

## A 2 × 2 Achievement Goal Framework

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A 2 × 2 achievement goal framework comprising mastery-approach, mastery-avoidance, performance-approach, and performance-avoidance goals was proposed and tested in 3 studies. Factor analytic results supported the independence of the 4 achievement goal constructs. The goals were examined with respect to several important antecedents (e.g., motive dispositions, implicit theories, socialization histories) and consequences (e.g., anticipatory test anxiety, exam performance, health center visits), with particular attention allocated to the new mastery-avoidance goal construct. The results revealed distinct empirical profiles for each of the achievement goals; the pattern for mastery-avoidance goals was, as anticipated, more negative than that for mastery-approach goals and more positive than that for performance-avoidance goals. Implications of the present work for future theoretical development in the achievement goal literature are discussed.

Over the past 2 decades, a majority of the theoretical and empirical work conducted in the achievement motivation literature has used an achievement goal perspective. Achievement goals are viewed as the purpose (Maehr, 1989) or cognitive–dynamic focus (Elliot, 1997) of competence-relevant behavior, and throughout most of the achievement goal tradition, the primary emphasis has been on two goal types: mastery goals and performance goals (Dweck, 1986; Nicholls, 1984). Mastery goals are focused on the development of competence through task mastery, whereas performance goals are focused on the demonstration of competence relative to others. Each goal is presumed to provide a distinct perceptual–cognitive framework in achievement settings, and the two goals have been shown to lead to a differential pattern of processes and outcomes (see Ames, 1992; Dweck, 1999; Urdan, 1997).

Recently, Elliot and his colleagues (Elliot & Church, 1997; Elliot & Harackiewicz, 1996) proposed that the original mastery–performance goal dichotomy be revised to include the distinction between approach and avoidance motivation. Specifically, they offered a trichotomous achievement goal framework in which the mastery goal construct remained the same but the performance goal construct was bifurcated to form performance-approach and performance-avoidance goals. Empirical research on this trichotomous framework has yielded strong support; factor analytic work has validated the independence of the three goal constructs (Elliot & Church, 1997; Middleton & Midgley, 1997; Skaalvik, 1997;

Vandewalle, 1997) and the goals have been linked to differential patterns of antecedents and consequences (see Elliot, 1999).

In the present research, we delineate a new achievement goal framework that represents a further revision of the mastery–performance dichotomy and an extension of the trichotomous framework. In the trichotomous framework, the approach–avoidance distinction is applied only to performance goals; mastery goals are left intact. The new framework that we propose fully incorporates the approach–avoidance distinction by additionally bifurcating mastery goals to create mastery-approach and mastery-avoidance goals (for related proposals, see Elliot, 1999; Pintrich, 2000a, 2000b). The present research is designed to investigate the conceptual and empirical utility of this new achievement goal framework, with a particular emphasis on mastery-avoidance goals.

### Two Fundamental Dimensions of Achievement Goals

Competence is at the conceptual core of the achievement goal construct. Competence and, therefore, achievement goals, may be differentiated on two fundamental dimensions—according to how it is defined and according to how it is valenced.

Competence is defined in terms of the referent or standard that is used in performance evaluation. Three different standards may be identified: absolute (the requirements of the task itself), intrapersonal (one's own past attainment or maximum potential attainment), and normative (the performance of others). That is, competence may be evaluated, and therefore defined, according to whether one has acquired understanding or mastered a task (an absolute standard), improved one's performance or fully developed one's knowledge or skills (an intrapersonal standard), or performed better than others (a normative standard). Absolute and intrapersonal competence share many conceptual and empirical similarities and often seem indistinguishable (e.g., learning new information represents both the mastering of a task and the development of one's knowledge). As such, in the present research we consider these standards jointly rather than individually. Infants and toddlers make exclusive use of basic absolute standards to evaluate their actions, but by age 7, all individuals possess the capacity to use absolute, intrapersonal, and normative standards to

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define competence (Butler, 1998; Elliot, McGregor, & Thrash, in press; Ruble & Frey, 1991). The distinction between absolute/intrapersonal and normative standards was implicitly acknowledged in the classic conceptualization of achievement motivation, in that need for achievement was construed as a multidimensional construct that included doing well relative to task requirements and relative to others (McClelland, Atkinson, Clark, & Lowell, 1953; Murray, 1938). This distinction was made explicit in the achievement goal tradition in the proffering of a mastery–performance dichotomy and in essence became a signature feature of this approach.

The other fundamental dimension of competence is valence. Competence is valenced in that it is either construed in terms of a positive, desirable possibility (i.e., success) or a negative, undesirable possibility (i.e., failure). Accumulating evidence indicates that persons process most, if not all, encountered stimuli in terms of valence and do so immediately and without intention or awareness (Bargh, 1997; Zajonc, 1998). Furthermore, this automatic, valence-based processing is presumed to instantaneously evoke approach and avoidance behavioral predispositions (Cacioppo, Priester, & Berntson, 1993; Forster, Higgins, & Idson, 1998). These approach and avoidance tendencies are present in infancy, appear to be grounded in the neuroanatomical structure of the brain, and likely represent part of the evolutionary heritage that humans share with organisms across the phylogenetic spectrum (Elliot & Covington, in press). In short, valence-based processing, and its accompanying approach and avoidance motivational orientations, is ubiquitous across situations, including those that are competence-relevant. The distinction between approach and avoidance forms of competence motivation was a central aspect of the classic conceptualization of achievement motivation (Atkinson, 1957; Murray, 1938). This distinction may be found in implicit form in an early articulation of the achievement goal approach (Dweck & Elliott, 1983), but was not explicitly acknowledged until the inception of the trichotomous framework.

Both dimensions—definition and valence—are integral to the competence construct and, therefore, must be viewed as necessary components of any and all competence-based forms of regulation, including achievement goals. That is, it is impossible to formulate an achievement goal that does not include, implicitly or explicitly, information regarding how competence is defined and valenced. Accordingly, it seems reasonable to propose a  $2 \times 2$  conceptualization of achievement goals that includes each combination of the definition and valence dimensions. Figure 1 presents a pictorial representation of this  $2 \times 2$  achievement goal framework.

The trichotomous achievement goal framework comprises three of the four “cells” of this  $2 \times 2$  framework—mastery-approach goals (in which competence is defined in absolute/intrapersonal terms and is positively valenced), performance-approach goals (in which competence is defined in normative terms and is positively valenced), and performance-avoidance goals (in which competence is defined in normative terms and is negatively valenced). Although mastery goals to date have been conceptualized as a unitary construct, here we label them *mastery-approach* goals, because in both the dichotomous and trichotomous frameworks, these goals have been implicitly construed as positively valenced. Thus, the remaining cell of the  $2 \times 2$  framework is that representing mastery-avoidance goals (in which competence is defined in absolute/intrapersonal terms and is negatively valenced). Our con-

		Definition	
		Absolute/ intrapersonal (mastery)	Normative (performance)
Valence	Positive (approaching success)	Mastery- approach goal	Performance- approach goal
	Negative (avoiding failure)	Mastery- avoidance goal	Performance- avoidance goal

Figure 1. The  $2 \times 2$  achievement goal framework. Definition and valence represent the two dimensions of competence. Absolute/intrapersonal and normative represent the two ways that competence can be defined; positive and negative represent the two ways that competence can be valenced.

tion is that mastery-avoidance goals are operative in many achievement settings and that it is important to begin attending to this construct in theoretical and empirical work on achievement motivation.

### Mastery-Avoidance Goals

It is likely that mastery-avoidance goals have been overlooked in the achievement goal literature because most assume that mastery goals represent an approach form of regulation. In fact, some theorists equate mastery goals with intrinsic motivation, and virtually all portray mastery goals as the ideal form of competence-based regulation. Given the prevailing portrait of the mastery goal construct, the concept of a mastery-avoidance goal may seem counterintuitive. As such, in the following we consider this new type of achievement goal in greater detail.

In the mastery-avoidance goal construct, competence is defined in terms of the absolute requirements of the task or one's own pattern of attainment, and incompetence is the focal point of regulatory attention. Several examples may be provided: striving to avoid misunderstanding or failing to learn course material, striving not to make an error in a business transaction, striving not to miss a free throw in a basketball game, striving to avoid leaving a crossword puzzle incomplete, striving not to forget what one has learned, and striving not to lose one's physical or intellectual capabilities. Prototypic exemplars include perfectionists who strive to avoid making any mistakes or doing anything wrong or incorrectly (Flett, Hewitt, Blankstein, & Gray, 1998; see also Pintrich, 2000b), and individuals in the latter part of their careers (athletes, businesspersons) or lives (elderly persons) who begin to focus on not performing worse than before, not stagnating, or not losing their skills, abilities, or memory. Again, each of these forms of regulation represents a mastery-avoidance goal, in that the evaluative referent is specific to the task itself or the person's own attainment trajectory, and the focus is on avoiding a negative possibility.

Conceptually, mastery-avoidance goals differ from mastery-approach goals in terms of the valence of competence, from

performance-avoidance goals in terms of the definition of competence, and from performance-approach goals in terms of both the definition and valence of competence. Empirical predictions regarding the antecedents and consequences of mastery-avoidance goals are difficult to generate for two reasons. First, the mastery component of the goal is likely to emerge from optimal antecedents and to facilitate positive consequences (like mastery-approach goals), but the avoidance component is likely to emerge from nonoptimal antecedents and to have negative consequences (like performance-avoidance goals). Second, it is impossible to know the relative strength of the two components when combined or the precise way in which each component functions in conjunction with the other. All things considered, we hypothesize that the nomological network for mastery-avoidance goals will be more negative than that for mastery-approach goals and more positive than that for performance-avoidance goals. In light of the aforementioned complexities regarding mastery-avoidance goals, we felt it best to refrain from making additional, precise predictions regarding the antecedents and consequences of these goals. Instead, we opted to test our general hypotheses in the present studies, with the aim of developing a specific empirical profile for mastery-avoidance goals on the basis of the data obtained.

### Overview of the Present Research

The present research comprises three studies designed to investigate the 2 × 2 achievement goal framework in general and the mastery-avoidance goal construct in particular. All three studies were conducted in the undergraduate classroom, as such settings are well-suited for examining both antecedents and consequences of achievement goal adoption. The studies were guided by several objectives. First, we sought to determine if mastery-avoidance goals, like the goals in the trichotomous framework, could be operationalized in a face-valid, reliable manner. Second, we sought to investigate whether the four goals in the 2 × 2 framework represent empirically distinct constructs and whether the 2 × 2 framework represents a better fit to the data than the trichotomous framework and other alternatives. Third, we sought to examine the means and intercorrelations among the achievement goals, particularly to determine how mastery-avoidance goals relate to the other three goal constructs. Fourth, we sought to establish several antecedents of each goal in the 2 × 2 framework. Fifth, we sought to test the four achievement goals as simultaneous predictors of several process and outcome variables. These antecedent and consequence (i.e., process and outcome) variables were carefully selected to cover central variables in the achievement motivation literature that have been linked to achievement goals in prior research (e.g., need for achievement and fear of failure in Study 2) and theoretically interesting and important variables that have received little or no attention in achievement goal research to date (e.g., parental socialization and health center visits in Study 3). The specific aims of and predictions for the studies will be offered immediately prior to the presentation of each study.

### Study 1

Study 1 used a newly devised achievement goal questionnaire to assess each of the four goals in the 2 × 2 framework. One aim of the study was to determine if indeed a brief, internally consistent

measure of mastery-avoidance goals could be devised for use in the classroom context. Of particular interest was whether the four goals in the 2 × 2 framework could be validated as statistically independent using factor analytic techniques. We predicted that exploratory factor analysis (EFA) of the new achievement goal items would yield four distinct factors corresponding to the four goals of the 2 × 2 formulation and that these results would be obtained whether the factors were rotated orthogonally or obliquely. We also sought to examine the means for and intercorrelations among the achievement goal variables, with specific interest in mastery-avoidance goals in relation to the other three achievement goals. We offered no a priori predictions regarding the relative level of means but did anticipate that mastery-avoidance goals would be positively related to both mastery-approach and performance-avoidance goals (given that, conceptually, these goals share the definition and valence dimensions, respectively) and would be unrelated to performance-approach goals (given the absence of overlap on either dimension).

### Method

#### *Participants, Achievement Context, and Procedure*

A total of 180 (49 male and 131 female) undergraduates in an introductory-level psychology class participated in the study for extra credit. The class was conducted in lecture format, and evaluation was based on an absolute grading structure (e.g., at or above 90% of the total possible points is an A). Four weeks into the course, participants received the achievement goal questionnaire in an envelope and were asked to complete it and return it in the envelope within the next week. In each study of the present research, participants were assured that their responses would remain confidential and would not influence their course grade.

#### *The Achievement Goal Questionnaire*

A series of pilot studies was conducted prior to the research reported herein. The aim of the pilot work was to select or devise items to form brief, but reliable and valid indexes of each of the four achievement goals in the 2 × 2 framework. Items were systematically selected from our existing measures (Elliot, 1999; Elliot & Church, 1997) for mastery-approach, performance-approach, and performance-avoidance goals; new items were devised for mastery-avoidance goals. At the completion of the pilot work, three items were chosen to represent each achievement goal for Study 1, and these items are presented in Table 1. Participants indicated the extent to which they thought each item was true of them on a 1 (*not at all true of me*) to 7 (*very true of me*) scale.

### Results and Discussion

#### *EFAs and Reliabilities*

An EFA was conducted on the 12 achievement goal items using principal-components extraction with varimax rotation. The analysis yielded four factors with an eigenvalue exceeding unity, and the factor solution accounted for 81.5% of the total variance. Table 1 displays the loadings for each factor. Factor 1 accounted for 36.4% of the variance and comprised the 3 performance-approach items (eigenvalue = 4.37). The second factor accounted for 21.3% of the variance and consisted of the 3 mastery-avoidance items (eigenvalue = 2.56). Factor 3 accounted for 14.9% of the variance and consisted of the 3 mastery-approach items (eigenvalue = 1.79). The fourth factor accounted for 8.8% of the

Table 1  
*Study 1: Factor Loadings for Achievement Goals*

Achievement goal item	Factor			
	Performance approach	Mastery avoidance	Mastery approach	Performance avoidance
1. It is important for me to do better than other students.	.93 (.97)			
2. It is important for me to do well compared to others in this class.	.89 (.90)			
3. My goal in this class is to get a better grade than most of the other students.	.89 (.91)			
4. I worry that I may not learn all that I possibly could in this class.		.90 (.93)		
5. Sometimes I'm afraid that I may not understand the content of this class as thoroughly as I'd like.		.86 (.88)		
6. I am often concerned that I may not learn all that there is to learn in this class.		.84 (.85)		
7. I want to learn as much as possible from this class.			.91 (.93)	
8. It is important for me to understand the content of this course as thoroughly as possible.			.90 (.93)	
9. I desire to completely master the material presented in this class.			.80 (.78)	
10. I just want to avoid doing poorly in this class.				.87 (.90)
11. My goal in this class is to avoid performing poorly.				.85 (.88)
12. My fear of performing poorly in this class is often what motivates me.				.74 (.70)

Note.  $N = 180$ . All factor loadings  $> .35$  are presented in the table. Factor loadings were obtained using principal components extraction with orthogonal and oblique (in parentheses) rotation.

variance and comprised the 3 performance-avoidance items (eigenvalue = 1.06). All items loaded above .70 on their primary factor; none of the secondary loadings exceeded .35. When the analysis was repeated using oblique rotation, the results were the same (see Table 1). Participants' responses on the items for each factor were averaged to form the four goal indexes, and each index evidenced good reliability (see Table 2). Thus, clearly the four measures represent empirically separable and internally consistent achievement goal constructs.

#### *Means for and Intercorrelations Among the Achievement Goal Measures*

The descriptive statistics and intercorrelations among the achievement goal measures are presented in Table 2. The mean for mastery-avoidance goals was close to the scale midpoint but was also lower than the means for each of the other achievement goals. Thus, mastery-avoidance regulation was clearly operative in this setting but appears to have been less prevalent than the other three forms of goal regulation. The correlations among the measures indicate, as expected, that mastery-avoidance goals were positively associated with both mastery-approach ( $r = .35, p < .001$ ) and performance-avoidance ( $r = .36, p < .001$ ) goals; surprisingly,

mastery-avoidance goals were also positively associated with performance-approach goals ( $r = .27, p < .01$ ).

#### Study 2

In Study 2, our aim was to replicate the Study 1 findings and to additionally investigate important antecedents and consequences of adopting the goals in the  $2 \times 2$  framework. As in Study 1, we sought to validate the independence of the four achievement goals, only in this study we used confirmatory factor analysis (CFA) procedures; CFA was also used to examine the fit of alternative models and to compare the fit of the hypothesized model to these alternatives. Also as in Study 1, we were interested in examining the means and intercorrelations among the achievement goal variables. In the following, we provide an overview of our antecedent and consequence predictions. To reiterate, we refrained from generating specific a priori predictions for mastery-avoidance goals, given their hybrid conceptual nature and the absence of an extant empirical base.

We focused on two important categories of antecedent variables in this study: motivational dispositions (need for achievement, fear of failure, and self-determination) and class perceptions (perceived class engagement). In prior work (Elliot & Church, 1997), we

Table 2  
*Study 1: Descriptive Statistics, Reliabilities, and Intercorrelations Among Variables*

Variable	<i>M</i>	<i>SD</i>	Observed range	Possible range	Cronbach's $\alpha$	Variable				
						1	2	3	4	5
1. Mastery-approach goals	5.52	1.18	1-7	1-7	.87	—				
2. Mastery-avoidance goals	3.89	1.53	1-7	1-7	.89	.35**	—			
3. Performance-approach goals	4.82	1.68	1-7	1-7	.92	.21**	.27**	—		
4. Performance-avoidance goals	4.49	1.67	1-7	1-7	.83	-.05	.36**	.40**	—	
5. Gender						.21**	.05	.08	.00	—

\*\*  $p < .01$ .

demonstrated the importance of need for achievement and fear of failure as predictors of achievement goals by linking mastery-approach goals to need for achievement, performance-avoidance goals to fear of failure, and performance-approach goals to both of these motive dispositions. We expected to replicate these findings in the present study, using our newly devised achievement goal measures and a measure of need for achievement that differentiates absolute/intrapersonal competence (workmastery) from normative competence (competitiveness; see Spence & Helmreich, 1983). We predicted that mastery-approach goals would emerge from workmastery and performance-approach goals would emerge from competitiveness, given the correspondence in how competence is defined within these pairings (see also Vandewalle, 1997). Self-determination represents an inherently appetitive desire for autonomy and choice (Deci & Ryan, 1991) and has yet to be linked to achievement goal adoption. Self-determination is likely to be a positive predictor of mastery-approach goals, as these goals are commonly viewed as an intrinsic, autonomous type of competence-based regulation. Given its purely appetitive nature, self-determination is likely to be a negative predictor of performance-avoidance goals and unrelated to performance-approach goals (which represent a hierarchical combination of appetitive and aversive motivation; Elliot, 1997).

Perceptions of the achievement context complement motivational dispositions as important predictors of achievement goals (Maehr & Midgley, 1991). One such variable that has received significant attention in classroom settings is the extent to which the class is perceived as engaging or interesting (see Ames, 1992; Church, Elliot, & Gable, in press). A class that is perceived as engaging is likely to facilitate absorption and draw the student into the learning process. As such, perceived class engagement should positively predict mastery-approach goals; it is expected to be unrelated to performance-approach and performance-avoidance goal adoption.

To investigate the predictive utility of the four achievement goals, we focused on three important categories of achievement-relevant processes; study strategies, anticipatory test anxiety (TA), and subsequent goal regulation. In prior work (Elliot, McGregor, & Gable, 1999), we demonstrated that achievement goals are systematically linked to study strategies: Mastery-approach goals are positive predictors of deep processing, performance-approach goals are positive predictors of surface processing, and performance-avoidance goals are negative predictors of deep processing and positive predictors of surface processing and disorganized studying. We expected to replicate these findings in the present research, using our new goal measures and additionally controlling for mastery-avoidance goals.

We examined anticipatory TA using three variables: state TA, worry, and emotionality. Our predictions were based in the literature on the independence of positive and negative affective and motivational processes (see Gable, Reis, & Elliot, 2000). State TA, worry, and emotionality are negative affects, and we predicted that the negatively valenced goal (performance-avoidance) would be positively related to each negative affect, whereas the purely appetitive, positively valenced goal (mastery-approach) would be unrelated. Given their combination of appetitive and aversive motivation, performance-approach goals were expected to be unrelated to the TA variables or, perhaps, weakly positively related.

Goal stability and transfer are overlooked issues in the achievement goal literature and research on self-regulation more generally (Cropanzano, Citera, & Howes, 1995). Theorists have acknowledged the importance of examining stability and change in achievement goal regulation (Dweck, 1986, 1999; Elliot, 1997), but little research has been conducted in this area. Given their grounding in stable motivational dispositions, we anticipated that each achievement goal would evidence stability across achievement tasks (i.e., course exams). We generated no a priori hypotheses regarding the change from one type of achievement goal to another over time.

In this study and the next, all antecedent and consequence predictions were tested while controlling for participants' Scholastic Aptitude Test (SAT) scores. This statistical control is important, because it reduces the likelihood that any observed results are simply due to participants' general level of ability.

## Method

### *Participants, Achievement Context, and Procedure*

A total of 148 (62 male and 86 female) undergraduates in an introductory-level psychology class participated in the study for extra credit. The class was conducted in lecture format, and evaluation was based on a normative grading structure. In group sessions at the beginning of the semester, participants completed measures of need for achievement, fear of failure, self-determination, and perceived class engagement, and reported their SAT scores. Two weeks before their first exam, participants attended a group session to complete the achievement goal questionnaire. One week before the exam, participants were provided with the study strategy and TA measures and were instructed to complete them when they had finished their exam preparations. Participants returned the completed measures on the day of the exam. Approximately 10 days prior to both their second and third (of three) exams in the course and approximately 1 month and 2 months, respectively, after the first goal assessment, participants attended group sessions to again complete the achievement goal questionnaire.

### *Measures (See Table 3 for Reliability Information)*

*Motive dispositions.* Multidimensional need for achievement was assessed with Spence and Helmreich's (1983) Work and Family Orientation (WOFO) Scale. The WOFO yields an overall score and two subscales, Workmastery (14 items, e.g., "There is satisfaction in a job well done") and Competitiveness (5 items, e.g., "I feel that winning is important in work and games"), each of which has good reliability and validity (see Spence & Helmreich, 1983). Participants responded to each item on a 1 (*strongly disagree*) to 5 (*strongly agree*) scale. The subscale items were summed to form workmastery and competitiveness indexes, which were summed to create the overall need for achievement index. Fear of failure was assessed with the short form (6 items) of the Motive to Avoid Failure scale (Hagtvet & Benson, 1997; e.g., "I am afraid of failing in situations where the outcome is uncertain"). The reliability and validity of this measure has been demonstrated by Hagtvet and Benson (1997). Participants responded to each item on a 1 (*not at all true of me*) to 4 (*very true of me*) scale, and their responses were summed to form the fear of failure index.

*Self-determination.* Sheldon and Deci's (1996) 10-item Self-Determination Scale was used to assess trait self-determination. For each item, participants indicate which of two statements feels most true for them (e.g., "A. I sometimes feel that it's not really me choosing the things I do" or "B. I always feel like I choose the things I do") using a 1 (*only A feels true*) to 9 (*only B feels true*) scale. The measure has been shown to have good reliability and validity (Sheldon, Ryan, & Reis, 1996). Participants' responses were summed to form the self-determination index.

Table 3  
 Study 2: Descriptive Statistics and Reliabilities

Variable	<i>M</i>	<i>SD</i>	Observed range	Possible range	Cronbach's alpha
Overall need for achievement	69.11	8.66	47-87	19-95	.80
Workmastery	51.84	6.31	33-65	14-70	.78
Competitiveness	17.27	4.49	6-25	5-25	.81
Fear of failure	13.89	3.81	6-24	6-24	.85
Self-determination	62.81	12.87	28-89	9-90	.80
Perceived class engagement	23.85	4.09	11-28	7-28	.90
Mastery-approach goals	5.64	1.10	2-7	1-7	.89
Mastery-avoidance goals	3.99	1.41	1-7	1-7	.88
Performance-approach goals	4.55	1.65	1-7	1-7	.94
Performance-avoidance goals	4.48	1.57	1-7	1-7	.83
Deep processing	20.83	5.43	6-26	5-35	.76
Surface processing	23.43	5.42	7-28	5-35	.72
Disorganization	17.53	7.37	5-30	5-35	.89
State TA	83.94	22.74	40-140	20-140	.95
Worry	14.32	4.80	5-25	5-25	.87
Emotionality	11.66	5.14	5-25	5-25	.90
Subsequent mastery-approach goals	5.25	1.07	1.83-7	1-7	.90
Subsequent mastery-avoidance goals	4.10	1.31	1-7	1-7	.90
Subsequent performance-approach goals	4.45	1.71	1-7	1-7	.97
Subsequent performance-avoidance goals	4.69	1.41	1.17-7	1-7	.85
SAT scores	1270.99	137.63	890-1600	0-1600	

Note. TA = test anxiety; SAT = Scholastic Aptitude Test.

*Perceived class engagement.* Elliot and Church's (1997) four-item measure was used to assess participants' perceived class engagement (e.g., "I think this class will be very interesting"). The reliability of this measure has been documented by Elliot and Church (1997). Participants responded to each item on a 1 (*not at all true of me*) to 7 (*very true of me*) scale, and their responses were summed to form the perceived class engagement scale.

*SAT scores.* Participants' verbal and math scores were summed to form an SAT score index.

*Achievement goals.* The achievement goal questionnaire from Study 1 was used to assess participants' achievement goals for their first exam.

*Study strategies.* Elliot et al.'s (1999) study strategy questionnaire was used to assess participants' reports of deep processing (e.g., "I treat the course material as a starting point and try to develop my own ideas about it"), surface processing (e.g., "When I study for the exam, I try to memorize as many facts as I can"), and disorganization (e.g., "I find it difficult to organize my study time effectively") during exam preparation. Each strategy is assessed with five items; the three measures have been shown to have good reliability and validity (Elliot et al., 1999). Participants indicated their response to each item on a 1 (*not at all true of me*) to 7 (*very true of me*) scale, and the items within each measure were summed to form the three study strategy indexes.

*Anticipatory TA.* Three measures of anticipatory TA were used. The state form of Spielberger, Gorsuch, and Lushene's (1970) 20-item revised State-Trait Anxiety Inventory was used to assess state TA (e.g., "I feel anxious"). Much research supports the reliability and validity of this measure (Spielberger et al., 1970). Participants' responses on the 1 (*strongly disagree*) to 7 (*strongly agree*) scales were summed to form the state TA index. Worry and emotionality were assessed with Morris, Davis, and Hutchings' (1981) 10-item Revised Worry-Emotionality Scale. Research attests to the reliability and validity of the 5-item worry (e.g., "I feel that I may not do as well on this exam as I could") and emotionality (e.g., "I am nervous") measures (Morris et al., 1981). Participants' responses on the 1 (*does not describe my condition*) to 5 (*describes my condition very well*) scales were summed to form the worry and emotionality indexes.

*Subsequent achievement goals.* The same achievement goal questionnaire used to assess participants' goals for their first exam was used to

assess participants' subsequent goals for the remaining exams. Participants responses were averaged across assessments to create the following measures: subsequent mastery-approach goals, subsequent mastery-avoidance goals, subsequent performance-approach goals, and subsequent performance-avoidance goals.<sup>1</sup>

## Results and Discussion

### CFAs and Reliabilities

CFAs were conducted on the achievement goal items using AMOS 4 (Arbuckle, 1994). The analyses were conducted on covariance matrices, and the solutions were generated on the basis of maximum-likelihood estimation. Following Hoyle and Panter (1995), both absolute (e.g., chi square) and incremental (e.g., Comparative Fit Index [CFI]) fit indices were used to evaluate the fit of the models to the data. The first CFA examined the hypothesized model, which designated that the items for each goal load on their respective latent variables. The results from this analysis strongly supported the hypothesized model, as each fit statistic met the conventional criteria for a good fitting model:  $\chi^2(48, N = 148) = 60.49, p = .11$ ; root-mean-square error of approximation (RMSEA) = .042; Tucker-Lewis Index (TLI) = .99; CFI = .99. Figure 2 presents the factor loadings for this model.

Additional CFAs examined the fit of alternative models and compared the fit of the hypothesized and alternative models. Four alternative models were tested: (a) trichotomous model A, in which the performance-approach and performance-avoidance items load on their respective latent variables, and the mastery-approach and mastery-avoidance items load together on a third

<sup>1</sup> Individual items for the subsequent goal measures were also used in pilot testing for the present research; however, the aggregate measures used in this study were not used for this purpose.

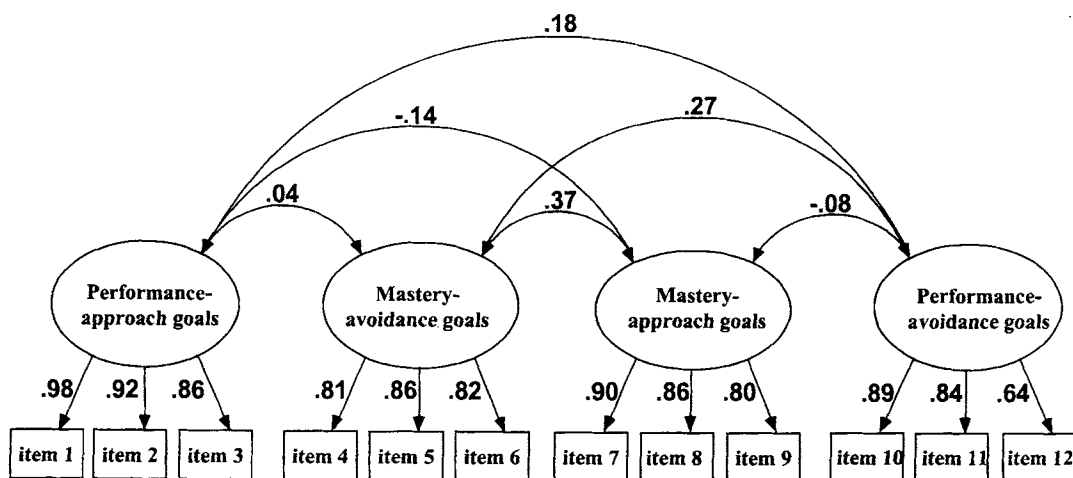


Figure 2. Confirmatory factor analysis of the achievement goal items. The values in the figure are standardized coefficients.

latent variable; (b) Trichotomous Model B, in which the mastery-approach and performance-approach items load on their respective latent variables, and the mastery-avoidance and performance-avoidance items load together on a third latent variable; (c) a mastery-performance model in which the mastery-approach and mastery-avoidance items load together on one latent variable, and the performance-approach and performance-avoidance items load together on another; and (d) an approach-avoidance model in which the mastery-approach and performance-approach items load together on one latent variable, and the mastery-avoidance and performance-avoidance items load together on another. As displayed in Table 4, the results from these analyses indicated that none of the alternative models provided a good fit to the data, and the hypothesized model provided a far better fit than any of the alternative models.<sup>2</sup>

Participants' responses on the items for each hypothesized factor were averaged to form the four goal indexes. Each resultant index evidenced good reliability as indicated by Cronbach's alpha (see Table 3). In sum, the CFA and reliability data clearly indicate that the four achievement goal measures represent empirically separable and internally consistent variables.

#### Means for and Intercorrelations Among the Achievement Goal Measures

The descriptive statistics and intercorrelations among the achievement goal (and all other) measures are presented in Tables 3 and 5. As in Study 1, the mean for mastery-avoidance goals was close to the scale midpoint but lower than the means for each of the other goals. The zero-order correlations among the measures indicate, as expected, that mastery-avoidance goals were positively associated with both mastery-approach ( $r = .32, p < .001$ ) and performance-avoidance ( $r = .28, p < .001$ ) goals; they were not associated with performance-approach goals ( $r = .05$ ).

#### Regression Analyses: Predictors of Achievement Goals

Simultaneous regression analyses were conducted to examine the influence of the antecedent variables on each achievement

goal, controlling for SAT scores. Two regression models were used in the motive disposition analyses: (a) overall need for achievement, fear of failure, and SAT scores, and (b) workmastery, competitiveness, fear of failure, and SAT scores. The regression models for self-determination and perceived class engagement simply consisted of the self-determination or perceived class engagement variable and SAT scores. Preliminary analyses included gender, which was retained in the final models when significant (Judd & Kenny, 1981).

**Mastery-approach goals.** The first motive disposition analysis revealed that overall need for achievement was a positive predictor of mastery-approach goals,  $F(1, 132) = 4.15, p < .05$  ( $\beta = .17$ ). The analysis with the second model revealed that workmastery was a positive predictor of mastery-approach goals,  $F(1, 131) = 9.95, p < .005$  ( $\beta = .30$ ). In the self-determination analysis, self-determination was a positive predictor of mastery-approach goals,  $F(1, 133) = 7.28, p < .01$  ( $\beta = .23$ ). Gender was a positive predictor in each of these analyses ( $\beta$ s = .22, .19, and .21,  $p$ s < .05, respectively), indicating that women were more likely to adopt mastery-approach goals than men. In the perceived classroom engagement analysis, perceived classroom engagement was a positive predictor of mastery-approach goals,  $F(1, 133) = 29.77, p < .001$  ( $\beta = .43$ ).

**Mastery-avoidance goals.** Both motive disposition analyses revealed that fear of failure was a positive predictor of mastery-avoidance goals,  $F(1, 133) = 10.49, p < .005$  ( $\beta = .28$ ), and  $F(1, 132) = 6.99, p < .01$  ( $\beta = .25$ ), respectively. In the self-determination analysis, self-determination was a negative predictor of mastery-avoidance goals,  $F(1, 134) = 4.97, p < .05$  ( $\beta =$

<sup>2</sup> The other possible trichotomous model (in which the mastery-approach and mastery-avoidance items load on their respective latent variables and the performance-approach and performance-avoidance items load together on a third latent variable) is less central to the issues at hand but was nevertheless tested as well. The model did not provide a good fit to the data,  $\chi^2(48, N = 148) = 220.39, p < .001$  (RMSEA = .15; TLI = .79; CFI = .85), and did not fit as well as the hypothesized model,  $\Delta\chi^2(1) = 159.89, p < .001$ .

Table 4  
 Study 2: Results From Confirmatory Factor Analyses

Variable	$\chi^2$ ( $N = 148$ )/ $\Delta\chi^2$	RMSEA	TLI	CFI
Model fit				
Hypothesized model	$\chi^2(48) = 60.49, p = .11$	.04	.99	.99
Trichotomous Model A	$\chi^2(49) = 210.93, p < .001$	.15	.80	.86
Trichotomous Model B	$\chi^2(49) = 248.28, p < .001$	.17	.76	.82
Mastery–performance model	$\chi^2(50) = 402.54, p < .001$	.22	.58	.68
Approach–avoidance model	$\chi^2(50) = 457.75, p < .001$	.24	.51	.63
Model comparison				
Hypothesized model vs. trichotomous Model A	$\Delta\chi^2(1) = 150.43, p < .001$			
Hypothesized model vs. trichotomous Model B	$\Delta\chi^2(1) = 187.78, p < .001$			
Hypothesized model vs. mastery–performance model	$\Delta\chi^2(1) = 342.05, p < .001$			
Hypothesized model vs. approach–avoidance model	$\Delta\chi^2(1) = 397.26, p < .001$			

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

–.19). In the perceived classroom engagement analysis, perceived classroom engagement was a positive predictor of mastery-avoidance goals,  $F(1, 133) = 5.24, p < .05$  ( $\beta = .19$ ).

**Performance-approach goals.** The first motive disposition analysis revealed that both overall need for achievement,  $F(1, 133) = 29.87, p < .001$  ( $\beta = .42$ ), and fear of failure,  $F(1, 133) = 19.11, p < .001$  ( $\beta = .33$ ), were positive predictors of performance-approach goals. The analysis with the second model revealed positive relationships for both competitiveness,  $F(1, 132) = 63.78, p < .001$  ( $\beta = .57$ ), and fear of failure,  $F(1, 132) = 4.90, p < .05$  ( $\beta = .17$ ). The self-determination and perceived classroom engagement analyses did not yield significant relationships for either variable. SAT scores were a positive predictor of performance-approach goals in each of these analyses ( $\beta$ s = .30, .24, .23, and .23,  $ps < .001$ , respectively).

**Performance-avoidance goals.** Both motive disposition analyses revealed that fear of failure was a positive predictor of performance-avoidance goals,  $F(1, 133) = 11.89, p < .001$  ( $\beta = .29$ ), and  $F(1, 132) = 7.43, p < .01$  ( $\beta = .25$ ), respectively. In the self-determination analysis, self-determination was a negative predictor of performance-avoidance goals,  $F(1, 134) = 5.73, p < .05$  ( $\beta = -.20$ ), as were SAT scores ( $\beta = -.19, p < .05$ ). No significant relationships were revealed in the perceived classroom engagement analyses.

#### Regression Analyses: Achievement Goals as Predictor Variables

Simultaneous regression analyses were conducted to examine the influence of the achievement goals on the study strategy, TA, and subsequent achievement goal variables, controlling for SAT scores. The basic regression model used in all of the analyses contained the four achievement goals (thereby affording a test of each goal's unique predictive utility) and SAT scores. All two-way achievement goal interactions (created from centered main effects) were included in preliminary analyses, and significant interactions

were retained in the final models.<sup>3</sup> Preliminary analyses also included gender, which was retained in the final model when significant.

**Study strategies.** Regressing deep processing on the basic model revealed that mastery-approach goals were a positive predictor of deep processing,  $F(1, 129) = 8.52, p < .005$  ( $\beta = .26$ ), whereas performance-avoidance goals were a marginally significant negative predictor,  $F(1, 129) = 2.91, p < .09$  ( $\beta = -.16$ ). No other variables were significant (mastery-avoidance goals  $\beta = -.01$ ).

Regressing surface processing on the basic model revealed that performance-avoidance goals were a positive predictor of surface processing,  $F(1, 129) = 12.08, p < .001$  ( $\beta = .31$ ), and performance-approach goals were a marginally significant positive predictor,  $F(1, 129) = 3.15, p = .078$  ( $\beta = .15$ ). No other variables attained significance (mastery-avoidance goals  $\beta = .07$ ).

Regressing disorganization on the basic model revealed that mastery-avoidance goals were a positive predictor of disorganization,  $F(1, 129) = 4.14, p < .05$  ( $\beta = .18$ ), as were performance-avoidance goals,  $F(1, 129) = 13.42, p < .001$  ( $\beta = .32$ ). No other variables attained significance.

**Anticipatory TA.** The regression of state TA on the basic model revealed that performance-avoidance goals were a positive predictor of state TA,  $F(1, 129) = 4.35, p < .05$  ( $\beta = .19$ ), and mastery-avoidance goals were a marginally significant positive predictor,  $F(1, 129) = 3.62, p = .059$  ( $\beta = .18$ ). None of the other variables were significant predictors.

Regressing worry on the basic model revealed that mastery-avoidance goals were a significant positive predictor of worry,  $F(1, 129) = 4.83, p < .05$  ( $\beta = .21$ ), and performance-avoidance

<sup>3</sup> Given the number of interactions tested and their ancillary nature, the conservative significance level of .01 was used across studies (except for the identification interactions in Study 3, which were of central conceptual interest).



Table 5  
Study 2: Intercorrelations Among Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	
1. Overall need for achievement	—																						
2. Workmastery	.87**	—																					
3. Competitiveness	.71**	.27**	—																				
4. Fear of failure	-.23**	-.39**	.10	—																			
5. Self-determination	.26**	.38**	-.03	-.44**	—																		
6. Perceived class engagement	.17	.16	.10	-.21*	.23**	—																	
7. Mastery-approach goals	.20*	.29**	-.03	-.16	.22**	.43**	—																
8. Mastery-avoidance goals	-.06	-.13	.07	.28**	-.17*	.19*	.32**	—															
9. Perf.-approach goals	.31**	.01	.57**	.23**	-.08	-.03	-.13	.05	—														
10. Perf.-avoidance goals	-.09	-.17	.06	.31**	-.17*	.04	-.09	.28**	.18*	—													
11. Deep processing	.16	.19*	.04	-.16	.22**	.08	.26**	.03	.10	-.18*	—												
12. Surface processing	.07	-.03	.18*	.23**	-.08	.13	.11	.22*	.15	.35**	-.03	—											
13. Disorganization	-.05	-.09	.03	.22*	-.25**	.10	.11	.31**	.04	.38**	-.23**	.17	—										
14. State TA	.03	-.08	.18*	.32**	-.36**	.04	-.04	.21*	.16	.26**	-.28**	.19*	.41**	—									
15. Worry	.04	-.06	.17	.28**	-.33**	.02	.03	.25**	.10	.24**	-.24**	.15	.48**	.65**	—								
16. Emotionality	.01	-.07	.12	.37**	-.33**	.12	.06	.32**	.13	.31**	-.14	.23**	.47**	.82**	.60**	—							
17. Subsequent mastery-avoidance goals	.18*	.20*	.06	-.08	.22*	.41**	.73**	.42**	.02	.01	.28**	.09	.02	-.10	-.03	.04	—						
18. Subsequent mastery-avoidance goals	.00	-.08	.11	.20*	-.09	.29**	.27**	.70**	.06	.22*	-.05	.04	.31**	.28**	.29**	.29**	.43**	—					
19. Subsequent perf.-approach goals	.25**	.01	.47**	.19*	-.08	.10	-.05	.14	.74**	.16	.16	.21*	.07	.12	.09	.15	.15	.14	—				
20. Subsequent perf.-avoidance goals	-.06	-.16	.11	.34**	-.26**	.06	-.24**	.18*	.13	.71**	-.28**	.23**	.30**	.28**	.32**	.33**	-.12	.30**	.20**	—			
21. SAT scores	-.13	-.17*	-.01	-.04	-.16	.05	.05	-.09	.23**	-.15	.13	-.15	-.13	.02	-.07	-.02	-.02	-.08	.14	-.17*	—		
22. Gender	.01	.08	-.10	.04	.06	.15	.21*	.01	-.14	.13	-.10	.07	.08	.08	.07	.03	.17*	.11	-.17	.13	-.06	—	

Note. TA = test anxiety; perf. = performance; SAT = Scholastic Aptitude Test.  
\*  $p < .05$ . \*\*  $p < .01$ .

goals were a marginally significant positive predictor,  $F(1, 129) = 2.99, p = .086$  ( $\beta = .16$ ). None of the other predictors attained significance.

Regressing emotionality on the basic model revealed that mastery-avoidance goals were a positive predictor of emotionality,  $F(1, 129) = 7.30, p < .01$  ( $\beta = .25$ ), as were performance-avoidance goals,  $F(1, 129) = 7.37, p < .01$  ( $\beta = .24$ ). A significant Performance-Avoidance Goal  $\times$  Mastery-Approach Goal interaction,  $F(1, 128) = 10.85, p < .005$  ( $\beta = .31$ ), indicated that the positive relationship between performance-avoidance goals and emotionality was strongest in the absence of mastery-approach goals. None of the other variables attained significance.

*Subsequent achievement goals.* Regressing the subsequent achievement goal variables on the basic model yielded strong evidence for the stability of each achievement goal: Mastery-approach goals predicted subsequent mastery-approach goals,  $F(1, 131) = 125.57, p < .001$  ( $\beta = .69$ ), mastery-avoidance goals predicted subsequent mastery-avoidance goals,  $F(1, 131) = 93.70, p < .001$  ( $\beta = .67$ ), performance-approach goals predicted subsequent performance-approach goals,  $F(1, 131) = 148.43, p < .001$  ( $\beta = .74$ ), and performance-avoidance goals predicted subsequent performance-avoidance goals,  $F(1, 131) = 105.56, p < .001$  ( $\beta = .67$ ).<sup>4</sup> In addition, these analyses revealed that mastery-approach goals were a negative predictor of subsequent performance-avoidance goals,  $F(1, 131) = 5.79, p < .05$  ( $\beta = -.16$ ), whereas mastery-avoidance goals were a positive predictor of subsequent mastery-approach goals,  $F(1, 131) = 8.37, p < .005$  ( $\beta = .18$ ), and subsequent performance-approach goals,  $F(1, 131) = 4.24, p < .05$  ( $\beta = .13$ ). No other significant relationships were revealed in these analyses.

In sum, the antecedent and consequence results for mastery-approach, performance-approach, and performance-avoidance goals conformed nicely to predictions. The results for mastery-avoidance goals indicated that these goals were grounded in fear of failure, low self-determination, and perceived class engagement, and that they were positive predictors of disorganized studying, state TA, worry, emotionality, and subsequent mastery-avoidance, mastery-approach, and performance-approach goal regulation.

### Study 3

In Study 3, we were again interested in examining the means and intercorrelations among the four achievement goal variables. However, the primary aim of this study was to investigate several additional and important antecedents and consequences of achievement goal adoption. In the following, we overview our antecedent and consequence predictions; once again, we refrained from generating a priori predictions for mastery-avoidance goals.

One focal set of antecedents was participants' implicit theories about people (Dweck & Leggett, 1988), that is, their beliefs that individuals' characteristics are fixed (entity theory) or malleable (incremental theory). Dweck and Leggett (1988; see also Vandewalle, 1997) hypothesized that entity theory predicts performance goals. In contradistinction, we anticipated that entity theory would be a positive predictor of a specific variant of performance goal, performance-avoidance, because the belief that one's abilities are fixed means that one could be exposed as immutably incompetent given a single poor performance in an achievement situation. In accord with Dweck and Leggett, we anticipated that incremental

theory would positively predict mastery-approach goals, because the belief that one's characteristics are changeable should facilitate attempts to develop one's knowledge and skills in achievement situations.

We also focused on parental socialization as an antecedent of achievement goals. Little research has been conducted on this category of antecedent, despite an explicit appeal for such work by the National Advisory Mental Health Council (1995). Our specific focus was on participants' retrospective reports of how their parents responded to their behavior during childhood. Parental responses can address the person as a whole or the person's specific behaviors and, of course, can be positively or negatively valenced. Parental responses can also communicate conditional approval or induce worry about failing or making mistakes. We expected person-focused negative feedback to be linked to performance-avoidance goals, because such feedback is harsh and punitive and likely to evoke efforts to evade failure at all costs. We expected person-focused positive feedback to be linked to performance-approach goals; such feedback is likely to communicate contingent worth to the child (Mueller & Dweck, 1998), which the child may seek to earn by standing out as competent relative to his or her peers. For the same reason, we expected contingent approval to be linked to performance-approach goals. We did not expect behavior-focused positive or negative feedback to impact achievement goal adoption, as this type of feedback simply communicates information to the child about his or her behavior, without additional messages being conveyed. Inducing worry about mistakes, like person-focused negative feedback, is likely to lead to performance-avoidance goal adoption, as this indicates a tendency to construe failure as a negative event to be avoided, rather than an experience from which to learn. Broad contextual variables can moderate the influence of parental socialization on children (Darling & Steinberg, 1993), and one such variable discussed in the achievement motivation literature is parental identification. The general hypothesis proffered by achievement theorists is that children are most affected by socialization behaviors when they strongly identify with the socialization agent (Argyle & Robinson, 1962). We assessed parental identification in the present study to test this general hypothesis; we offer no a priori predictions.

Our final focal antecedent was competence valuation—the degree to which a person feels competence on a task is important (Harackiewicz, 1989; see also Eccles & Wigfield's, 1995, attainment value construct). Achievement goal adoption of any sort indicates that the person cares about competence at the

<sup>4</sup> In essence, these stability data address whether the achievement goals generalize across sequential achievement tasks within the same context. A related question is whether the goals generalize across achievement contexts. We addressed this question in a separate study by having 113 university undergraduates (42 men, 71 women) complete the achievement goals questionnaire at the beginning of a semester for each of up to four classes. The average within-goal correlations indicated that participants adopted similar achievement goals across classes, although this varied considerably across goal type:  $r = .30$  for mastery-approach goals,  $r = .60$  for mastery-avoidance goals,  $r = .85$  for performance-approach goals, and  $r = .82$  for performance-avoidance goals.

task.<sup>5</sup> In essence, competence valuation represents the quantity of achievement motivation, whereas achievement goals represent the qualitative manifestation of this motivation. Thus, competence valuation should positively predict all types of achievement goals.

To investigate the predictive utility of the four achievement goals, we focused on two important outcomes: participants' performance attainment (arguably the central outcome measure in the achievement motivation literature) and their number of health center visits for illness during the exam-relevant period. We divided exam performance into three variables: overall exam performance, multiple choice (MC) performance, and short-answer/essay (SE) performance. In prior research, we found performance-approach goals to be a positive predictor of these variables and performance-avoidance goals to be a negative predictor; null results were observed for mastery-approach goals (Elliot & McGregor, 1999). We expected to replicate these findings using our new goal measures and additionally controlling for mastery-avoidance goals. Achievement goals have yet to be linked to illness outcomes, but related research has been conducted with the personal (i.e., idiographic) goal construct. Elliot and Sheldon (1998) found avoidance personal goals to be positively associated with self-reported physical symptomatology. This association was presumed to occur because avoidance regulation is accompanied by stress and its physiological concomitants (see Wiebe & Smith, 1997). In accord with this work, we predicted that performance-avoidance goals would be a positive predictor of decrements in physical health as indicated by visits to the university health center for illness.

### Method

#### Participants, Achievement Context, and Procedure

A total of 182 (65 male and 117 female) undergraduates in an introductory level psychology class participated in the study for extra credit. The class was conducted in lecture format, and evaluation was based on a normative grading structure. In group sessions held several times throughout the semester, participants completed the implicit theory, parental socialization, and identification measures, and reported their SAT scores. In a group session, 9 days before their final exam, participants completed the competence valuation measure and the achievement goal questionnaire. During the last week of the semester, participants signed a consent form granting access to their grade and health center data; exam scores were obtained from the course instructor at the end of the semester, and health center information was obtained from university records.

#### Measures (see Table 6 for Reliability Information)

**Implicit theories.** Dweck's (1999) "kind of person" questionnaire was used to assess domain-general implicit theories: entity theory (e.g., "Everyone is a certain kind of person, and there is not much that can be done to really change that") and incremental theory (e.g., "People can always substantially change the kind of person they are"). These four-item measures have been shown to be reliable and valid (Dweck, 1999). Participants' responses on each measure were summed to form the entity theory and incremental theory indexes.

**Parental socialization.** Most of the parental socialization variables were assessed with Rosenberg, Tangney, Denham, Leonard, and Widmaier's (1994) Socialization of Moral Affect (SOMA) Scale, in which participants think back to when they were a young child and rate how their

mother and father would have reacted to various situations on a 1 (*not at all likely*) to 5 (*very likely*) scale. Sample situations and items for the eight-item measures used in this study are as follows: person-focused positive feedback (e.g., "You bring your parent flowers that you picked for him/her;" Would your mother/father say, "What a wonderful person you are"), person-focused negative feedback (e.g., "Your family is eating dinner together, and in an angry outburst you throw a dinner roll at your parent;" Would your mother/father say, "You're not a very nice person"), behavior-focused positive feedback (e.g., "You show your parent the castle you just built with your blocks;" Would your mother/father say, "You did a nice job building that castle"), behavior-focused negative feedback (e.g., "You and your parent are shopping, and you deliberately hide from him/her;" Would your mother/father say, "It's wrong to hide from me when we are shopping"), and conditional approval (e.g., "You are getting ready to leave for your first day of school;" Would your mother/father say, "You know how important it is that you do well in school to make me happy"). Participants' responses on the items for each measure were summed to form indexes for each parent. Worry about mistakes was assessed using the Worry Conducive Climate scale of the Parent-Initiated Motivational Climate Questionnaire-2 (S. White, 1997). In this assessment, participants read the stem, "When I was a young child trying to learn a new skill, I felt that my parent . . ." and responded to five statements for each parent (e.g., "made me afraid to make mistakes") using a 1 (*strongly disagree*) to 5 (*strongly agree*) scale. The measure has been shown to have good reliability and validity (S. White, 1997). Participants' responses were summed to form worry indexes for each parent.

**Parental identification.** Three face-valid items were used to assess identification with parents: "He/she has served as a good model for how to live my life," "As I was growing up, I wanted to be like him/her," and "As I was growing up, I greatly admired him/her." Participants responded using a 1 (*strongly disagree*) to 5 (*strongly agree*) scale, and their responses were summed to form identification indexes for each parent.

**Competence valuation.** Competence valuation was assessed with Elliot et al.'s (2000) two-item measure, revised for the classroom ("It is important to me to do well on the exam" and "I care very much about how well I do on the exam"). This measure has been shown to be reliable and to have predictive utility (Elliot et al., 2000). Participants' responses on the 1 (*not at all true of me*) to 7 (*very true of me*) scales were summed to form the competence valuation index.

**SAT scores.** Participants' verbal and math scores were summed to form a SAT score index.

**Achievement goals.** The achievement goal questionnaire from Study 1 was used to assess participants' goals for the upcoming exam. Participants' responses on the items for each goal were averaged to form the mastery-approach ( $\alpha = .87$ ), mastery-avoidance ( $\alpha = .84$ ), performance-approach ( $\alpha = .96$ ), and performance-avoidance ( $\alpha = .82$ ) goal indexes.

**Exam performance.** The exam consisted of 25 MC questions and 12 SE questions. An MC performance index was created by summing participants' correct responses and multiplying the total by 2 (maximum score = 50). Likewise, an SE performance index was created by summing participants' points for correct responses and multiplying the total by 2 (maximum score = 50). An overall exam performance index was created by summing the MC and SE performance scores.

**Health center visits.** The number of times that participants visited the university health center for illness during the exam-relevant section of the class was summed to form the health center visits index (see Emmons, 1992).

<sup>5</sup> Although work-avoidance goals are sometimes discussed under the achievement goal rubric, we think it is best to conceptualize these goals as objectives that individuals have in achievement settings when they do not have an achievement goal of any type.

Table 6  
Study 3: Descriptive Statistics and Reliabilities

Variable	<i>M</i>	<i>SD</i>	Observed range	Possible range	Cronbach's alpha
Entity theory	14.93	3.96	4–23	4–24	.82
Incremental theory	11.49	3.88	5–23	4–24	.85
Mother person-focused positive feedback	29.16	6.59	11–40	8–40	.82
Mother person-focused negative feedback	18.58	6.51	8–40	8–40	.78
Mother behavior-focused positive feedback	31.65	5.16	14–40	8–40	.85
Mother behavior-focused negative feedback	29.65	6.05	8–40	8–40	.82
Mother conditional approval	19.94	6.43	8–36	8–40	.81
Mother worry	11.57	5.37	5–25	5–25	.88
Mother identification	11.71	2.75	3–5	3–5	.83
Father person-focused positive feedback	25.54	7.50	8–39	8–40	.87
Father person-focused negative feedback	17.65	6.76	8–39	8–40	.81
Father behavior-focused positive feedback	29.08	6.44	8–40	8–40	.85
Father behavior-focused negative feedback	27.86	6.32	8–40	8–40	.82
Father conditional approval	18.23	6.32	8–36	8–36	.81
Father worry	12.45	5.84	5–25	5–25	.91
Father identification	11.92	3.13	3–15	3–15	.86
Competence valuation	12.69	1.74	6–14	2–14	.88
Mastery-approach goals	5.20	1.14	1.67–7	1–7	.87
Mastery-avoidance goals	3.97	1.24	1–7	1–7	.84
Performance-approach goals	4.41	1.88	1–7	1–7	.96
Performance-avoidance goals	4.65	1.47	1–7	1–7	.82
Overall performance	78.99	15.50	16–99	0–100	
MC performance	42.59	6.88	12–50	0–50	
SE performance	36.40	9.39	3–50	0–50	
Health center visits	0.16	0.48	3–0	3–0	
SAT scores	1299.02	115.05	960–1600	0–1600	

Note. MC = multiple choice; SE = short answer/essay; SAT = Scholastic Aptitude Test.

### Results and Discussion

#### Means for and Intercorrelations Among the Achievement Goal Measures

The descriptive statistics, reliabilities, and intercorrelations among the achievement goal (and all other) measures are presented in Tables 6 and 7. As in Studies 1 and 2, the mean for mastery-avoidance goals was close to the scale midpoint but lower than the means for each of the other achievement goals. The zero-order correlations among the measures indicated, as expected, that mastery-avoidance goals were positively associated with both mastery-approach ( $r = .37, p < .001$ ) and performance-avoidance ( $r = .25, p < .001$ ) goals. In accord with Study 2 (and predictions), mastery-avoidance goals were unrelated to performance-approach goals ( $r = .05$ ).

#### Regression Analyses: Predictors of Achievement Goals

Simultaneous regression analyses were conducted to investigate the influence of the antecedent variables on each achievement goal, controlling for SAT scores. The implicit theory regression models consisted of one implicit theory measure and SAT scores. Likewise, the competence valuation model consisted of the competence valuation measure and SAT scores. The parental socialization models comprised a father or mother socialization variable, the identification variable for the applicable parent, and the interaction product term. Preliminary analyses included gender in all models, which was retained in the final model when significant.

**Mastery-approach goals.** Regressing mastery-approach goals on the implicit theory and parental socialization models yielded no significant relationships. The competence valuation analysis revealed that competence valuation was a positive predictor of mastery-approach goals,  $F(1, 167) = 36.30, p < .001$  ( $\beta = .42$ ).

**Mastery-avoidance goals.** In the implicit theory analyses, entity theory was a positive predictor of mastery-avoidance goals,  $F(1, 167) = 5.94, p < .05$  ( $\beta = .19$ ); incremental theory was a negative predictor,  $F(1, 167) = 4.17, p < .05$  ( $\beta = -.16$ ). In the parental socialization analyses, mother person-focused negative feedback positively predicted mastery-avoidance goals,  $F(1, 159) = 6.24, p < .05$  ( $\beta = .20$ ), as did worry,  $F(1, 159) = 12.92, p < .001$  ( $\beta = .28$ ). Likewise, for fathers, person-focused negative feedback,  $F(1, 150) = 5.58, p < .05$  ( $\beta = .21$ ), and worry,  $F(1, 150) = 12.95, p < .001$  ( $\beta = .30$ ), were positive predictors. The competence valuation analysis revealed that competence valuation was a positive predictor of mastery-avoidance goals,  $F(1, 167) = 21.32, p < .001$  ( $\beta = .34$ ).

**Performance-approach goals.** Regressing performance-approach goals on the implicit theory models yielded no significant relationships. In the parental socialization analyses, mother conditional approval was a positive predictor of performance-approach goals,  $F(1, 158) = 4.74, p < .05$  ( $\beta = .17$ ). The behavior-focused Negative Feedback  $\times$  Identification interaction was also significant,  $F(1, 159) = 4.20, p < .05$  ( $\beta = .16$ ); behavior-focused negative feedback was positively related to performance-approach goals when identification was high, but negatively related when identification was low. For fathers, person-focused positive feed-

Table 7  
Study 3: Intercorrelations Among Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1. Entity theory	---																										
2. Incremental theory	-.74**	---																									
3. Mother person-focused PF	.07	-.02	---																								
4. Mother person-focused NF	.09	-.12	-.03	---																							
5. Mother behavior-focused PF	-.02	.00	.61**	-.18*	---																						
6. Mother behavior-focused NF	.01	-.02	.29**	.10	.32**	---																					
7. Mother conditional approval	.13	-.07	.58**	.21**	.31**	.06	---																				
8. Mother worry	.07	-.16*	-.22**	.58**	-.38**	-.17*	.00	---																			
9. Mother identification	.01	-.02	.28**	-.24**	.36**	.26**	.06	-.25**	---																		
10. Father person-focused PF	.05	.02	.65**	-.08	.50**	.34**	.38**	-.25**	.22**	---																	
11. Father person-focused NF	.03	-.06	.08	.74**	.00	.15	.14	.38**	-.02	.16*	---																
12. Father behavior-focused PF	.06	-.06	.40**	-.18*	.63**	.27**	.16*	-.24**	.23**	.71**	-.23**	---															
13. Father behavior-focused NF	-.01	.00	.35**	.09	.37**	.74**	.16*	-.12	.20**	.48**	.12	.51**	---														
14. Father conditional approval	.12	-.06	.51**	.11	.26**	.14	.82**	-.04	.14	.68**	-.02	.45**	.33**	---													
15. Father worry	.04	-.12	-.10	.37**	-.18*	-.12	.01	.68**	-.09	-.27**	.52**	-.28**	-.12	-.06	---												
16. Father identification	.13	-.05	.14	-.05	.05	.08	.13	-.05	.30**	.34**	-.29**	.38**	.23**	.24**	-.28**	---											
17. Competence valuation	.16*	-.15	.14	.13	.06	.16*	.15	.03	.08	.10	.07	.03	.11	.12	.08	.17*	---										
18. Mastery-approach goals	.11	-.05	.10	.01	.07	.00	.11	.02	.11	-.01	.07	-.04	.01	.05	.04	.01	.42**	---									
19. Mastery-avoidance goals	.19*	-.16*	.12	.19*	-.05	.01	.13	.27**	-.05	.03	.15	-.05	.03	.09	.26**	.07	.33**	.40**	---								
20. Performance-approach goals	.07	-.07	.06	.15	-.08	.00	.16*	.17*	-.06	.20**	.06	.11	.15	.20*	.07	.15	.30**	.09	.05	---							
21. Performance-avoidance goals	.13	-.09	.10	.17*	.02	.11	.16*	.15	-.04	-.03	.15	-.08	.06	.04	.07	.03	.18*	-.05	.24**	.21**	---						
22. Overall exam performance	.00	-.01	.09	-.20*	-.01	-.07	-.04	.01	.07	-.01	-.16*	.03	-.08	-.08	.02	.03	.04	.11	-.08	.14	-.29**	---					
23. MC performance	-.01	-.02	.07	-.18*	-.01	-.07	-.06	.02	.04	-.04	-.17*	.03	-.05	-.10	.04	.00	.01	.06	-.08	.12	-.33**	.94**	---				
24. SE performance	.01	.00	.10	-.20*	-.01	-.07	-.01	.00	.08	.02	-.15	.02	-.10	-.07	.01	.05	.06	.14	-.07	.15	-.24**	.97**	.81**	---			
25. Health center visits	.04	-.03	.05	.16*	-.01	.10	.01	.04	.08	-.01	.13	-.02	.15	.03	.04	.01	.09	-.22**	-.09	-.03	.14	-.21**	-.17*	-.22**	---		
26. SAT scores	.08	-.08	-.08	.11	-.09	.01	-.13	.07	-.05	-.03	-.03	.10	.03	-.09	.04	.08	-.04	-.09	.04	.10	-.30**	.20**	.23**	.17*	-.05	---	
27. Gender	.01	-.11	.03	.01	.11	.08	-.11	.06	.15	.02	.04	.09	.03	-.06	.07	-.06	-.04	.06	-.03	-.11	.05	.02	-.01	.04	-.08	.22**	---

Note. PF = positive feedback; NF = negative feedback; MC = multiple choice; SE = short answer/essay; SAT = Scholastic Aptitude Test.  
\*  $p < .05$ . \*\*  $p < .01$ .

back was a positive predictor of performance-approach goals,  $F(1, 149) = 4.61, p < .05$  ( $\beta = .18$ ), as was conditional approval,  $F(1, 149) = 5.92, p < .05$  ( $\beta = .18$ ). The competence valuation analysis revealed that competence valuation positively predicted performance-approach goals,  $F(1, 167) = 16.61, p < .001$  ( $\beta = .30$ ).

*Performance-avoidance goals.* The implicit theory analyses revealed that entity theory was a positive predictor of performance-avoidance goals,  $F(1, 167) = 4.49, p < .05$  ( $\beta = .16$ ); incremental theory yielded null results. In the parental socialization analyses, mother person-focused negative feedback was a positive predictor of performance-avoidance goals,  $F(1, 159) = 8.24, p < .005$  ( $\beta = .22$ ), as was worry,  $F(1, 159) = 5.88, p < .05$  ( $\beta = .19$ ). For fathers, only person-focused negative feedback was a positive predictor of performance-avoidance goals,  $F(1, 150) = 5.10, p < .05$  ( $\beta = .19$ ). The competence valuation analysis revealed that competence valuation was a positive predictor of performance-avoidance goals,  $F(1, 167) = 5.24, p < .05$  ( $\beta = .17$ ). SAT scores were a significant negative predictor in each analysis ( $\beta$ s ranged from  $-.30$  to  $-.34, p < .001$ ).

#### *Regression Analyses: Achievement Goals as Predictor Variables*

Simultaneous regression analyses were conducted to investigate the influence of the achievement goal variables on the exam performance and health center visit variables, controlling for SAT scores. The basic model for these analyses contained the four achievement goals and SAT scores. All two-way achievement goal interactions were included in preliminary analyses, and significant interactions were retained in the final models. Likewise, a separate set of preliminary analyses included gender, which was retained in the final model when significant.

*Exam performance.* Regressing overall exam performance on the basic model revealed that performance-approach goals were a positive predictor of exam performance,  $F(1, 163) = 5.35, p < .05$  ( $\beta = .18$ ), whereas performance-avoidance goals were a negative predictor,  $F(1, 163) = 10.42, p < .005$  ( $\beta = -.27$ ). No other variables were significant (mastery-avoidance goals  $\beta = -.07$ ).

The regression of MC performance on the basic model revealed that performance-approach goals were a positive predictor of MC performance,  $F(1, 163) = 4.77, p < .05$  ( $\beta = .17$ ), whereas performance-avoidance goals were a negative predictor,  $F(1, 163) = 13.84, p < .001$  ( $\beta = -.31$ ). No other variables attained significance (mastery-avoidance goals  $\beta = -.03$ ).

Regressing SE performance on the basic model revealed that performance-approach goals were a positive predictor of SE performance,  $F(1, 163) = 4.84, p < .05$  ( $\beta = .17$ ), whereas performance-avoidance goals were a negative predictor,  $F(1, 163) = 6.70, p = .01$  ( $\beta = -.22$ ). No other variables attained significance (mastery-avoidance goals  $\beta = -.09$ ).

*Health center visits.* The regression of health center visits on the basic model revealed that mastery-approach goals were a negative predictor of health center visits,  $F(1, 163) = 3.96, p < .05$  ( $\beta = -.16$ ), whereas performance-avoidance goals were a positive

predictor,  $F(1, 163) = 3.98, p < .05$  ( $\beta = .17$ ). A significant Mastery-Approach Goal  $\times$  Performance-Avoidance Goal interaction,  $F(1, 163) = 10.84, p < .005$  ( $\beta = -.25$ ), indicated that the positive relationship between performance-avoidance goals and health center visits was strongest in the absence of mastery-approach goals. No other variables attained significance (mastery-avoidance goals  $\beta = -.07$ ).

In sum, the antecedent and consequence results for mastery-approach, performance-approach, and performance-avoidance goals conformed nicely to predictions, although one exception (incremental theory failed to predict mastery-approach goals) and a few unanticipated, but theoretically sensible, relationships (e.g., mastery-approach goals were negative predictors of health center visits) also emerged. All socialization results held across levels of identification, and only one identification interaction was observed, thereby highlighting the strength and inevitable impact of parental socialization processes. The antecedent and consequences results for mastery-avoidance goals indicated that these goals were grounded in entity (and not incremental) theory, mother and father person-focused negative feedback, mother and father worry induction, and competence valuation, and that they, unlike performance-avoidance goals, were not negative predictors of exam performance nor positive predictors of health center visits.

#### General Discussion

In the present research, three studies were conducted to investigate the  $2 \times 2$  achievement goal framework, with a particular emphasis on the mastery-avoidance goal construct. Results from all three studies provided strong support for both the new framework and the new construct. Specifically, the obtained results successfully addressed each of our five stated objectives.

First, a face-valid measure of mastery-avoidance goals was devised, and this measure was shown to possess good internal consistency. Likewise, face-valid and reliable indicators of the other three goals in the  $2 \times 2$  framework were also constructed. Second, both EFAs and CFAs documented that each of the goals in the  $2 \times 2$  framework represent distinct constructs. The CFA procedures also indicated that the  $2 \times 2$  framework provided a better fit to the data than the trichotomous framework or other plausible alternatives. Third, examination of the mastery-avoidance goal scores across studies revealed that these goals are clearly operative in the undergraduate classroom (the means were close to the scale midpoint, and the full range of scores was used), although to a somewhat lesser extent than the other three goals. In addition, mastery-avoidance goals were consistently correlated with the goals in the  $2 \times 2$  framework with which they shared a conceptual dimension (mastery-approach and performance-avoidance), whereas they evidenced no consistent association with the other goal (performance-approach). In fact, this pattern was evident for all four goals, in that the goals sharing a competence dimension were positively associated with each other (average  $r = .25$ ), whereas those not sharing a competence dimension were unrelated (average  $r =$

Table 8  
 Summary of Antecedent and Consequence Results: Studies 2 and 3

Type of result	Achievement goal			
	Mastery approach	Mastery avoidance	Performance approach	Performance avoidance
Antecedents	Overall need for achievement (+) Workmastery (+) Self-determination (+) Competence valuation (+) Perceived class engagement (+)	Fear of failure (+) Self-determination (-) Entity theory (+) Incremental theory (-) Mother person-focused NF (+) Father person-focused NF (+) Mother worry (+) Father worry (+) Competence valuation (+) Perceived class engagement (+)	Overall need for achievement (+) Competitiveness (+) Fear of failure (+) Father person-focused PF (+) Father conditional approval (+) Mother conditional approval (+) Competence valuation (+)	Fear of failure (+) Self-determination (-) Entity theory (+) Mother person-focused NF (+) Father person-focused NF (+) Mother worry (+) Competence valuation (+)
Consequences	Deep processing (+) Subsequent mastery-approach goals (+) Subsequent performance avoidance goals (-) Health center visits (-)	Disorganization (+) [State TA (+)] Worry (+) Emotionality (+) Subsequent mastery avoidance goals (+) Subsequent mastery approach goals (+) Subsequent performance approach goals (+)	[Surface processing (+)] Subsequent performance approach goals (+) Overall exam performance (+) MC performance (+) SE performance (+)	[Deep processing (-)] Surface processing (+) Disorganization (+) State TA (+) [Worry (+)] Emotionality Subsequent performance avoidance goals (+) Overall exam performance (-) MC performance (-) SE performance (-) Health center visits (+)

Note. (+) = positive relationship; (-) = negative relationship; TA = test anxiety; PF = positive feedback; NF = negative feedback; MC = multiple choice; SE = short answer/essay. All relationships are  $p < .05$  at minimum except those in brackets, which are  $p < .10$ .

.03).<sup>6</sup> Fourth, each of the goals in the 2 × 2 framework was linked to a distinct set of antecedent variables. Fifth, each of the goals in the 2 × 2 framework predicted a distinct pattern of achievement-relevant processes and outcomes. These distinct empirical profiles further highlight the need to attend to each of the four achievement goals separately; combining the two mastery or two avoidance goal constructs would clearly have led to a different set of results and conclusions.<sup>7</sup> The antecedent and consequence results will now be discussed more thoroughly, beginning with, and primarily featuring, the findings for mastery-avoidance goals.

The antecedent results for mastery-avoidance goals indicated that these goals were grounded in fear of failure, low self-determination, perceived classroom engagement, entity (and not incremental) theory, mother and father person-focused negative feedback, mother and father worry induction, and competence valuation. These results are consistent with our general hypothesis that mastery-avoidance goals have a more negative set of antecedents than mastery-approach goals and a more positive set than performance-avoidance goals (Table 8 presents the empirical patterns for each goal). Mastery-avoidance and performance-avoidance goals evidenced highly similar antecedent profiles in terms of nonoptimal variables (e.g., fear of failure, low self-determination). However, unlike performance-avoidance goals, and like mastery-approach goals, mastery-avoidance goals emerged from individuals' perceptions that the class was engaging and interesting. This mixed antecedent profile is concordant with the mixed conceptual profile for mastery-avoidance goals (they represent a combination of optimal and nonoptimal components:

<sup>6</sup> These average associations were computed with the achievement goal measures from each study and the subsequent achievement goal measures from Study 2. It is interesting to note that the positive association between the goals sharing a competence dimension was quite strong for three of the four pairings—mastery-approach and mastery-avoidance ( $r = .38$ ), mastery-avoidance and performance-avoidance ( $r = .29$ ), and performance-approach and performance-avoidance ( $r = .26$ )—and quite a bit weaker for the remaining pairing—mastery-approach and performance-approach ( $r = .08$ ; although  $r = .14$  with the Study 2 association, which is clearly an outlier, excluded).

<sup>7</sup> This point may be illustrated by contrasting the antecedent and consequence results reported here with those obtained from ancillary analyses using Trichotomous Models A (performance-approach goals, performance-avoidance goals, and an omnibus mastery goals construct) or B (mastery-approach goals, performance-approach goals, and an omnibus avoidance goals construct). The results obtained using each trichotomous model differed from the 2 × 2 results in all possible ways. For example, in contrasting Trichotomous Model B with the 2 × 2 framework, we observed the following patterns: (a) Omnibus avoidance goals, like mastery-avoidance goals, were significant; performance-avoidance goals were not (e.g., predicting subsequent mastery-approach goals in Study 2); (b) omnibus avoidance goals, like mastery-avoidance goals, were not significant; performance-avoidance goals were significant (e.g., predicting health center visits in Study 3); (c) omnibus avoidance goals, like performance-avoidance goals, were significant; mastery-avoidance goals were not (e.g., predicting surface processing in Study 2); and (d) omnibus avoidance goals, like performance-avoidance goals, were not significant; mastery-avoidance goals were significant (e.g., being predicted by perceived class engagement in Study 2). Each of these patterns was also observed when contrasting Trichotomous Model A with the 2 × 2 framework.

mastery and avoidance) and suggests that the adoption of these goals may be most likely among individuals who bring nonoptimal motivational dispositions into optimally structured achievement settings that foster intrinsic interest and the pursuit of challenge. An important item on the research agenda is to examine this possibility using observer judgments, in addition to participant perceptions, to assess characteristics of the achievement setting (see A. Ryan, Gheen, & Midgley, 1998).

The consequences results for mastery-avoidance goals revealed these goals to be positive predictors of disorganized studying, anticipatory TA (state TA, worry, and emotionality), subsequent mastery-avoidance goals, subsequent mastery-approach goals, and subsequent performance-approach goals. These findings support our general hypothesis that mastery-avoidance goals have a more negative pattern of consequences than mastery-approach goals and a more positive pattern than performance-avoidance goals. Mastery-avoidance goals shared some deleterious processes with performance-avoidance goals, but, importantly, mastery-avoidance goals diverged from performance-avoidance goals in that they were neither negative predictors of performance attainment nor positive predictors of health center utilization. Thus, mastery-avoidance goals not only evoked fewer negative processes, but apparently those they did evoke did not eventuate in negative outcomes. Mastery-avoidance goals, in fact, evidenced some positive qualities, as they, unlike performance-avoidance goals, facilitated the subsequent adoption of approach goals, both mastery-approach and performance-approach. These results clearly indicate that not all avoidance goals should be considered equally inimical—performance-avoidance goals appear to be the primary regulatory vulnerability in achievement settings.

The present research not only established the first antecedent and consequence profile for mastery-avoidance goals but also further validated and extended the nomological network of the other three goals in the context of the full  $2 \times 2$  framework. In Studies 2 and 3, we successfully replicated previously obtained findings regarding motive dispositions, study strategies, and exam performance. This was an important and foundational aspect of the research, as it documented the comparability of the new and old achievement goal measures and indicated that the predictive utility of the goals in the trichotomous model remained invariant when controlling for mastery-avoidance goal variance. Numerous new findings were also obtained, including those for the parental socialization and health center visits variables.

The parental socialization analyses yielded null findings for mastery-approach goals. This seems consistent with R. White's (1959) proposal that mastery pursuits are an inherent aspect of human nature that need no external inducement, entrainment, or reinforcement (see also R. Ryan & Deci, 2000; Elliot, McGregor, & Thrash, in press). Performance-approach goals were linked to conditional approval for mothers and fathers and person-focused positive feedback for fathers. Thus, at least for some persons, the pursuit of such goals represents an attempt to earn acceptance and love from one's parents at the dynamic level, the outward expression of which is likely the presence of a contingency between one's positive achievement outcomes and one's sense of global value and worth. Such self-worth contingencies are a heavy burden to bear in achievement settings (Burhans & Dweck, 1995; Covington & Beery, 1976; Nicholls, 1984; R. Ryan, 1982), and it is for this reason that we suspect that performance-approach goals

will at some point be shown to have deleterious consequences for some variables (e.g., subjective well-being, long-term interest). Performance-avoidance goals were linked to person-focused negative feedback for mothers and fathers and worry induction for mothers. Thus, the pursuit of performance-avoidance goals appears to represent an attempt to evade global devaluation by one's parents at the dynamic level, the outward manifestation of which is likely the presence of a contingency between one's negative achievement outcomes and one's overall sense of self-worth. As such, it should come as little surprise that these goals are associated with widespread inimical consequences. It should be noted, however, that mastery-avoidance goals share similar socialization antecedents yet do not evidence such a negative pattern of consequences. Clearly, both the motivational factors underlying the goal and the goal itself have an important impact on achievement-relevant processes and outcomes.

Our results for health center visits are provocative in that they suggest that the qualitative nature of individuals' competence pursuits may have implications for their physical well-being. As hypothesized, performance-avoidance goals were positive predictors of health center visits; unexpectedly, mastery-approach goals evidenced a negative relationship. If indeed the pursuit of mastery-approach goals is a natural, default regulatory tendency in achievement settings, it may be that following this inherent tendency facilitates health and well-being and serves as a prophylactic for illness. These findings raise several issues that warrant additional research attention, perhaps most central being the precise mediational mechanisms that account for the relationships. It would be valuable to examine whether performance-avoidance regulation induces daily psychological stress (Suls & Rittenhouse, 1990); whether mastery-approach regulation facilitates need satisfaction (Sheldon & Elliot, 1999); and the way in which goal pursuit, stress, and need satisfaction affects the physiologically based variables (e.g., natural killer cell activity) that likely serve as proximal mediators. In addition, it would be ideal to conduct further research on these issues using objective indicators of ill-health, as well as health center visit data. Together, the parental socialization and health center visit results highlight the need for expanded research on developmental considerations in the achievement motivation literature, as the manner in which parents engage their children in the competence domain is likely to have a longstanding impact that pervades all areas of functioning.

In discussing our findings, we have proceeded under the assumption that the relationships observed were causal in nature. However, given that the results from our studies were correlational, it is not possible to make definitive statements regarding causality. In addition, the present work was conducted with undergraduates in a single type of achievement context, the college classroom. The extent to which our findings are generalizable to other types or ages of individuals and other achievement domains (e.g., sports) is not known. Finally, the present research used self-attributed measures of motives and nomothetic measures of goals. In future work, it would be interesting to examine the motive-goal links using implicit motive measures (see McClelland, 1987) and to explore whether the definition dimension of competence also applies to idiographic achievement goals (see Elliot & Sheldon, 1997, with regard to the valence dimension).

In constructing the trichotomous (Elliot & Harackiewicz, 1996) and  $2 \times 2$  achievement goal frameworks, we have added a third



(performance-avoidance) and fourth (mastery-avoidance) goal construct to a conceptual approach that initially consisted of a mastery-performance goal dichotomy. Pioneers of the achievement goal approach recognized the rudimentary nature of the dichotomous framework and acknowledged the eventual need to develop a more elaborate conceptualization (see Henderson & Dweck, 1990). The simplicity and straightforwardness of the mastery-performance dichotomy is one of its appealing features and has undoubtedly helped this approach garner widespread theoretical and empirical attention in the achievement motivation literature. As such, those who seek to revise the dichotomous framework should do so with great care, making sure to extend the explanatory breadth of the achievement goal approach without losing its straightforward appeal or, worse yet, undermining its coherence altogether with an unsystematic accumulation of constructs. A reasonable question to ask of the 2 × 2 framework is whether it successfully strikes this balance.

We think the answer is affirmative and suggest that the reason the 2 × 2 framework is able to strike this balance is that it possesses a conceptual centerpiece—competence—that serves as a guide for theoretical development. Competence can only be construed in a limited number of ways, therefore, establishing competence as the conceptual centerpiece of achievement goals naturally constrains the number of goal constructs that may be delineated. Furthermore, we have argued that there are two dimensions integral to competence, how it is defined and how it is valenced, and that different achievement goals are composed of distinct combinations of these dimensions. As such, the number of potential achievement goal constructs is not only constrained, but constrained in systematic fashion. Importantly, this systematic framework retains a reasonable degree of simplicity and straightforwardness; the original dichotomous framework comprises two goals, whereas the proposed revision comprises two dimensions. Finally, the 2 × 2 framework is more comprehensive than the mastery-performance dichotomy in that it accounts for additional (and important) variants of achievement goals and does so in precise fashion. In sum, we think the 2 × 2 revision maintains the appealing characteristics of the original, while affording an extended conceptualization that has a broader reach, yet is not in danger of construct proliferation.

At present, we view definition and valence as the only conceptual dimensions that are fundamental, inherent aspects of competence, therefore, we construe these dimensions as sufficient to comprehensively model achievement strivings. Within these dimensions, the only plausible avenue for further development that we foresee entails creating separate goals for the absolute and intrapersonal definitions of competence. Absolute and intrapersonal standards are conceptually separable, the remaining question being whether they are empirically separable and possess differential predictive utility. Thus, from our present vantage point, the maximum degree of complexity that we envision for a mature achievement goal framework is a 3 × 2 conceptualization.

In closing, it is important to highlight that motivation in achievement settings is quite complex and that achievement goals are but one of several types of operative variable to be considered. Many of the desires, concerns, and foci that individuals bring to achievement settings or that are activated in such settings have little to do with competence per se (e.g., those involving affiliation, self-presentation, or self-validation), and these factors can also exert an

important influence on achievement-relevant processes and outcomes (see Dweck, 1999). Indeed, achievement goal regulation (i.e., the actual pursuit of achievement goals) invariably implicates both the achievement goal itself and some other, typically higher order, motivationally relevant variable or variables (see Thrash & Elliot, in press). Clearly, one of the next major tasks for achievement goal theorists is to acquire a more precise understanding of how achievement goals function in concert with these other variables during the regulatory process. It is hoped that the 2 × 2 framework established here will serve as a useful theoretical and empirical tool in addressing this issue and the many additional important issues that await attention in the achievement goal literature and in the achievement motivation literature more broadly.

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