Giancarlo, 2001) argued that definitions of self along the collectivist-individualist dimension might moderate the effects of performance goals. Individuals with collectivist self definitions tend to think of themselves and their accomplishments (e.g., academic achievement) in relational terms, as members of a specific group (i.e., family, clan; McInerney, Roche, McInerney, & Marsh, 1997). As such, collectivists are more inclined to evaluate themselves and their accomplishments with a consideration of how those accomplishments reflect on important in-group members, such as bring honor to the family. In contrast, those with an individualistic definition of self tend to view themselves and their accomplishments (e.g., academic achievement) as distinct from others. As such, individualists tend to think of themselves and their accomplishments in ego-oriented ways such as ego augmentation and feelings of personal pride (Markus, & Kitayama, 1998).

Furthermore, the individualism-collectivism distinction may produce differences in the degree to which students pursue performance-approach and performance-avoidance goals. Individualistic students are believed to be motivated primarily by the goal of feeling personal pride, whereas the collectivist is believed to be motivated by fear of feeling shame (Markus & Kitayama, 1991). Therefore, a student with an independent self construal might be expected to pursue performance-approach goals more frequently than would a student with a collectivist self definition, whereas the opposite pattern would exist for performance-avoidance goals. Partial support was found for this hypothesis in a study by Elliot, Chirkov, Kim, and Sheldon (2001).

Another way by which the present study extends past research is by focusing on high school students. Most of previous studies on achievement motivation orientations have centered primarily on university students (e.g., Bernardo, 2008, Chang & Wong, 2008 Leung, 2003; Tao & Hong, 2000), and therefore, little was known about the effect of cultural values and beliefs on high school students' achievement motivation orientations and how their motivational tendencies and self-regulatory practices were associated with their achievement goals, academic achievement, and interest.

High school is an important place to study the relationships among these variables because it presents an environment that induces significant amounts of stress and has implicit and explicit performance demands (Crosnoe, Riegle-Crumb, & Muller, 2007).

One possible reason why prior findings might be unique to university samples is that previous research has shown that the relative importance students place on achievement goals can vary with the schooling level they are at and that the context of the classroom and the school environment, can promote the adoption of different achievement goals (Ames, 1992). At a broad developmental level, it may be that different goal orientations are more appropriate and adaptive at different points in students' academic lives (Zimmerman & Kitsantas, 1997) and that the relevant orientation guides the student to focus on different skills that are needed to perform the task (see Pintrich, 2000). It has been suggested that as students progress through their schooling and particularly as they move into adolescence, they become more performance oriented (Midgley, 1993).

According to Urdan, Midgley, and Anderman (1998) and Urdan (2004), students' mastery and performance approaches are also linked to their perception of whether the context is mastery goal structured (e.g., teachers emphasize learning and individual progress as yardsticks) or performance goal structured (e.g., teachers emphasize achievement and use explicit social comparisons). This, combined with the fact that high school teachers and students believe the school goal structure is primarily performance focused (Midgley, Anderman, & Hicks, 1995), suggests that high school students compared with university students may evince higher performance orientation.

Finally, previous studies have shown that academic achievement and interest are predicted on several factors including achievement motivation orientations and achievement goals (see .g., Bernardo, 2008; Chang & Wong, 2008; Harackiewicz et al., 2002; Verkuyten, et al., 2001). As these variables are often examined in isolation, our study extends previous research by examining the extent to which these sets of variables co-predict academic achievement and interest. In particular, we examined the possible mediating role of achievement goals between each achievement motivation orientation (i.e., IOAM and SOAM) and academic achievement and interest. The model posits that IOAM and SOAM lead to mastery, performance approach, and performance avoidance goals which in turn lead to academic achievement and interest (see Figure 1). As proposed by Elliot and Church (1997), different achievement motives and other psychological factors (see Elliot, 1999) may exert an indirect effect on achievement outcomes by evoking specific adoption of achievement goals. The adoption of specific achievement goals may in turn serve as a direct predictor of achievement outcomes. To the best of our knowledge, only Verkuyten et al. (2001, study1) found that task-goal orientations (i.e., a desire to achieve purely for the purpose of obtaining knowledge and increasing skills) mediated the relationship between Dutch students' IOAM and Turkish students' FOAM and academic achievement. There are two main mediation hypotheses within the model of the present study:

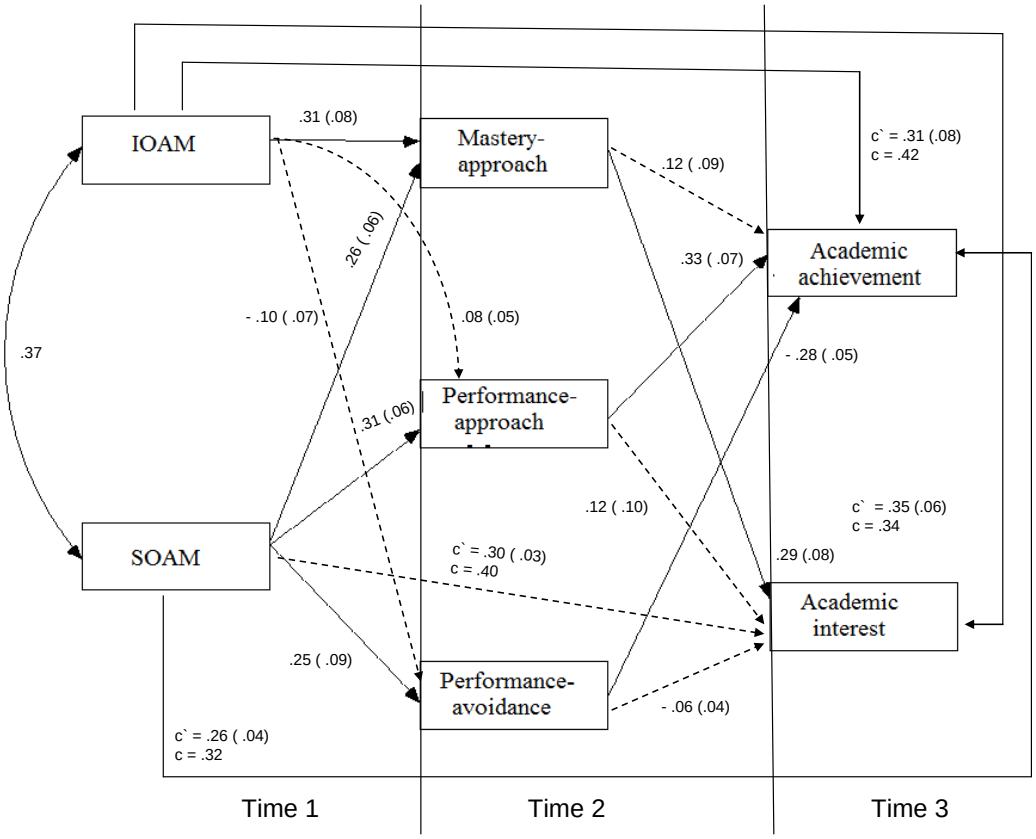

Figure 1. A hypothetical multiple mediation model of the relationship among achievement motivations and academic achievement and interest as mediated by achievement goals

Hypotheses for SOAM

Students who strongly endorse SOAM focus on achieving goals and standards of excellence set by significant others. Outcomes are also evaluated according to whether they met standards set by significant others. Those students are more likely to adopt goals which define competence normatively such as performance-approach and performance-avoidance goals. In line with the specialized goal pattern hypothesis, performance-approach or performance-avoidance goals should positively and negatively respectively predict academic achievement, therefore mediate the relationship between SOAM and academic achievement (*mediation hypothesis 1*).

Hypotheses of IOAM

Students who strongly endorse IOAM focus on achieving goals and standards of excellence set by themselves. Outcomes are evaluated in accordance with their own personal standards. Those students are more likely to adopt goals which define competence in an absolute and intrapersonal way, such as mastery-approach goals. In line with the specialized goal pattern hypothesis, mastery-approach goals should positively predict academic interest; therefore mediate the relationship between IOAM and academic interest (*mediation hypothesis 2*)

METHOD

Participants

Initially, a total of 570, Years 9-11 students were randomly selected from 8 secondary state schools in the capital cities of Perth, Western Australia, and Brisbane, Queensland, to participate in this study. Of the initial sample, 26 students did not complete the Time 2 questionnaire and 41 students did not complete the Time 3 questionnaire, yielding an overall a response rate of 88%. The final sample consisted of 503 students. There were 270 male and 233 female students. The age of the participants ranged from 14 to 16 years (M = 14.6, SD = 1.4).

The high school youths in the present study comprised a representative sample of Australian high school students from schools in the low to high socio-economic status regions as determined by an index defined at the postcode level from the Australian Bureau of Statistics (1998). Four schools were located in low socio-economic status areas, three were in middle socio-economic areas, and three were in high socio-economic areas. In the present study, school locations were used as a proxy for socio-economic status because individual data were not available. In the Australian public school system, however, young people attend local schools and as such, the location of the school provides a close representation of the general social standing of children and their families attending the school. Brisbane and Perth were specifically chosen because we wished to capture a representative sample of Australian high school students, and by selecting two cities we increased the generalizability of our findings to make judgments about the adolescent population. With Queensland being the third largest state by population and Western Australia being the fifth largest state by population, the capital cities of these two states provided us with a reasonable representation of social and contextual milieus of Australian cities and provided an east-west dichotomy.

Measures

Achievement goals

Achievement goals were assessed by the Achievement Goal Questionnaire (Elliot & McGregor, 2001). It is comprised 12 items, with three items composing each of the four achievement goal orientations. Items are rated on a scale ranging from 1 (*Not at all true of me*) to 7 (*Very true of me*). Within the present dataset, Cronbach's Alpha coefficient was .75 for the mastery-approach goal, .77 for the performance-approach goal, and .72 for the performance-

avoidance goal. The mastery-avoidance goal showed Cronbach's Alpha coefficient of .43 and thus was excluded from subsequent analyses. In addition, the wording of the items of the mastery-approach (e.g., *I want to learn as much as possible from any class*), performance-approach (e.g., *My goal in any class is to get a better grade than most of the other students*), and performance-avoidance "*My fear of performing poorly in any class is often what motivates m*e" subscales were slightly altered to make the goal measures more general (i.e., no reference to 'in this class')

Academic interest

Academic interest was assessed with an 8-item subscale (e.g., *I like being in school*) from the Multidimensional Students' Life Satisfaction Scale (MSLSS) of Huebner, Laughlin, Ash, and Gilman (1998). Participants were asked to indicate how they were feeling in school at the current moment or during the last few weeks using a scale ranging from 1 (*Not at all*) to 7 (*Totally agree*).Within the present dataset, the 8-item scale showed Cronbach's Alpha coefficient of .82.

Achievement motivations

Achievement motivation orientations were assessed using the Orientations of Achievement Motivation Scale (Yu &Yang, 1994). The scale comprised 18 items, with 9 items comprising each of the SOAM (e.g., *I try my best to meet my parents' expectations so as not to disappoint them*) and the IOAM (e.g., *I enjoy making progress toward the educational goals that I have set for myself*) subscales. Items are rated on a scale ranging from 1 (*Not at all true of me*) to 7 (*Very true of me*). Within the present dataset, Cronbach's Alpha coefficient was .81 for the IOAM and .79 for the SOAM.

Academic achievement

Achievement scores in three core courses undertaken by all students (English, mathematics, and science) were obtained from schools records at the end of the mid-term exams. These were the courses aggregated total score (i.e., the sum of on-courses assignments and class-based examinations score) and were summed to form an overall index of students' academic achievement.

Procedure

A three-wave prospective design was used in the present study. Participants completed a first questionnaire measuring their achievement motivation orientations at the beginning of the first semester. The questionnaire was administered by a trained experimenter according to standardized instructions. Students were told that additional information would be gathered later on and so it was important that they write their student identification code on the questionnaire. The experimenter also explained the types of questions that students would be asked to answer and provided examples. It was clearly stated that confidentiality of students' answers would prevail at all times. For all participants, the administration of the first questionnaire took place three weeks after the beginning of the semester. Six weeks after they had completed the first questionnaire (i.e., 9 weeks after the beginning of the semester), participants completed a second questionnaire measuring their achievement goal orientations. Finally, at the end of the semester (i.e., 15 weeks after the beginning of the semester), participants completed a questionnaire assessing their academic interest.

Data analysis strategy

A multiple mediation analysis tests simultaneous mediation by multiple variables (Lockwood & MacKinnon, 1998). In practice, testing a multiple mediation model involves (a)

examining the total indirect effect to decide whether the set of mediators transmits the effect of the independent variable(s) to the dependent variable(s) and (b) examining the specific indirect effect associated with each proposed mediator. Either or both types of effects may be of theoretical interest and worth investigating because it is possible to find specific indirect effects to be significant in the presence of a nonsignificant total indirect effect due to a suppression effect (see MacKinnon, Warsi, & Dwyer, 1995; Preacher & Hayes, 2008).

The model of the present study

The model of the present study posits that IOAM and SOAM lead to mastery, performance approach, and performance avoidance goals which in turn lead to academic achievement and interest (Figure 1). We tested (a) the total indirect effect of IOAM on academic achievement through all achievement goal orientations, (b) the total indirect effect of IOAM on academic interest through all achievement goal orientations, (c) the total indirect effect of SOAM on academic achievement through all achievement goal orientations, and (d) the total indirect effect of SOAM on academic interest through all achievement goal orientations.

We also tested the (a) the specific indirect effect of IOAM on academic achievement through each of the achievement goal orientations, (b) the specific indirect effect of IOAM on academic interest through each of the achievement goal orientations, (c) the specific indirect effect of SOAM on academic achievement through each of the achievement goal orientations, and (d) the specific indirect effect of SOAM on academic interest through each of the achievement goal orientations.

Bootstrapping procedure

We used the SPSS script that accompanies the paper by Preacher and Hayes (2008) on testing multiple mediation models (available for download from www.quantpsy.org) to run a bootstrapping procedure and estimate the indirect effects and to test their significance by using confidence intervals. Bootstrapping is a nonparametric resampling procedure that does not impose the assumption of normality of the sampling distribution (Bollen & Stine, 1990; Lockwood & MacKinnon, 1998; Shrout & Bolger, 2002).

The total indirect effect was defined as the sum of the indirect effects across all mediators in a given model, $\sum_i (a_i b_i)$, i = 1 to j mediators, whereas the specific indirect effect was defined as the indirect effect of a particular mediator ($a_i b_i$), or the product of the two regression coefficients. Calculation of the specific indirect effects involved four steps (see Preacher & Hayes, 2008): (a) From our original dataset of 503 cases, a bootstrap sample of 503 cases was generated using random sampling with replacement; (b) the regression coefficients and the indirect effect estimates were calculated based on this bootstrap sample; (c) by repeating this process 5,000 times, 5,000 estimates of the indirect effect of interest were obtained; and (d) the mean of the 5,000 indirect effect estimates was calculated. If a zero was not included in the 95% confidence interval of the estimate, we concluded that the indirect effect was statistically significant (Preacher & Hayes, 2008; Shrout & Bolger, 2002). These bootstrapped indirect estimates were used in the multiple mediation model. The investigation of a multiple mediation model also allowed us to test the significance of the specific indirect effects associated with each mediation model.

RESULTS

Descriptive statistics

Descriptive statistics and correlational analyses are reported in Table 1. Also, a paired-sample t-test showed that students scored significantly higher on IOAM than SOAM (M = 50.5, SD = 4.3 *vs.* M = 48.3, SD = 3.7), t (502) = 13.3, $p < .001$, d = .55. For Cohen's d, an effect size

of .2 to .3 represents a small effect, around .5 represents a medium effect, and .8 to infinity represents a large effect. The effect sizes indicate how many standard deviations apart the means were (Cohen, 1988).

Hierarchical multiple regression

In line with the hypothesized precedence of achievement motivations over achievement goals (Bernardo, 2008; Elliot & Church, 1997; Leung, 2003; Tao & Hong, 2000), a two-block hierarchical regression analysis was conducted in which academic interest scores were regressed on the two achievement motivation orientations in block 1 and the three achievement goal orientations were added in block 2. The analysis showed that achievement motivation orientations accounted for 14% (R^2 = .14) of the variance in academic interest, F (2, 500) = 11.5, p <.001. IOAM (β = .30, t = 5.7, p < .01) and SOAM (β = .27, t = 4.2, p < .01) significantly predicted academic interest. When the three achievement goal orientations were entered in block 2, the R^2 value for the analysis changed from .14 to .25. The change in the R^2 value (.11) was statistically significant, ΔF (3, 497) = 7.4, p < .001. In this regression model, a mastery-approach goal (β = .31, t = 4.4, p < .01) significantly predicted academic interest but not performance-approach (β = -.09, t = .77, *ns*) or performance-avoidance goals (β = .06, t = .43, *ns*).

In the second two-block hierarchical regression analysis, academic achievement scores were regressed on the two achievement motivation orientations in block 1 and the three achievement goal orientations were added in block 2. The analysis showed that achievement motivation orientations accounted for 17% (R^2 =.17) of the variance in academic achievement, F (2, 500) = 10.5, p <.001. IOAM (β = .33, t = 3.9, p < .01) and SOAM (β = .29, t = 3.4, p < .01) significantly predicted academic achievement. When the three achievement goal orientations were entered in block 2, the R^2 value for the analysis changed from .17 to .30. The change in the R^2 value (.13) was statistically significant, ΔF (3, 497) = 5.6, p < .01. In this regression model, performance-approach (β = .28, t = 3.5, p < .01) and performance-avoidance goals (β = - .26, t = 2.7, p < .01) significantly predicted academic achievement but not a mastery-approach goal (β = .06, t = 1.3, *ns*).

Table 1: Descriptive statistics and correlational analyses of all variables

Variables	**Person inter-correlations of all variables**						
	1	2	3	4	5	6	7
1. SOAM	-						
2. IOAM	.37**	-					
3. Mastery-approach	.29*	.33**	-				
4. Performance-approach	.32**	- .30**	.24*	-			
5. Performance-avoidance	.26*	- .27*	- .26*	.11	-		
6. Academic achievement	.32**	.34**	.20*	.33**	- .30**	-	
7. Academic interest	.27*	.30**	.31**	.06	.09	.33**	-
Mean	48.3	50.5	18.2	16.2	17	76.2	47.5
SD	3.7	4.3	2.7	2.4	2.1	3.8	4.6

Note. N = 503. *p < .05, **p < .01

Multiple mediation analysis

Direct and indirect effects of IOAM on academic interest

Academic interest was regressed on the three achievement goal orientations which were regressed simultaneously on IOAM. SOAM was set as a covariate. It was found that the total indirect effect of IOAM on academic interest through the three achievement goal orientations was not statistically significant because its confidence interval contained a zero (BCA 95% CI lower = - .007, BCA 95% CI upper = .202). However, Preacher and Hayes (2008) argued that specific indirect effects should still be examined even in the presence of a non-significant total indirect effect because suppression effects may obscure the impact of individual mediators (MacKinnon, Krull, & Lockwood, 2000). Thus, we also examined the specific indirect effect of each of the three mediators (i.e., achievement goal orientations) on the relationship between IOAM and academic interest.

There was a significant indirect effect of IOAM on academic interest through a mastery-approach goal (BCA 95% CI lower = .084, BCA 95% CI upper = .097) because its confidence interval does not contain zero. This means that a mastery-approach goal mediated the relationship between IOAM and academic interest. Figure 2 shows that the relationships between IOAM and a mastery-approach goal (β = .31) and between a mastery-approach goal and academic interest (β = .29) were positive. These findings indicate that stronger endorsement of IOAM was associated with stronger pursuing of a mastery-approach goal which was associated with greater academic interest.

However, the indirect effects of IOAM on academic interest through performance-approach (BCA 95% CI lower = - .004, BCA 95% CI upper = .018) and performance-avoidance goals (BCA 95% CI lower = - .009, BCA 95% CI upper = .015) were not significant because their confidence intervals contain zero. This means that performance-approach and performance-avoidance goals did not mediate the relationship between IOAM and academic interest.

Direct and indirect effects of SOAM on academic interest

Academic interest was regressed on the three achievement goal orientations which were regressed simultaneously on SOAM. IOAM was set as a covariate. It was found that the total indirect effect of SOAM on academic interest through the three achievement goal orientations was not statistically significant because its confidence interval contained a zero (BCA 95% CI lower = - .009, BCA 95% CI upper = .163).

An examination of the specific indirect effect of each of the three mediators (i.e., achievement goal orientations) on the relationship between SOAM and academic interest showed that there was a significant indirect effect of SOAM on academic interest through a mastery-approach goal (BCA 95% CI lower = .066, BCA 95% CI upper = .087) because its confidence interval does not contain zero. This means that a mastery-approach goal mediated the relationship between SOAM and academic interest. Figure 2 shows that the relationships between SOAM and a mastery-approach goal (β = .26) and between a mastery-approach goal and academic interest (β = .29) were positive. These findings indicate that stronger endorsement of SOAM was associated with stronger pursuing of a mastery-approach goal which was associated with greater academic interest.

However, the indirect effects of SOAM on academic interest through performance-approach (BCA 95% CI lower = - .008, BCA 95% CI upper = .057) and performance-avoidance goals (BCA 95% CI lower = - .026, BCA 95% CI upper = .007) were not significant because their confidence intervals contain zero. This means that performance-approach and performance-avoidance goals did not mediate the relationship between SOAM and academic interest.

Direct and indirect effects of IOAM on academic achievement

Academic achievement was regressed on the three achievement goal orientations which were regressed simultaneously on IOAM. SOAM was set as a covariate. It was found that the total indirect effect of IOAM on academic achievement through the three achievement goal orientations was not statistically significant because its confidence interval contained a zero (BCA 95% CI lower = - .009, BCA 95% CI upper =.098).

An examination of the specific indirect effect of each of the three mediators (i.e., achievement goal orientations) on the relationship between IOAM and academic achievement showed that all the indirect effects of IOAM on academic achievement through mastery-approach (BCA 95% CI lower = - .009, BCA 95% CI upper = .055), performance-approach (BCA 95% CI lower = - .007, BCA 95% CI upper = .040), and performance-avoidance goals (BCA 95% CI lower = - .005, BCA 95% CI upper = .037) were not statistically significant because their confidence intervals contain zero. This means that these three achievement goal orientations did not mediate the relationship between IOAM and academic achievement.

Direct and indirect effects of SOAM on academic achievement

Academic achievement was regressed on the three achievement goal orientations which were regressed simultaneously on SOAM. IOAM was set as a covariate. It was found that the total indirect effect of SOAM on academic achievement through achievement goal orientations was statistically significant (BCA 95% CI lower = .052, BCA 95% CI upper = .073) because its confidence interval does not contain zero.

An examination of the specific indirect effect of each of the three mediators (i.e., achievement goal orientations) on the relationship between SOAM and academic achievement showed that that the indirect effects of SOAM on academic achievement through performance-approach (BCA 95% CI lower = .005, BCA 95% CI upper = .017) and performance-avoidance goals (BCA 95% CI lower = - .085, BCA 95% CI upper = - .061) were significant because their confidence intervals did not contain zero.

This means that performance-approach and performance-avoidance goals mediated the relationship between SOAM and academic achievement. Figure 2 shows that the relationships between SOAM and a performance-approach goal (β = .31) and between a performance-approach goal and academic achievement (β = .33) were positive. Similarly, the relationship between SOAM and a performance-avoidance goal was positive (β = .25). However, the relationship between performance-avoidance goals and academic achievement (β = - .28) was negative. These findings indicate that stronger endorsement of SOAM was associated with stronger pursuing of performance-approach goals which were associated with greater academic achievement. In contrast, stronger endorsement of SOAM was associated with stronger pursuing of performance-avoidance goals which were associated with lower academic achievement. The indirect effect of SOAM on academic achievement through a mastery-approach goal was not significant because its confidence contained a zero (BCA 95% CI lower = - .007, BCA 95% CI upper = .045). This means that a mastery-approach goal did not mediate the relationship between SOAM and academic achievement.

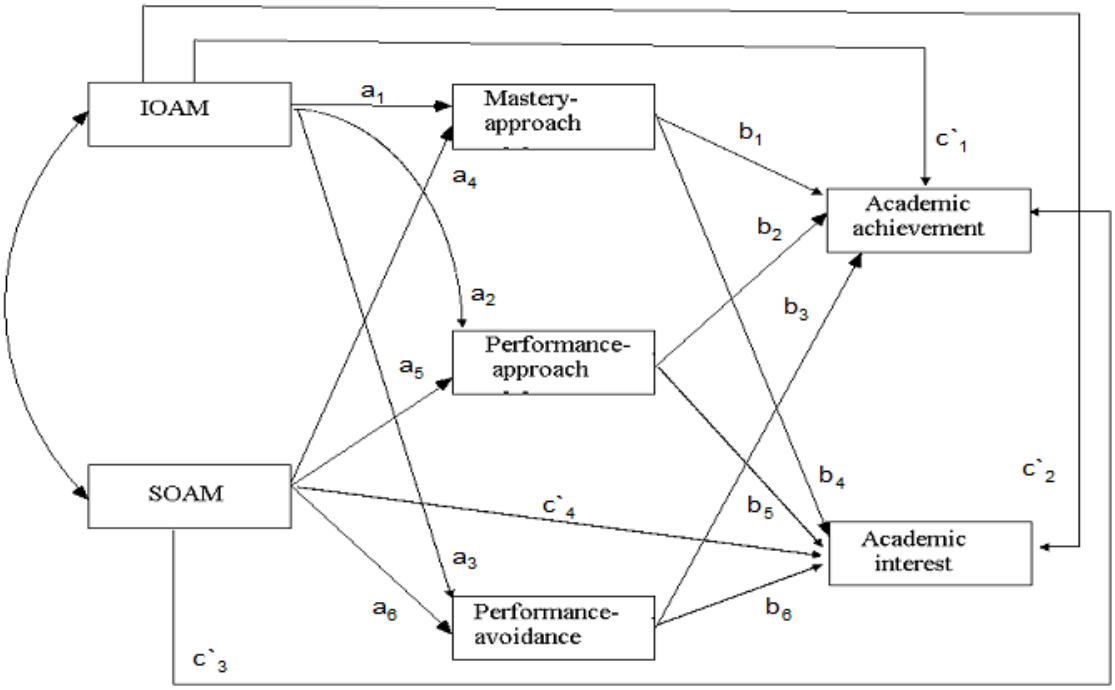

Figure 2. An estimated multiple mediation model of the relationship among achievement motivations and academic achievement and interest as mediated by achievement goals

Note. The numbers in the figure represent standardized regression coefficients with associated standard errors shown in brackets. c represent the total effect and is equal to the sum of direct and indirect effects (i.e., mediated effects) of the predictor variable on the outcome variable. c` represents the direct effect of the predictor variable on the outcome variable when taking the mediators into account

DISCUSSION

The present study examined the relationships among achievement motivations and academic achievement and interest and whether achievement goals mediate these relationships. The analysis showed that IOAM was found to correlate positively with SOAM. This means that the relationship between these two dimensions of achievement motivation is dynamic in nature and that these two dimensions do not necessarily contradict each other. As such, an individual may pursue several achievement motivations simultaneously and IOAM and SOAM endorsement may coexist within every individual.

In context, this finding show that Australian students work hard in academics and strive to achieve not only to satisfy their own personal goals and aspirations (i.e., IOAM), but also to meet the expectations and goals set by significant others such as family, teachers, and friends (SOAM) to gain social approval. This finding supports the argument that individualistic societies (e.g., Australia) need not prompt only IOAM. A student in an individualistic culture may be initially motivated simply by a desire to achieve his or her own goals and aspirations autonomously (IOAM), but eventually begin to internalize and adopt the significant others' goals and expectations (SOAM) to show his or her commitment to the group. Chang, Wong, and Teo (2000) proposed that individuals' striving to achieve may relate to a communal need for social recognition and a personal need for task mastery and that achievement may serve both needs. Consistent with finding, Tao and Hong (2000) reported a significant positive relationship between

Table 2: Indirect and total effects of IOAM and SOAM on academic achievement and interest through achievement goals

Mediators	Bootstrapping estimate	SD	BCA 95% CI Lower	BCA 95% CI Upper
Academic interest				
Specific and total indirect effects of IOAM				
Mastery-approach	.090	.002	.084	.097*
Performance-approach	.010	.001	- .004	.018
Performance-avoidance	.006	001	- .009	.015
Total indirect effects	.110	.003	- .007	.202
Specific and total indirect effects of SOAM				
Mastery-approach	.075	.021	.066	.087*
Performance-approach	.036	.032	- .008	.057
Performance-avoidance	- .015	.010	- .026	.007
Total indirect effects	.096	.053	- .009	.163
Academic achievement				
Specific and total indirect effects of IOAM				
Mastery-approach	.037	.008	- .009	.055
Performance-approach	.026	.010	- .007	.040
Performance-avoidance	.028	.007	- .005	.037
Total indirect effects	.091	.035	- .009	.098
Specific and total indirect effects of SOAM				
Mastery-approach	.031	.022	- .007	.045
Performance-approach	.100	.062	.005	.017*
Performance-avoidance	- .070	.002	- .085	- .061*
Total indirect effects	.060	.001	.052	.073*

Note. N = 503. BCA = bias corrected and accelerated. CI= confidence interval. *significant indirect effects ($p < .05$)

IOAM and SOAM in a sample of Hong Kong college students. In contrast, Leung (2003) reported a nonsignificant relationship between IOAM and SOAM in a sample of Chinese student teachers. Students scored significantly higher on the IOAM scale than the SOAM scale. This means that students placed more importance on IOAM than SOAM. Although IOAM and SOAM were found to coexist within Australian students, it is likely that personal feelings of independence and free personal choice were far more important for those students than social recognition and gaining social approval. From this perspective, SOAM may be subsidiary to IOAM within individualistic cultures and as such, the degree to which each achievement motivation orientation is adopted should be the focus of measurement within these contexts. Also, this finding is consistent with the notion that IOAM can be seen as the resultant orientation from socialization within individualistic societies (e.g., Australia) where people conceive the self as

independent and separated from others and see its values as deriving from its uniqueness (Iyengar & Lepper, 1999; Markus & Kitayama, 1991).

IOAM was found to correlate positively with a mastery-approach goal. This means that students who strongly endorsed IOAM were more likely to define competence intrapersonally (i.e., relative to oneself) with achievement goals, standards of excellence, and evaluation of performance or outcome defined and determined by students themselves. As such, the motivational dynamics of those students reflect strong self-instrumentality. Those students are also concerned with personal experience of learning new skills and knowledge (i.e., promotion-focus regulatory orientation, see Higgins, Shah, & Friedman, 1997) and mastery of challenging tasks (Tao & Hong, 2000). Consistent with this finding, Tao and Hong (2000, study 2) in a sample of Hong Kong college students and also Leung (2003) in a sample of Chinese student teachers reported a significant positive relationship between IOAM and a mastery-approach goal.

SOAM was found to correlate positively with performance-approach and performance-avoidance goals. This means that students who strongly endorse SOAM were more likely to define competence normatively (i.e., relative to others) with achievement goals, standards of excellence, and evaluation of performance or outcomes defined and determined by significant others such as the family, the group, or the society as a whole. As such, the motivational dynamics of those students reflect strong social instrumentality but weak functional autonomy. Those students are concerned with the demonstration of their knowledge and skills publicly in order to gain social approval and acceptance. They are also concerned with the avoidance of making mistakes (i.e., prevention-focus regulatory orientation, see Higgins et al., 1997) in order to fulfill obligations to significant others and show their commitment to the group. In line with this finding, several studies have shown that performance-approach and performance-avoidance goals are not in conceptual contrast with one another and that students can pursue both goals simultaneously (Church, Elliot & Gable, 2001; Elliot & McGregor, Gable, 1999). This finding replicates previous findings by Tao and Hong (2000, study 2) in a sample of Hong Kong college students and Leung (2003) in a sample of Chinese student teachers who reported a significant positive relationship between SOAM and performance-approach and performance-avoidance goals.

The mediation analysis showed that performance-approach and performance-avoidance goals mediated the relationship between SOAM and academic achievement. This finding supports the notion that different achievement motives and other psychological factors (see Elliot, 1999) may exert an indirect effect on achievement outcomes by evoking specific adoptions of achievement goals, which in turn serve as direct predictors of achievement outcomes (Elliot & Church, 1997). To the light of these findings, SOAM endorsement may be a mixed blessing. On the upside, SOAM endorsement related positively to performance-approach goals which in turn positively predicted academic achievement. On the downside, however, SOAM endorsement related positively to performance-avoidance goals which in turn negatively predicted academic achievement. This finding is consistent with the extant literature on the specialized goal pattern hypothesis that performance-approach goals are positively associated with academic achievement whereas performance-avoidance goals are negatively associated to academic achievement (Elliot & McGregor, 2001; Senko et al., 2008).

A mastery-approach goal mediated the relationship between IOAM and academic interest. This means that stronger endorsement of IOAM was associated with stronger adoption of a mastery-approach goal, perhaps reflecting a desire to strive to learn all there is to learn; which in turn was associated with higher academic interest. That is, stronger endorsement of IOAM can evoke desires that are channeled in a specific positive direction through stronger adoption of a mastery-approach goal which in turn promotes students' academic interest. This finding is consistent with the extant literature on the specialized goal pattern hypothesis that a mastery-

approach goal should relate to task interest and adaptive self-regulation (Elliot & Church, 1997; Elliot & McGregor, 2001; Harackiewicz et al., 2002).

Furthermore, a mastery-approach goal mediated the relationship between SOAM and academic interest. This means that stronger endorsement of SOAM was associated with stronger adoption of a mastery-approach goal which in turn was associated with higher academic interest. Of particular importance is the relationship between SOAM and a mastery-approach goal which is consistent with a recent line of theorizing that a mastery-approach goal though autonomously chosen is *sometimes* endorsed for social reasons. Specifically, a mastery-approach goal was found to correlate positively with social desirability concerns (e.g., garner teachers' appreciation), social goals to succeed at university (i.e., social utility goals), social goals to please teachers, parents, and significant others (i.e., social responsibility goals), social comparisons, and to fit in (i.e., belongingness goals) and cooperativeness (see Darnon et al., 2010; Horst et al., 2007; Régner et al. 2007). For example, Dompnier et al., (2009) reported that university students perceptions of both social desirability and social utility related to mastery goals moderated the relationship between the endorsement of mastery goals and final grades. This relationship was reduced by the increase of perceived social desirability of mastery goals, and strengthened by the increase of perceived social utility of these goals. Also, Régner et al. (2007) reported that both performance goals (approach and avoidance) and mastery goals predicted social comparison in a sample of university students and that the relationship between mastery goals and social comparison was observed even after controlling for performance goals effects. In line with this finding, Bernardo (2008), reported that personal performance standards motivations (i.e., IOAM) and parent-oriented motivations (i.e., SOAM) were positively associated with a mastery-approach goal in a sample of Filipino university students. Also, Verkuyten et al. (2001) reported a positive relationship between task-goal orientation (i.e., mastery goal) and both IOAM and family-oriented achievement motivation (FOAM; conceptually equal SOAM) in three studies with Turkish and Dutch adolescents. In contrast, Leung (2003), using a sample of Chinese student teachers, reported that SOAM correlated negatively with the learning goal, but at the same time, correlated positively with the performance-approach and performance-avoidance goals.

Finally, looking specifically at the role of the different achievement goals, two conclusions can be drawn from the mediation analysis. First, only mastery-approach goals are significantly linked to academic interest after controlling for the other types of goals. Second, only performance-approach and performance-avoidance goals are significantly correlated with academic achievement in the proposed model. This suggests that pursuing task-based competence to understand, master, and learn is not associated with better performance. In fact, mastery-oriented students may tend to deviate from the instructions when they are over interested by a task in particular (Senko & Miles, 2008). Inversely, pursuing normative-based competence is not associated with higher academic interest. These findings demonstrate a paradoxical effect of the achievement goals (i.e., Elliot & McGregor, 2001; Van Yperen, 2006).

To summarize, the current findings provide further insight into the dynamics through which achievement motivation orientations can affect students' academic achievement and interest. It could be argued that IOAM was associated with higher levels of academic interest because such motivational orientation encourages a consideration of mediating factors that facilitate academic interest (i.e., mastery-approach goals). In contrast, SOAM is characterized as a mixed blessing. On one hand, SOAM can be associated with higher levels of academic achievement by evoking the adoption of performance-approach goals. On the other hand, SOAM can be linked to lower levels of academic achievement by evoking the endorsement of performance-avoidance goals.

The results of this study have practical implications. For instance, promoting the use of approach goals in a mentorship or a counseling relation might help students maintain higher levels of academic achievement and interest. Specifically, helping students to stop setting

performance-avoidance goals and start setting mastery-approach and performance-approach goals could allow these students to keep acceptable levels of academic achievement and interest, and perhaps counter the debilitative effect of performance-avoidance goals.

REFERENCES

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

Australian Bureau of Statistics. (1998). Census of population and housing: information paper, socio-economic indexes for areas. Available from: http://www.dest.gov.au/sectors/higher_education/publications_resources/statistics/outcomes/#Indicator. Accessed 22.9.2011.

Bernardo, A. B. (2008). Individual and social dimensions of Filipino students' achievement goals. *International Journal of Psychology, 43*, 886-891.

Bollen, K. A., & Stine, R. (1990). Direct and indirect effects: Classical and bootstrap estimates of variability. *Sociological Methodology, 20*, 115-140.

Chang, W. C., Wong, W. K. (2008). Socially oriented achievement goals of Chinese university students in Singapore: Structure and relationships with achievement motives, goals and affective outcomes, *International Journal of Psychology, 43*, 880-885.

Chang, W. C., Wong, W. K., & Teo, G. (2000). The socially oriented and individually oriented achievement motivation of Singaporean Chinese students. *Journal of Psychology in Chinese Societies, 1*, 39-63.

Church, M. A., Elliot, A. J., & Gable, S. L. (2001). Perceptions of classroom environment, achievement goals, and achievement outcomes. *Journal of Educational Psychology, 93*, 43-54.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2 ed.). New York: Lawrence Erlbaum Associates.

Corno, L., Cronbach, L., Kupermintz, H., Lohman, D., Mandinach, E., Porteus, A., & Talbert, J. (2002). *Remaking the concept of aptitude: Extending the legacy of Richard E. Snow*. Mahwah, NJ: Lawrence Erlbaum Associates.

Crosnoe, R., Riegle-Crumb, C., & Muller C. (2007). Gender, self-perception, and academic problems in high school. *Social Problems, 54*,118-138.

Darnon, C., Dompnier, B., Delmas, F., Pulfrey, C., & Butera, F. (2009). Achievement goal promotion at university: Social desirability and social utility of mastery and performance goals. *Journal of Personality and Social Psychology*, 96, 119-134.

Darnon, C., Dompnier, B., Gilliéron, O., Butera, F. (2010). The interplay of mastery and performance goals in social comparison: A multiple-goal perspective. *Journal of Educational Psychology*, 102, 212-222.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Dompnier, B., Darnon, & Butera, F. (2009). Faking the desire to learn: A clarification of the link between mastery goals and academic achievement. *Psychological Science*, 20, 939-943

Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values, and goals. *Annual Review of Psychology*, 53, 109-132.

Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist, 34*, 149-169.

Elliot, A. J. (2005). A conceptual history of the achievement goal construct. In A. J. Elliot & C. Dweck (Eds.), *Handbook of competence and motivation* (pp. 52–72). New York, NY: Guilford Press.

Elliot, A. J., Chirkov, V. I., Kim, Y., & Sheldon, K. M. (2001). A cross-cultural analysis of avoidance (relative to approach) personal goals. *Psychological Science*, 12, 505-645.

Elliot, A. J., & Dweck, C. S. (2005). Competence and motivation: Competence as the core of achievement motivation. In A. J. Elliot & C. S. Dweck (Eds.), *Handbook of competence and motivation* (pp. 3-14). New York: Guilford Press.

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

Elliot, A. J., & Thrash, T. M. (2001). *Achievement goals and the hierarchical model of achievement motivation*. *Educational Psychology Review*, 13, 139-156.

Elliot, E. S., & Church, M. A. (1997). A hierarchal model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72*, 218-232.

Elliot, E. S., McGregor, H. A., & Gable, S. L. (1999). Achievement goals, study strategies, and exam performance: A mediational analysis. *Journal of Educational Psychology, 91*, 549-563.

Elliott, J. G, & Bempechat, J. (2002). The culture and contexts of achievement motivation. *New Directions for Child and Adolescent Development, 96*, 7-26.

Harackiewicz, J. M., Barron, K. E., Pintrich, P. R., Elliot, A. J., & Thrash, T. M. (2002). Revision of achievement goal theory: Necessary and illuminating. *Journal of Educational Psychology, 94*, 638-645.

Higgins, E. T., Shah, J., & Friedman, R. (1997). Emotional responses to goal attainment: Strength of regulatory focus as moderator. *Journal of Personality and Social Psychology, 72*, 515-525.

Horst, S. J., Finney, S. J., & Barron, K. E. (2007). Moving beyond academic achievement goal measures: A study of social achievement goals. *Contemporary Educational Psychology*, 32, 667 – 698.

Huebner, S. E., Laughlin, J. E., Ash, C., & Gilman, R. (1998). Further validation of the Multidimensional Students' Life Satisfaction Scale. *Journal of Psychoeducational Assessment, 18*, 118-134.

Iyengar, S. S., & Lepper, M. R. (1999). Rethinking the value of choice: A cultural perspective on intrinsic motivation. *Journal of Personality and Social Psychology, 76*, 349-366.

Leung, M. T. (2003). *Cultural values and motivational beliefs as antecedents to Hong Kong student teachers' achievement goals and learning strategies.* Doctoral Dissertation, Hong Kong: The Chinese University of Hong Kong.

Lockwood, C. M., & MacKinnon, D. P. (1998). *Bootstrapping the standard error of the mediated effect.* Paper presented at the Proceedings of the 23rd annual meeting of SAS Users Group International conference, Cary, North Carolina, USA.

MacKinnon, D. P., Krull, J. L., & Lockwood, C. M. (2000). Equivalence of the mediation, confounding, and suppression effect. *Prevention Science*, 1, 173-181.

MacKinnon, D. P., Warsi, G., & Dwyer, J. H. (1995). A simulation study of mediated effect measures. *Multivariate Behavioral Research, 30*, 41-62.

Markus, H. R., & Kitayama, S. (1991). Culture and the self: Implications for cognition, emotion, and motivation. *Psychological Review*, 98, 224-253.

Markus, H. R., & Kitayama, S. (1998). The cultural psychology of personality. Journal of Cross-Cultural Psychology, 29, 63-87.

Martin, A. J., Marsh, H. W., Williamson, A., & Debus, R. L. (2003). Self-handicapping, defensive pessimism, and goal orientation: A qualitative study of university students. *Journal of Educational Psychology*, 95, 617-628.

McInerney, D. M., Roche, L. A., McInerney, V., & Marsh, H. W. (1997). Cultural perspectives on school motivation: The relevance and application of goal theory. *American Educational*

Research Journal, 34, 207-236.

Midgley, C. (1993). Motivation and middle level schools. In P. Pintrich & M. L. Maehr (Eds.), *Advances in motivation and achievement*: *Vol. 8. Motivation in the adolescent years* (pp. 219-276). Greenwich, CT: JAI Press.

Midgley, C., Anderman, E., & Hicks, L. (1995). Differences between elementary and middle school teachers: A goal theory approach. *Journal of Early Adolescence*, 15, 90-113.

Moller, A. C., & Elliot, A. J (2006). The 2 x 2 achievement goal framework: An overview of empirical research. In A. Mittel (Ed.), *Focus on educational psychology* (pp. 307-326). New York: Nova Science.

Okun, M. A., Fairholme, C., Karoly, P., Ruehlman, L. S., & Newton, C. (2006). Academic goals, goal process cognition, and exam performance among college students. *Learning and Individual Differences*, 16, 255-265.

Pintrich, P. R. (2000). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology, 3*, 544-555.

Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879-891.

Regner, I., Escribe, C., & Dupeyrat, C. (2007). Evidence of social comparison in mastery goals in natural academic settings. *Journal of Educational Psychology, 99*, 575-583.

Renninger, K. A., & Hidi, S. (2002). Student interest and achievement: Developmental issues raised by a case study. In J. Wigfield, & J.S. Eccles (Eds.), *Development of achievement motivation* (pp. 175-196). San Diego: Academic Press.

Senko, C., Durik, A. M., & Harackiewicz, J. M. (2008). Historical perspectives and new directions in achievement goal theory. In J. Y. Shah & A. W. Gardner (Eds.), *Handbook of motivation science* (pp. 100-113). New York: Guilford Press.

Senko, C., & Miles, K. M. (2008). Pursuing their own learning agenda: How mastery-oriented students jeopardize their class performance. *Contemporary Educational Psychology, 33*, 561-583.

Shrout, P. E., & Bolger, N. (2002). Mediation in experimental and nonexperimental studies: New procedures and recommendations. *Psychological Methods, 7*, 422-445.

Tao, V., & Hong, Y. Y. (2000). A meaning system approach to Chinese students' achievement goals. *Journal of Psychology in Chinese societies, 1*, 13-38.

Urdan, T. (1997). Achievement goal theory: Past results, future directions. In M. L.Maehr & P. R. Pintrich (Eds.), *Advances in motivation and achievement* (Vol. 10, pp. 99-141). Greenwich, CT: JAI Press.

Urdan, T. C. (2004). Using multiple methods to assess students' perception of classroom goal structures. *European Psychologist*, 9, 222-231.

Urdan, T., & Giancarlo, C. (2001). A comparison of motivational and critical thinking orientations across ethnic groups. In D. M.McInerney & S. V.Etten (Eds.), *Research on sociocultural influences on motivation and learning* (Vol. 1**,** pp. 37–60). Greenwich, CT: Information Age Publishing.

Udan, T. C., Midgley, C., & Anderman, E. M. (1998). The role of classroom goal structures in students' use of self-handicapping strategies. *American Educational Research Journal*, 35, 101-122.

Van Yperen, N. W. (2003). Task interest and actual performance: The moderating effects of assigned and adopted purpose goals. *Journal of Personality and Social Psychology***,** 85, 1006–1015.

Van Yperen, N. W. (2006). A novel approach to assessing achievement goals in the context of the 2 X 2 framework: Identifying distinct profiles of individuals with different dominant

achievement goals. *Personality and Social Psychology Bulletin, 32*, 1432-1445.

Verkuyten, M., Thijs, J., & Canatan, K. (2001). Achievement motivation and academic performance among Turkish early and young adolescents in the Netherlands. *Genetic, Social, and General Psychology Monographs, 127*, 378-408.

Yang, K. S., & Yu, A. (1988). *Social- and individual-oriented achievement motives: Conceptualization and measurement*. Paper presented at the Symposium on Chinese Personality and Social Psychology for the XXIVth International Congress of Psychology, Sydney, Australia.

Yu, A. B., & Yang, K. S. (1994). The nature of achievement motivation in collectivist societies. In U. Kim, H. C. Triandis, C. Kagitcibasi, S. C. Choi & G. Yoon (Eds.), *Individualism and collectivism: Theory, methods, and applications* (pp. 239-250). London: Sage Publications.

Zimmerman, B. J., & Kitsantas, A. (1997). Developmental phases in self-regulation: Shifting from process to outcome goals. *Journal of Educational Psychology*, 89, 29-36.