Achievement Goals and Achievement Emotions: Testing a Model of Their Joint Relations With Academic Performance

Reinhard Pekrun
University of Munich

Andrew J. Elliot
University of Rochester

Markus A. Maier
Stony Brook University

The authors propose a theoretical model linking achievement goals and achievement emotions to academic performance. This model was tested in a prospective study with undergraduates ($N = 213$), using exam-specific assessments of both goals and emotions as predictors of exam performance in an introductory-level psychology course. The findings were consistent with the authors' hypotheses and supported all aspects of the proposed model. In multiple regression analysis, achievement goals (mastery, performance approach, and performance avoidance) were shown to predict discrete achievement emotions (enjoyment, boredom, anger, hope, pride, anxiety, hopelessness, and shame), achievement emotions were shown to predict performance attainment, and 7 of the 8 focal emotions were documented as mediators of the relations between achievement goals and performance attainment. All of these findings were shown to be robust when controlling for gender, social desirability, positive and negative trait affectivity, and scholastic ability. The results are discussed with regard to the underdeveloped literature on discrete achievement emotions and the need to integrate conceptual and applied work on achievement goals and achievement emotions.

Keywords: achievement goals, achievement emotions, anxiety, achievement, performance

The goals that students pursue in evaluative settings have been widely studied in the achievement motivation literature. This research has clearly demonstrated that achievement goals have an important influence on students' ongoing motivation and performance attainment (Dweck, 1986; Elliot, 1997; Nicholls, 1984). Achievement emotions are also of critical importance for students' learning and performance, as suggested by test anxiety research as well as recent studies on achievement emotions other than anxiety (Schutz & Pekrun, 2007; Zeidner, 1998). However, despite the many functional similarities of achievement goals and achievement emotions, empirical work on these two constructs has typically taken place in separate research traditions and has produced largely independent bodies of knowledge. As such, there is a surprising lack of understanding of (a) the interrelations between achievement goals and achievement emotions and (b) the joint influence of these goals and emotions on performance attainment.

The present research was designed to address these gaps in the achievement motivation and emotion literatures and, therefore, to facilitate the integration of two important research traditions. Specifically, our first aim was to test our recently proposed model (Pekrun, Elliot, & Maier, 2006) of the relations between achievement goals and achievement emotions, using a refined, situationally specific approach to assessing both goals and emotions. Our second, and most important, aim was to extend Pekrun et al.'s (2006) model to include the influence of both achievement goals and achievement emotions on academic performance. In our extended model, we posit that achievement goals influence achievement emotions and that these emotions, in turn, influence students' performance attainment. That is, we propose that achievement emotions serve the role of mediators of the influence of achievement goals on academic performance.

Achievement Goals and Achievement Emotions Conceptualized

In the present research, *achievement goals* are defined as competence-relevant aims that individuals strive for in achievement settings. Initial work on achievement goals used a dichotomous framework grounded in the mastery–performance distinction (Dweck, 1986; Nicholls, 1984), with mastery goals focusing on the development of competence, and performance goals focusing on the demonstration of competence.[1] More recent work additionally distinguishes between approach and avoidance achievement goals.

---

[1] Other terms, such as *learning versus performance goals* and *task versus ego goals* have also been used in the dichotomous model. In the present work, we use the terms *mastery versus performance goals*, because they are the modal designations used in the literature.

This distinction was first applied to performance goals, providing a bifurcation of these goals and rendering a trichotomous goal framework (Elliot & Harackiewicz, 1996). In the trichotomous conception, three goals are addressed: a mastery goal (an approach goal focused on attaining competence as defined by task-based or intrapersonal standards), a performance-approach goal (an approach goal focused on attaining competence defined by normative standards), and a performance-avoidance goal (an avoidance goal focused on avoiding incompetence as defined by normative standards). Later mastery-avoidance goals were added, thus rendering a 2 × 2 taxonomy of achievement goals (Elliot, 1999). In the present research, we focus on the goals most commonly endorsed in kindergarten through 12th grade and undergraduate classrooms (see Elliot & McGregor, 2001) and therefore use the trichotomous model.

Emotions are defined in contemporary emotion research as multiple component processes that comprise specific affective, cognitive, physiological, and behavioral elements (Scherer, 2000; e.g., for anxiety: nervous feelings, worries, increased activation, anxious facial expression). As compared with intense emotions, *moods* are of lower intensity and lack a specific referent (Pekrun, 2006; Rosenberg, 1998). Different emotions and moods are often compiled in the more general constructs of positive versus negative *affect* (Tellegen, Watson, & Clark, 1999). In most prior research on achievement goals and emotions, these more general constructs have been used, with positive affect being measured as an omnibus variable comprising emotions such as enjoyment, pride, and satisfaction, and negative affect as an omnibus variable comprising emotions such as anxiety, frustration, and sadness (e.g., Pintrich, 2000). Emotion constructs can relate to momentary emotional episodes and moods or to dispositional tendencies to experience momentary emotions and moods. The terms *trait emotions* (e.g., trait anxiety; Spielberger, 1972) and *trait affectivity* (e.g., Watson & Clark, 1984) are used to denote dispositional tendencies to experience specific emotions or positive versus negative emotions in general, respectively.

Achievement emotions are defined as emotions relating to competence-relevant activities or outcomes, thus being different from mood by having a specific referent (Pekrun, 2006). In past research, studies on achievement emotions typically focused on emotions relating to achievement outcomes (e.g., test anxiety, Zeidner, 2007; emotions following success and failure, Weiner, 1985); emotions relating to the achievement activity itself have typically been neglected. The differentiation of activity versus outcome emotions pertains to the *object focus* of achievement emotions. In addition, both activity emotions and outcome emotions can be grouped according to their *valence* (positive vs. negative or pleasant vs. unpleasant), thus rendering a 2 × 2 taxonomy of achievement emotions. Examples of positive and negative activity emotions are enjoyment, boredom, and anger; examples of positive and negative outcome emotions are hope, pride, anxiety, hopelessness, and shame (Pekrun, Goetz, Titz, & Perry, 2002a).

Prior Research on Achievement Goals, Emotions, and Academic Performance

In the following sections, we review research on the relation between achievement goals and emotions, and on the relation of both goals and emotions with academic performance (for other relevant reviews, see Elliot & Moller, 2003; Linnenbrink, 2007; Pekrun et al., 2002a; Zeidner, 2007).

Achievement Goals and Emotions

Achievement goals and positive versus negative affect. Most of the existing research on achievement goals and emotions has been conducted using the dichotomous model of achievement goals, with the underlying assumption that mastery goals are beneficial, and performance goals detrimental, to affective experience. Similarly, as noted earlier, most of these studies have used general, two-dimensional conceptions of positive versus negative affect, rather than focusing on distinct constructs of discrete emotions. Mastery goals have been consistently positively related to students' general positive affect across age groups (elementary through high school), academic domains (mathematics, science), and school learning in general (Kaplan & Maehr, 1999; Linnenbrink, 2005; Meece, Blumenfeld, & Hoyle, 1988; Nicholls, Patashnick, & Nolen, 1985; Nolen & Haladyna, 1990; Pintrich, 2000; Roeser, Midgley, & Urdan, 1996; Seifert, 1995). In contrast, relations between mastery goals and general negative affect have been inconsistent, with negative relations observed in some studies (Linnenbrink, 2005; Linnenbrink, Ryan, & Pintrich, 1999; Seifert, 1995) and null relations observed in others (Meyer, Turner, & Spencer, 1997; Pintrich, 2000; J. C. Turner, Thorpe, & Meyer, 1998).

Relations between performance goals and affect have likewise been inconsistent. In most existing studies, performance goals have been operationalized as performance-approach goals. When operationalized in this way, performance goals have been shown to be either positively related or unrelated to both general positive and general negative affect (Elliott & Dweck, 1988; Linnenbrink, 2005; Meece et al., 1988; Meyer et al., 1997; Nolen & Haladyna, 1990; Roeser et al., 1996, Time 2 measures; Seifert, 1995; J. C. Turner et al., 1998). A few studies have used an omnibus performance goal measure (comprising both approach and avoidance items) and focused on general positive affect, and found the two constructs to be unrelated (Nicholls et al., 1985; Roeser et al., 1996, Time 1 measures). Other research has used a separate performance-avoidance goal measure and focused on negative affect, and found that the two were sometimes related to negative affect but at other times exhibited a null relation (Sideridis, 2003, 2005a).

Achievement goals and discrete achievement emotions. In addressing the inconsistencies in the literature, Pekrun et al. (2006) argued that more specific conceptions of both achievement goals and achievement emotions are needed in analyzing the goal–emotion link. Specifically, they proposed that the approach–avoidance aspect of achievement goals should be taken into account (as in the aforementioned research by Sideridis, 2003, 2005a) and that various discrete emotions should be distinguished, including both activity-related and outcome-related emotions. Pekrun et al.'s model posited specific links between mastery goals and activity emotions, and between performance-based goals and outcome emotions.

The available evidence on achievement goals and discrete emotions is in line with this specificity hypothesis. Test anxiety is the emotion that has received the most attention. In studies across

various age groups (elementary school through college), the relations between mastery and performance-approach goals and students' test anxiety have been weak or nonsignificant (Elliot & Church, 1997; Linnenbrink, 2005; Middleton & Midgley, 1997; Pajares & Cheong, 2004; Pintrich, 2000; Sideridis, 2005a; Skaalvik, 1997; Tanaka, Takehara, & Yamauchi, 2006; Wolters, Yu, & Pintrich, 1996; Zusho, Pintrich, & Cortina, 2005). In contrast and without exception, performance-avoidance goals have been shown to be positively related to test anxiety (Cury, Elliot, Sarrazin, Da Fonseca, & Rufo, 2002; Elliot & McGregor, 1999; Kumar & Jagacinski, 2006; McGregor & Elliot, 2002; Middleton & Midgley, 1997; Pajares & Cheong, 2004; Sideridis, 2005a; Skaalvik, 1997; Tanaka et al., 2006; Zusho et al., 2005). Thus, there is ample and consistent evidence for a specific link between performance-avoidance goals and test anxiety.

In two recent sets of studies, investigations of the specificity hypothesis have extended beyond test anxiety. First, in prospective studies with samples of American and German college students, Pekrun et al. (2006) analyzed the predictive relations between students' mastery, performance-approach, and performance-avoidance goals for a psychology class and their subsequent emotions experienced in the class later in the semester. Mastery goals positively predicted enjoyment of learning, hope, and pride, and negatively predicted boredom and anger. Performance-approach goals were positive predictors of pride, whereas performance-avoidance goals were positive predictors of anxiety, shame, and hopelessness. These findings were largely in line with the predictions of Pekrun et al.'s model that activity emotions (enjoyment, boredom, and anger) are linked to mastery goals, that positive outcome emotions (hope, pride) are linked to performance-approach goals, and that negative outcome emotions (anxiety, shame, and hopelessness) are linked to performance-avoidance goals. However, the observed relations for mastery goals with hope and pride, and the lack of a relation between performance-approach goals and hope, were not anticipated.

Second, Daniels et al. (in press) used cluster analysis to group students according to their mastery and performance-approach goals assessed early in the semester, and used cluster membership to predict students' enjoyment, boredom, and anxiety experienced later in the semester. Students in the multiple goals (high mastery, high performance approach) and mastery goals (high–low) clusters had higher values for enjoyment and lower values for boredom than students in either the performance-approach goals (low–high) or unmotivated (low–low) clusters. These findings are in line with the prediction that mastery goals are linked to activity emotions.

In summary, relations between achievement goals and general positive and negative affect have been inconsistent across studies, with the exception of a positive relation between mastery goals and positive affect. Links between achievement goals and more specific emotion variables have been more consistent, with the relation between performance-avoidance goals and test anxiety being the best documented. Recent research suggests that there are also specific links between mastery goals and activity emotions (such as enjoyment and boredom), performance-approach goals and positive outcome emotions (such as pride), and performance-avoidance goals and negative outcome emotions (such as shame and hopelessness) in addition to anxiety. More research is needed, however, to produce cumulative and more refined information on these relations. Most previous studies have relied on measures of

students' achievement goals in general or for an entire class. Research is needed that examines goal–emotion links in a more specific way, assessing both constructs with temporally and situationally circumscribed measures.

Achievement Goals and Academic Performance

Numerous studies have addressed the relation between students' achievement goals and their performance on various tasks. There is a fair amount of variability in the results from such studies, as might be expected given the diversity of goal measures, tasks, contexts, and age of participants in this research (Elliot, Shell, Bouas Henry, & Maier, 2005; Kaplan & Maehr, 2007; Linnenbrink-Garcia, Tyson, & Patall, in press; Midgley, Kaplan, & Middleton, 2001). Nevertheless, discernable patterns have emerged from the published work, particularly for performance-based goals. Performance-approach goals are often positive predictors of performance outcomes (Elliot & Church, 1997; Lopez, 1999; Skaalvik, 1997; Tanaka & Yamauchi, 2000; Urdan, 2004), although null findings are also present in the literature (Lee, Sheldon, & Turban, 2003; Pajares & Valiante, 2001). Performance-avoidance goals, on the other hand, are typically negative predictors of performance (Church, Elliot, & Gable, 2001; Elliot & McGregor, 2001; Finney, Pieper, & Barron, 2004; Vansteenkiste et al., 2004; Wolters, 2004), although some null results have also been found (Sideridis, 2005b; Tanaka & Yamauchi, 2001). These patterns for performance-approach and performance-avoidance goals often appear in zero-order correlations but are typically strongest in analyses in which achievement goals are entered as simultaneous predictors.

The predictive pattern for mastery goals appears to vary as a function of the type of analysis used. Mastery goals are often positive predictors of performance when zero-order correlations are considered (Elliot, McGregor, & Gable, 1999; Linnenbrink, 2005; Shih, 2005; Silver, Dwyer, & Alford, 2006; Tanaka et al., 2006), although some null results have been observed (Brett & VandeWalle, 1999; Senko & Harackiewicz, 2005). However, mastery goals are often unrelated (or less strongly related) to performance when all goals are examined together as simultaneous predictors (Cury, Elliot, Da Fonseca, & Moller, 2006; Elliot & Church, 2003; Malka & Covington, 2005; Sullivan, Worth, Baldwin, & Rothman, 2006; Zusho et al., 2005), although in some studies, mastery goals remain positive predictors of performance in simultaneous analyses (Church et al., 2001; Klein, Noe, & Wang, 2006; Porath & Bateman, 2006; Sideridis, 2007). In addition to the type of analysis conducted, the predictive utility of mastery goals seems to vary to some degree as a function of type of task and age of participant. Mastery goals appear more likely to be a positive predictor of conceptual learning and performance, as opposed to rote learning and performance, and these goals seem slightly more facilitative of performance for younger students, relative to university undergraduates.

In summary, relations between achievement goals and performance attainment have been somewhat consistent across studies, and discernable patterns may be ascertained. Performance-approach goals are often positive predictors, performance-avoidance goals are typically negative predictors, and mastery goals are sometimes positive predictors and are sometimes unre-

lated, perhaps depending on type of task, age of participants, and type of analysis conducted.

Emotions and Academic Performance

Two lines of evidence suggest that students' emotions influence their academic performance. First, experimental mood research has shown that affective states influence motivational and cognitive processes that are relevant to cognitive performance. Specifically, it has been shown that moods and emotions facilitate mood-congruent memory processes (Olafson & Ferraro, 2001), suggesting that positive affective states can enhance motivation to approach tasks, whereas negative affective states can enhance mood-congruent avoidance motivation. Furthermore, the findings indicate that positive affective states promote creative, flexible, and holistic ways of thinking, whereas negative affective states prompt more analytical, detailed, and rigid ways of processing information (Ashby, Isen, & Turken, 1999; Fiedler, 2001).

Second, studies directly analyzing students' emotions in classroom situations corroborate the importance of emotions for academic performance. As with research on goal–emotion links, however, most of these studies have focused on test anxiety (Zeidner, 2007). The evidence indicates that anxiety impairs performance on complex or difficult tasks that demand cognitive resources, and correlates negatively with achievement across age groups and academic domains (Hembree, 1988). The little longitudinal evidence that is available indicates that anxiety indeed exerts a negative impact on students' achievement (Meece, Wigfield, & Eccles, 1990; Pekrun, 1992a).

The evidence for links between achievement emotions other than anxiety and performance is quite limited. For enjoyment of learning, positive correlations with performance have been observed (Frenzel, Thrash, Pekrun, & Goetz, 2007; Goetz, Frenzel, Pekrun, Hall, & Lüdtke, 2007; Helmke, 1993; Larson, Hecker, & Norem, 1985; Pekrun et al., 2002a, 2002b), whereas relations for general positive affect have been inconsistent (Linnenbrink, 2007). For anger, shame, and general negative affect, negative correlations with performance have been found (Boekaerts, 1993; Linnenbrink et al., 1999; Pekrun et al., 2002a; Pekrun, Goetz, Perry, Kramer, & Hochstadt, 2004), although not in all instances (Linnenbrink, 2007; J. E. Turner & Schallert, 2001). For boredom and hopelessness, the findings suggest that the relation between these emotions and performance is negative (Pekrun et al., 2002a).

In summary, there is limited research, at present, on the link between achievement emotions and academic performance. The vast majority of empirical work has demonstrated that anxiety is a negative predictor of performance. A small number of additional studies have focused on other achievement emotions, and have found that enjoyment of learning tends to be a positive predictor of performance, whereas anger, shame, boredom, and hopelessness tend to be negative predictors. More research is clearly needed on the relation between discrete emotions (other than anxiety) and performance attainment.

Joint Influence of Achievement Goals and Emotions on Academic Performance

Only a few studies have examined the joint influence of achievement-related goals and emotions on academic perfor-

mance. In a cross-sectional study with middle school students, Roeser et al. (1996) found that mastery goals positively predicted performance, whereas general positive affect experienced at school did not. In an experimental study with undergraduates, Linnenbrink et al. (1999) found that performance-approach goals undermined performance on a memory task, as did negative affect related to the task, and that negative affect accounted for a portion of the goal effect. In two field studies with undergraduates, Elliot and McGregor (1999) demonstrated that performance-avoidance goals and test anxiety were both negative predictors of exam performance, and that test anxiety partially mediated the inimical influence of performance-avoidance goals on performance. Tanaka et al. (2006) reported a similar set of findings with undergraduates performing a presentation task.

In summary, these findings provide preliminary evidence suggesting that specific achievement emotions can mediate the link between achievement goals and performance. However, the literature is clearly at a nascent stage of development, and, most importantly, the mediational role of achievement emotions other than test anxiety has received no empirical attention.

Theoretical Framework: A Mediational Model Linking Achievement Goals, Achievement Emotions, and Academic Performance

In our previous research (Pekrun et al., 2006), we offered a theoretical model positing specific links between achievement goals and discrete achievement emotions. Here, we seek to extend this model to include the influence of goals and emotions on performance attainment. The emotions that we focus on are those experienced by students across diverse academic settings (Pekrun, 1992b; Pekrun et al., 2002a). Although we acknowledge that performance can influence students' emotions and goals, thus implying reciprocal effects of goals, emotions, and performance (see Elliot, 1997; Pekrun, 1992a, 2006), the present model focuses on the effects of goals on emotions, and of both goals and emotions on performance. We first provide a brief overview of the initial model and then describe the proposed extensions (see Figure 1).

Initial Model of Achievement Goals and Emotions

In our initial model, goals are presumed to facilitate different kinds of appraisals pertaining to achievement activities and their outcomes, these appraisals are thought to induce different kinds of discrete emotions, and goals are viewed as influencing emotions by shaping appraisals. Two kinds of appraisals are assumed to be critical for achievement emotions: (a) the perceived controllability of achievement activities and their outcomes and (b) the subjective value of these activities and outcomes (Pekrun, 2006; Pekrun, Frenzel, Goetz, & Perry, 2007). Specifically, it is posited that perceived controllability and the positive subjective value of achievement *activities* produce positive activity emotions (enjoyment) and reduce negative activity emotions (boredom and anger). Controllability of achievement *outcomes* and the positive subjective value of these outcomes are posited to foster positive outcome emotions (hope and pride). Lack of controllability and the negative subjective value of outcomes are posited to produce negative outcome emotions (anxiety, hopelessness, and shame).
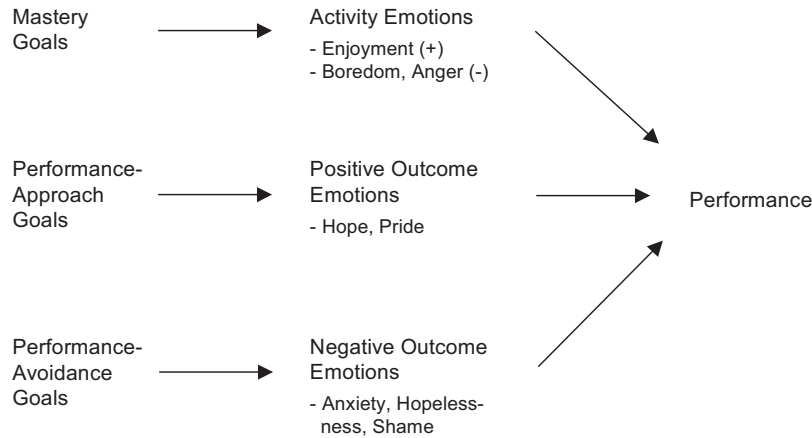
Figure 1.   The proposed theoretical integration for achievement goals, achievement emotions, and academic performance.

Achievement goals are thought to direct the attentional focus of students as they frame the control and value appraisals underlying achievement emotions, thereby influencing these emotions. Specifically, mastery goals are viewed as focusing attention on ongoing mastery of the activity and the positive value of the activity itself. Therefore, mastery goals are expected to facilitate positive activity emotions and to inhibit negative activity emotions. In contrast, performance goals are viewed as focusing attention on the outcome of achievement activities. Performance-approach goals are thought to focus attention on the perceived controllability and positive value of outcomes, implying that they should facilitate positive outcome emotions. Performance-avoidance goals are thought to focus attention on the perceived uncontrollability and negative value of negative outcomes, suggesting that they should evoke negative outcome emotions.

Extending the Model: I. The Link Between Emotions and Academic Performance

As argued in Pekrun's (2006) control–value theory, emotions can affect students' academic performance by influencing their motivation and effort, their use of learning strategies and self-regulation, and the availability of cognitive resources needed for learning and performance. More specifically, positive emotions such as enjoyment, hope, and pride likely have a positive influence on motivation, use of flexible learning strategies and self-regulation, and the availability of cognitive resources for task engagement. Thus, these emotions are expected to be positive predictors of performance attainment. Activating negative emotions such as anger, anxiety, and shame are thought to reduce cognitive resources and the use of flexible strategies and self-regulation. The motivational effects of these emotions are thought to be more complex, because they reduce intrinsic motivation, but can also evoke motivation to invest effort to avoid failure. Nevertheless, the overall influence of these emotions on performance is likely to be negative, as suggested by the available evidence (Hembree, 1988; Zeidner, 2007). Finally, deactivating negative emotions such as boredom and hopelessness are expected to uniformly impair motivation, the use of learning strategies, self-regulation, and the

availability of cognitive resources, suggesting that these emotions have a negative influence on academic performance.

Extending the Model: II. The Mediational Role of Emotions in the Relation Between Achievement Goals and Performance

Both achievement goals and achievement emotions are posited to influence academic performance, but the role of these two constructs is presumed to differ. Achievement goals are cognitive representations of possible outcomes that evoke psychological processes, including achievement emotions. Achievement emotions are experienced during task preparation and task engagement and, therefore, are integrally linked to achievement-related outcomes, including performance attainment. As such, achievement goals are posited to have a distal influence on performance, whereas achievement emotions are posited to have a more direct, proximal influence on performance. Indeed, achievement emotions are viewed as mediators that explain *how* achievement goals influence performance attainment.

Some methodologists have argued that mediation is applicable only when the relation between an independent variable and a dependent variable is significant (Baron & Kenny, 1986). However, the most common position in the contemporary literature is that mediation can occur even with a weak overall relation that does not attain statistical significance (Collins, Graham, & Flaherty, 1998; MacKinnon, Fairchild, & Fritz, 2007; Shrout & Bolger, 2002). In other words, the core requirements for mediation are that an independent variable predicts a mediator variable and that the mediator variable, in turn, predicts a dependent variable; a significant relation between the independent variable and the dependent variable is not necessary for mediation to occur. It is this approach to mediation that we adopt herein.

As noted earlier, the existing data indicate that performance-approach and performance-avoidance goals are significant positive and significant negative predictors of performance attainment, respectively, whereas mastery goals show a positive, but often nonsignificant, trend in predicting performance. In our research,

we considered the indirect, mediational influence of achievement goals on performance through achievement emotions for all three achievement goal variables (see Figure 1). Mastery goals are hypothesized to be positive predictors of the positive activity emotion enjoyment, which is in turn expected to be a positive predictor of performance; mastery goals are also hypothesized to be negative predictors of the negative activity emotions boredom and anger, and these emotions are in turn expected to negatively predict performance. The indirect influence of mastery goals on performance through each of these emotions is expected to be significant, indicating mediation. Performance-approach goals are hypothesized to be positive predictors of the positive outcome emotions hope and pride, and these emotions are in turn expected to be positive predictors of performance. The indirect influence of performance-approach goals on performance through these emotions is expected to be significant, indicating mediation. Performance-avoidance goals are hypothesized to be positive predictors of the negative outcome emotions anxiety, hopelessness, and shame, and these emotions are in turn expected to be negative predictors of performance. The indirect influence of performance-avoidance goals on performance through these emotions is expected to be significant, indicating mediation. In all instances, mediation is expected to be partial rather than complete, because other mediational processes, such as task absorption, self-handicapping, and study strategies (see Elliot & Church, 2003; Elliot et al., 1999), are likely to be operative as well.

Our extended model is consistent with Linnenbrink and Pintrich's (2002) bidirectional model of achievement goals and affect (as well as with proposals offered by Elliot & McGregor, 1999; Linnenbrink, 2007; and J. C. Turner et al., 1998). These models are grounded in conceptual approaches that are complementary rather than contradictory or mutually exclusive (control-process theory for Linnenbrink & Pintrich's, 2002, model and appraisal theory for Pekrun et al.'s, 2006, model), and both models share the proposition that mastery-approach goals promote positive emotions during task engagement. However, there are some important differences between the two models. Specifically, Linnenbrink and Pintrich's model predicts that performance-based goals promote negative emotions in most students. Students pursuing performance-approach goals are expected to focus on the unattainability of these goals, therefore often experiencing sadness, anxiety, and anger; the pursuit of performance-avoidance goals is also expected to often lead to anxiety. In contrast, in our model, we predict that performance-approach goals and performance-avoidance goals promote differential foci on positive versus negative outcomes, respectively, thus yielding emotions of different valence (hope and pride vs. anxiety, hopelessness, and shame, respectively).

Overview of Research and Hypotheses

We tested the proposed model in a prospective study with undergraduates enrolled in an introductory-level psychology course. In contrast to our previous research (Pekrun et al., 2006), goals and emotions were operationalized in a situationally specific fashion in this study. That is, both goals and emotions were assessed with regard to an important midterm exam, and their joint influence on exam performance was analyzed. To test achievement goals as predictors of emotions and emotions as predictors of exam performance, exam-based goals were assessed 1 week prior to the exam, and exam-based

emotions were assessed 1 day before the exam; thus, there was clear temporal separation of the goal, emotion, and performance constructs. Assessment of goals and emotions in the context of preparing for an exam implies that students' current goals and their state emotions were measured rather than more general goal orientations and trait emotions. The instructions used to assess emotions focused students' attention on emotions in a domain-specific way (i.e., relating to introductory-level psychology), in line with recent research on the domain specificity of student emotions (Goetz et al., 2007).

To ensure that any observed relations were not mere artifacts of other plausible variables, we assessed and controlled for the following in our analyses: gender, social desirability, positive and negative trait affectivity, and scholastic ability. Social desirability was assessed to control for the influence of common method variance which may be produced by self-report response sets. Trait affectivity and scholastic ability were assessed to minimize the likelihood that the predictive influence of goals on emotions, and of both goals and emotions on performance, were a mere epiphenomenon of these plausible third variables. The primary hypotheses examined in our study were as follows:

> *Hypothesis 1:* Mastery goals positively predict enjoyment and negatively predict boredom and anger; performance-approach goals positively predict hope and pride; performance-avoidance goals positively predict anxiety, hopelessness, and shame.

> *Hypothesis 2:* Mastery goals either positively predict performance or, more likely with this population and for this task, exhibit a positive trend in predicting performance; performance-approach goals positively predict performance; performance-avoidance goals negatively predict performance.

> *Hypothesis 3:* Enjoyment, hope, and pride positively predict performance; anger, boredom, anxiety, hopelessness, and shame negatively predict performance.

> *Hypothesis 4:* The focal emotions mediate the link between achievement goals and performance attainment.

Method

Participants and Procedure

Participants were 218 undergraduates (147 female and 71 male) in a psychology course (social–personality psychology) who took part in the study in return for extra course credit (age: $M = 19.43$, $SD = 1.76$ years).[2] The class was conducted in lecture format, and evaluation was based on a normative grading structure. Participants completed the measures in five different assessments. Positive and negative affectivity were assessed in a large group session on the first day of the semester. Social desirability was assessed in a take-home packet that was completed 6 days later. Achievement goals for the midterm exam were assessed in a large group session 1 week prior to the exam. Achievement emotions

---

[2] Two individuals were not included in the data set because they were part of a learning assistance services program at the university. These individuals had been diagnosed with a learning disability and took the exam under special circumstances (e.g., they had the exam read to them or had someone write down their responses).

were assessed in a take-home packet that was completed 6 days later (1 day before the exam). Participants completed that exam in a large group session. Exam performance data were obtained from the professor of the course at the end of the semester, and scholastic ability data were obtained from the university register at the end of the semester as well. This prospective design provided clear temporal separation of all measures in the study. For all assessments, participants were assured that their responses would remain confidential and would in no way influence their course grade.

Measures

Achievement goals. Participants' exam-specific achievement goals were assessed with a slightly revised version of the Achievement Goals Questionnaire used by Pekrun et al. (2006). The revisions to the items were as follows: (a) A uniform stem was used for each item ("I will be trying to . . ."), (b) the performance-approach item that referred to grades was replaced with "I will be trying to perform better than others on the exam," and (c) the performance-avoidance item "My goal is to not perform poorly relative to my classmates" was replaced with "I will be trying to avoid performing worse than other students on the exam" so that one item in this scale did not contain the word "poorly." Each achievement goal was assessed with three items, and participants responded to the items on a scale from 1 (*not at all true of me*) to 7 (*very true of me*). Participants' scores were summed to create the three goal indexes (mastery goal $\alpha = .89$, performance-approach goal $\alpha = .95$, performance-avoidance goal $\alpha = .96$).

Achievement emotions. The learning-related emotion scales of the Achievement Emotions Questionnaire (Pekrun et al., 2002a; Pekrun, Goetz, & Perry, 2005) were used to assess participants' emotions prior to the exam. These scales address both activity-related emotions and outcome-related emotions. The instructions for the measure asked respondents to describe how they felt about preparing for the exam. More specifically, the measure uses a situation-reaction questionnaire format providing a description of the exam-related situation the assessment refers to and then asking respondents to report how they felt in the situation. The scales assess eight different emotions: enjoyment (9 items; e.g., "I enjoy dealing with the exam material"), hope (5 items; e.g., "I feel confident when studying"), pride (8 items; e.g., "I'm proud of myself"), boredom (11 items; e.g., "Studying for the exam bores me"), anger (10 items; e.g., "I get angry while studying"), anxiety (11 items; e.g., "I get tense and nervous while studying"), hopelessness (10 items; e.g., "I feel hopeless when I think about studying"), and shame (11 items; e.g., "I feel ashamed"). Participants responded on a 1 (*not at all*) to 5 (*very much*) scale, and the scores were summed to form the emotion indexes (enjoyment $\alpha = .83$, hope $\alpha = .85$, pride $\alpha = .85$, boredom $\alpha = .85$, anger $\alpha = .88$, anxiety $\alpha = .88$, hopelessness $\alpha = .93$, shame $\alpha = .90$).

Social desirability.[3] Paulhus's (1991) Balanced Inventory of Desirable Responding was used to assess social desirability. This inventory consists of two 20-item subscales: Impression Management and Self-Deceptive Enhancement. Half of the items for each subscale represent desirable statements, and half represent undesirable statements. Participants respond to each item, using a 1 (*not true*) to 7 (*very true*) scale, and after reverse scoring the undesirable statements, participants receive one point for each extreme (6

or 7) response. Participants' scores for each subscale were summed to form the Impression Management ($\alpha = .66$) and Self-Deceptive Enhancement ($\alpha = .74$) indexes.

Positive and negative trait affectivity. Clark and Watson's (1995) Brief Temperament Survey was used to assess positive and negative trait affectivity. The Positive Affectivity scale comprised 13 items (e.g., "In my life, interesting and exciting things happen every day"), and the Negative Affectivity scale comprised 14 items (e.g., "Sometimes I feel edgy all day"). Participants responded 1 (*true*) or 0 (*false*), and scores were summed to create the Positive Affectivity ($\alpha = .81$) and Negative Affectivity ($\alpha = .85$) indexes.

Exam performance. Participants' score on their midterm exam was used as a measure of performance attainment.

Scholastic ability. Scores from the Verbal subscale of the Scholastic Aptitude Test were used as an index of scholastic ability.

Results

Preliminary Analysis, Descriptive Statistics, and Intercorrelations

Prior to the primary analyses, a confirmatory factor analysis was conducted to document that the revised Achievement Goals Questionnaire retained the same structural properties as the original scale (i.e., three factors: Mastery Goals, Performance-Approach Goals, and Performance-Avoidance Goals). The analysis was conducted with AMOS 5 (Arbuckle, 2003); covariance matrices served as input, and solutions were generated on the basis of maximum-likelihood estimation. Following Hoyle and Panter's (1995) recommendation, both absolute and incremental fit indexes were used to evaluate model fit. The results confirmed that the hypothesized three-factor solution had a good fit to the data, $\chi^2(24, N = 218) = 44.13$, $p < .01$; χ^2/df ratio $= 1.84$; comparative fit index $= .99$; Tucker–Lewis index $= .99$; root mean square error of approximation $= .062$. All factor loadings were significant, and the average factor loading was .91. This three-factor model fit significantly better than a two-factor model comprising Mastery Goals and Omnibus Performance Goals (Performance-Approach and Performance-Avoidance Goals collapsed together), $\Delta\chi^2(2) = 335.81$, $p < .001$.

Table 1 displays the descriptive statistics for each of the variables in the study. Table 2 presents the Pearson product–moment correlations among these same variables.

Achievement Goals as Predictors of Achievement Emotions

Simultaneous multiple regression analyses were conducted to examine the predictive relations between the achievement goal and achievement emotion variables, with separate analyses for the different emotions. The influence of gender was examined in preliminary analyses. Gender was not a significant predictor of any of the emotions. Furthermore, when entering Gender × Goal interaction terms into the regression equations, none of the Gender × Goal interactions were significant predictors for any

---

[3] The social desirability data were collected in the context of a larger project and were also used in a study by Murayama and Elliot (in press). None of the analyses or findings reported in the text have been reported in prior work.

Table 1
Descriptive Statistics for the Study Variables

Variable	M	SD	Possible range	Observed range
Mastery goals	17.10	3.19	3–21	5–21
Performance-approach goals	15.28	4.78	3–21	3–21
Performance-avoidance goals	14.50	4.86	3–21	3–21
Enjoyment	26.08	6.24	9–45	11–43
Boredom	25.99	9.17	11–55	11–51
Anger	23.60	7.61	10–50	10–50
Hope	16.19	3.92	5–25	5–25
Pride	25.65	6.25	8–40	8–40
Anxiety	27.84	8.97	11–55	11–53
Hopelessness	18.74	7.86	10–55	10–50
Shame	23.02	8.94	11–55	11–55
Exam performance	78.72	14.66	0–100	10–100
Self-deception	5.05	3.01	0–20	0–16
Impression management	5.87	3.48	0–20	0–20
Positive affectivity	5.61	2.46	0–13	0–9
Negative affectivity	4.72	2.95	0–14	0–10
Scholastic ability	630.26	75.21	0–800	370–800

of the emotions. Therefore, gender was not included in the final analyses. Table 3 presents a summary of the results from the final analyses.

The enjoyment regression revealed that mastery goals were a positive predictor of enjoyment, $F(1, 214) = 52.42$, $p < .001$ ($\beta = .44$). The boredom regression showed that mastery goals were a negative predictor of boredom, $F(1, 214) = 50.54$, $p < .001$ ($\beta = -.43$). In the anger regression, mastery goals were a negative predictor of anger, $F(1, 214) = 10.93$, $p < .01$ ($\beta = -.22$), whereas performance-avoidance goals were a positive predictor, $F(1, 214) = 4.62$, $p < .05$ ($\beta = .21$). No other relations were significant for any of the activity emotions.

The hope regression showed that mastery goals were a positive predictor of hope, $F(1, 214) = 43.64$, $p < .001$ ($\beta = .40$). In addition, although the bivariate relation between performance-based goals and hope was not significant ($r = .05$ and $-.11$ for performance-approach and performance-avoidance goals, respectively; see Table 2), in multiple regression controlling the other goals, performance-approach goals were a positive predictor of hope, $F(1, 214) = 9.36$, $p < .01$ ($\beta = .28$), whereas performance-avoidance goals were a negative predictor, $F(1, 214) = 14.37$, $p < .001$ ($\beta = -.35$). In the pride regression, mastery and performance-approach goals were positive predictors of pride, $F(1, 214) = 26.50$, $p < .001$ ($\beta = .32$), and $F(1, 214) = 21.60$, $p < .001$ ($\beta = .44$), respectively. In addition, although the bivariate relation between performance-avoidance goals and pride was not significant ($r = .07$), performance-avoidance goals were a negative predictor of pride when controlling the other goals, $F(1, 214) = 8.66$, $p < .01$ ($\beta = -.28$).

The anxiety regression revealed that performance-avoidance goals were a positive predictor of anxiety, $F(1, 214) = 8.38$, $p < .01$ ($\beta = .29$). In the hopelessness regression, mastery goals were a negative predictor of hopelessness, $F(1, 214) = 15.87$, $p < .001$ ($\beta = -.26$). In addition, although the bivariate relation between performance-avoidance goals and hopelessness was not significant ($r = .12$), performance-avoidance goals were a positive

predictor of hopelessness when controlling the other goals, $F(1, 214) = 6.86$, $p < .01$ ($\beta = .27$). The shame regression showed that mastery goals were a (weak) negative predictor of shame, $F(1, 214) = 5.03$, $p < .05$ ($\beta = -.15$), whereas performance-avoidance goals were a positive predictor, $F(1, 214) = 8.38$, $p < .05$ ($\beta = .29$). No other relations were significant for any of the outcome emotions.

Achievement goals as predictors of achievement emotions controlling social desirability. We then repeated the initial analyses with the social desirability variables included in the model. The Pearson product–moment correlations (see Table 2) indicated that self-deception was significantly correlated with all eight of the emotion variables and that impression management was correlated with six of the eight emotion variables. Thus, it is possible that the observed relations were due to the influence of social desirability. The analyses documented the robustness of the observed relations across social desirability (see Table 4). All but one of the significant relations reported in the initial analyses remained significant with social desirability controlled (mastery goals were no longer a significant negative predictor of shame), and the magnitude of the coefficients remained essentially the same.

Achievement goals as predictors of achievement emotions controlling trait affectivity. Next, we repeated the initial analyses with the positive and negative trait affectivity variables included in the model. The Pearson product–moment correlations (see Table 2) indicated that the trait affectivity variables were significantly (or, in one instance, nearly significantly) correlated with each of the eight like-valenced emotion variables. Thus, it is possible that the observed relations were due to the influence of trait affectivity. The analyses documented the robustness of the observed relations across trait affectivity (see Table 4). Each of the significant relations reported in the initial analyses remained significant (or, in one instance, nearly significant) with trait affectivity controlled, and the magnitude of the coefficients remained essentially the same.

Achievement goals as predictors of achievement emotions controlling scholastic ability. Next, we repeated the initial analyses with scholastic ability included in the model. The Pearson

Table 2
Pearson Product–Moment Correlations for the Study Variables

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1. Mastery goals	—																	
2. Performance-approach goals	.10	—																
3. Performance-avoidance goals	.06	.75**	—															
4. Enjoyment	.42**	-.10	-.11	—														
5. Boredom	-.40**	.18**	.21**	-.49**	—													
6. Anger	-.20**	.15	.21**	-.30**	.66**	—												
7. Hope	.40**	.05	-.11	.63**	-.35**	-.46**	—											
8. Pride	.34**	.26**	.07	.57**	-.22**	-.19**	.74**	—										
9. Anxiety	-.07	.12	.22**	-.07	.34**	.73**	-.43**	-.16*	—									
10. Hopelessness	-.25**	.01	.12	-.24**	.53**	.73**	-.56**	-.36**	.75**	—								
11. Shame	-.14*	.10	.20**	-.07	.40**	.69**	-.38**	-.20**	.77**	.79**	—							
12. Exam performance	.13*	.22**	.06	.08	-.13*	-.28**	.30**	.35**	-.25**	-.41**	-.43**	—						
13. Self-deception	.12	-.07	-.10	.16*	-.31**	-.29**	.21**	.19**	-.27**	-.24**	-.21**	-.01	—					
14. Impression management	.10	-.16*	-.07	.13	-.32**	-.34**	.13	.04	-.27**	-.33**	-.34**	.17*	.27**	—				
15. Positive affectivity	.15*	.00	-.08	.29**	-.21**	-.01	.12	.30**	.07	.00	-.01	.07	.25**	-.02	—			
16. Negative affectivity	.11	.20**	.21**	-.04	.20**	.36**	-.04	.00	.38**	.24**	.26**	-.04	-.29**	-.07	-.15*	—		
17. Scholastic ability	-.03	.03	-.04	.01	.03	-.12	.05	-.01	-.10	-.14*	-.14	.16*	.02	.02	-.02	.06	—	
18. Gender	.12	.07	.11	-.06	-.01	.03	-.07	-.04	.00	-.07	-.09	.08	-.17**	.03	.10	.25**	-.10	—

* $p < .05$. ** $p < .01$.

product–moment correlations (see Table 2) indicated that scholastic ability was significantly correlated with two of the eight emotion variables. Thus, it is conceivable that at least some of the observed relations were due to the influence of scholastic ability. The analyses demonstrated the robustness of the observed relations across scholastic ability (see Table 4). All but one of the significant relations reported in the initial analyses remained significant with scholastic ability controlled (mastery goals were no longer a significant negative predictor of shame), and the magnitude of the coefficients remained essentially the same.[4]

Achievement Goals and Achievement Emotions as Predictors of Exam Performance

Two sets of analyses were used to test the influence of achievement goals and achievement emotions on exam performance. The influence of gender was examined in preliminary analyses. Gender was not a significant predictor of performance. Furthermore, when entering Gender × Goal interaction terms into the regression equations, none of the Gender × Goal interactions were significant predictors for performance in any of the regression analyses. Therefore, gender was not included in the final analyses. First, a simultaneous multiple regression analysis was conducted to examine the predictive relationships between the achievement goal variables and exam performance (Table 5). Performance-approach goals were a positive predictor of performance, $F(1, 214) = 14.15$, $p < .001$ ($\beta = .38$), in line with the significant bivariate relation between these variables ($r = .22$, $p < .01$; Table 2). Although the bivariate relation between performance-avoidance goals and performance was not significant ($r = .06$), performance-avoidance goals were a negative predictor of performance in multiple regression controlling the other goals, $F(1, 214) = 5.03$, $p < .05$ ($\beta = -.23$). The relationship between mastery goals and performance was not significant, but a positive trend was observed, $F(1, 214) = 3.02$, $p = .08$ ($\beta = .11$), in line with the significant bivariate relation between mastery goals and performance ($r = .13$, $p < .05$).

Second, simultaneous multiple regression analyses were conducted to examine achievement goals and achievement emotions as joint predictors of exam performance. Analyses were conducted separately for the different emotions (Table 5). The indirect influence of achievement goals on performance through the emotion variables was assessed, using MacKinnon, Lockwood, Hoffman, West, and Sheets's (2002) z' test. We also calculated the extent to which the influence of achievement goals on performance was reduced when including the emotion variable in the regression equation. The reduction of the direct goal effect is equivalent to the proportion of the overall goal effect mediated by emotion, and

---

[4] In these control variable analyses, a few relations that were initially not significant became significant. In the social desirability analyses, performance-approach goals became a significant negative predictor of hopelessness and shame, and performance-avoidance goals became a significant positive predictor of boredom. In the trait affectivity analyses, mastery goals became a significant negative predictor of anxiety, and performance-approach goals became a significant negative predictor of hopelessness. In the scholastic ability analyses, performance-avoidance goals became a significant positive predictor of boredom.

Table 3
Simultaneous Multiple Regression Analyses for Achievement Goals as Predictors of Achievement Emotions

Predictor variable	Enjoyment	Boredom	Anger	Hope	Pride	Anxiety	Hopelessness	Shame
Mastery goals	.44**	−.43**	−.22*	.40**	.32**	−.08	−.26**	−.15*
Performance-approach goals	−.11	.12	.02	.28**	.44**	−.09	−.16	−.10
Performance-avoidance goals	−.06	.15	.21**	−.35**	−.28**	.29**	.27**	.29**

Note. The tabled values are standardized coefficients from simultaneous regression analyses.
* $p < .05$. ** $p < .01$.

serves as an indicator of effect size for mediation (MacKinnon et al., 2007).

In the enjoyment regression, performance-approach goals remained a positive predictor of exam performance, $F(1, 213) = 14.59$, $p < .001$ ($\beta = .39$), and performance-avoidance goals remained a negative predictor $F(1, 213) = 4.84$, $p < .05$ ($\beta = −.22$). Enjoyment was not a significant predictor of performance; as such, mediation through enjoyment was not present (see Figure 2).

In the boredom regression, performance-approach goals remained a positive predictor of exam performance, $F(1, 213) = 15.51$, $p < .001$ ($\beta = .40$), and performance-avoidance goals remained a negative predictor, $F(1, 213) = 4.11$, $p < .05$ ($\beta = −.20$). Boredom was a nearly significant negative predictor of performance, $F(1, 213) = 3.71$, $p = .055$ ($\beta = −.14$), and as documented earlier, mastery goals were a significant negative predictor of boredom. Thus, mediation was possible (albeit a weak form of mediation, given that the relation between boredom and performance was not quite significant). The z' test confirmed the presence of mediation through boredom for mastery goals, $z' = 1.87, p < .01$. Mastery goals were a negative predictor of boredom, boredom was a negative predictor of performance, and the trend for mastery goals predicting performance was reduced 54.6% (from $\beta = .11$ to .05) and was no longer close to significance with boredom in the equation (see Figure 2).

The anger regression revealed that performance-approach goals remained a positive predictor of exam performance, $F(1, 213) = 15.90$, $p < .001$ ($\beta = .38$). Anger was a negative predictor of performance, $F(1, 213) = 20.38$, $p < .001$ ($\beta = −.30$), and, as documented earlier, mastery and performance-avoidance goals were significant predictors of anger. Thus, mediation was possible. The z' test confirmed the presence of mediation through anger for performance-avoidance goals, $z' =$

2.15, $p < .01$. Performance-avoidance goals were a positive predictor of anger, anger was a negative predictor of performance, and the direct influence of performance-avoidance goals on performance was reduced 30.4% (from $\beta = −.23$ to −.16) and was no longer significant with anger in the equation. The z' test also confirmed the presence of mediation through anger for mastery goals, $z' = 2.67$, $p < .01$. Mastery goals were a negative predictor of anger, anger was a negative predictor of performance, and the trend for mastery goals predicting performance was reduced 54.6% (from $\beta = .11$ to .05) and was no longer close to significance with anger in the equation (see Figure 2).

The hope regression showed that performance-approach goals remained a positive predictor of exam performance, $F(1, 213) = 9.15$, $p < .01$ ($\beta = .30$). Hope was also a positive predictor of performance, $F(1, 213) = 14.42$, $p < .001$ ($\beta = .27$), and, as documented earlier, all three achievement goals were significant predictors of hope. Thus, mediation was possible. The z' test confirmed the presence of mediation through hope for both performance-approach goals, $z' = 2.38$, $p < .01$, and performance-avoidance goals, $z' = 2.68$, $p < .01$. Performance-approach goals were a positive predictor of hope, hope was a positive predictor of performance, and the direct influence of performance-approach goals on performance was reduced 21.1% (from $\beta = .38$ to .30) with hope in the equation. Performance-avoidance goals, on the other hand, were a negative predictor of hope, hope was a positive predictor of performance, and the direct influence of performance-avoidance goals on performance was reduced 43.5% (from $\beta = −.23$ to −.13) and was no longer significant with hope in the equation. The z' test also confirmed the presence of mediation through hope for mastery goals, $z' = 3.29, p < .01$. Mastery goals were a positive

Table 4
Simultaneous Multiple Regression Analyses for Achievement Goals as Predictors of Achievement Emotions Controlling Social Desirability, Trait Affectivity, and Scholastic Ability

Predictor variable	Enjoyment	Boredom	Anger	Hope	Pride	Anxiety	Hopelessness	Shame
Mastery goals	.42**/.41**	−.37**/−.43**	−.15*/−.27**	.38**/.41**	.31**/.29**	−.03/−.15*	−.21*/−.31**	−.10/−.19**
	.46**	−.43**	−.20*	.42**	.34**	−.07	−.24**	−.12
Performance-approach goals	−.09/−.13	.04/.11	−.08/−.03	.30**/.29**	.43**/.42**	−.16/−.14	−.24*/−.19*	−.19*/−.14
	−.01	.06	.03	.35**	.53**	−.05	−.13	−.07
Performance-avoidance goals	−.07/−.02	.18*/.11	.26**/.18†	−.33**/−.34**	−.24*/−.23*	.31**/.27**	.28**/.24**	.32**/.27**
	−.13	.22*	.25**	−.42**	−.38**	.31**	.27**	.28**

Note. Values are standardized coefficients from simultaneous regression analyses. The upper left entry is the coefficient controlling for social desirability; the upper right entry is the coefficient controlling for trait affectivity; the lower entry is the coefficient controlling for scholastic ability.
* $p < .05$. ** $p < .01$. † $p < .10$.

Table 5
Simultaneous Multiple Regression Analyses for Achievement Goals and Achievement Emotions as Predictors of Exam Performance

Predictor variable	Analysis without emotion in the equation	Emotion included in the equation							
		Enjoyment	Boredom	Anger	Hope	Pride	Anxiety	Hopelessness	Shame
Mastery goals	.11[†]	.09	.05	.05	.01	.02	.09	.01	.05
Performance-approach goals	.38**	.39**	.40**	.38*	.30**	.25*	.36**	.32**	.33**
Performance-avoidance goals	−.23*	−.22*	−.20*	−.16	−.13	−.14	−.15	−.12	−.10
Emotion	—	−.07	−.14*	−.30**	.27**	.29**	−.26**	−.41**	−.44**

Note. Values are standardized coefficients from simultaneous regression analyses.
* $p \leq .05$. ** $p < .01$. † $p < .10$.

predictor of hope, hope was a positive predictor of performance, and the trend for mastery goals predicting performance was reduced 90.9% (from β = .11 to .01) and was no longer close to significance with hope in the equation (see Figure 3).

In the pride regression, performance-approach goals remained a positive predictor of exam performance, $F(1, 213)$ = 6.05, $p < .05$ (β = .25). Pride was also a positive predictor of performance, $F(1, 213)$ = 17.34, $p < .001$ (β = .29), and, as documented earlier, all three achievement goals were significant predictors of pride. Thus, mediation was possible. The z' test confirmed the presence of mediation through pride for both performance-approach goals, z' = 3.16, $p < .01$, and performance-avoidance goals, z' = 2.41, $p < .01$. Performance-approach goals were a positive predictor of pride, pride was a positive predictor of performance, and the direct influence of performance-approach goals on performance was reduced 34.2% (from β = .38 to .25) with pride in the equation. Performance-avoidance goals, on the other hand, were a negative predictor of pride, pride was a positive predictor of performance, and the direct influence of performance-avoidance
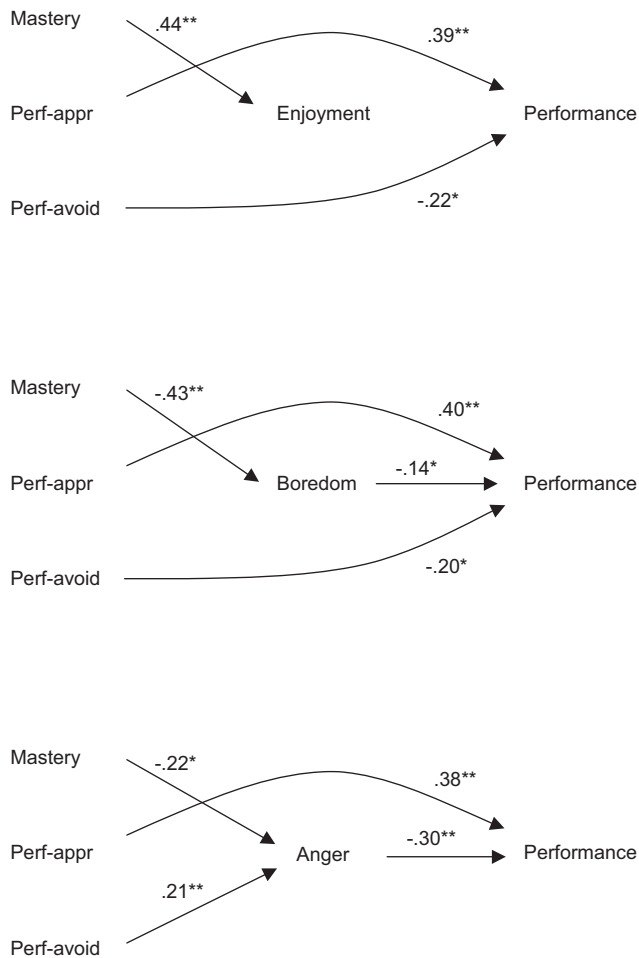
Figure 2. Summary of analyses for activity emotions. Only significant relations are displayed. Betas for mastery goals, performance-approach (perf-appr) goals, and performance-avoidance (perf-avoid) goals as predictors of performance not including emotion as a mediator were .11, .38, and −.23, respectively. * $p < .05$. ** $p < .01$.
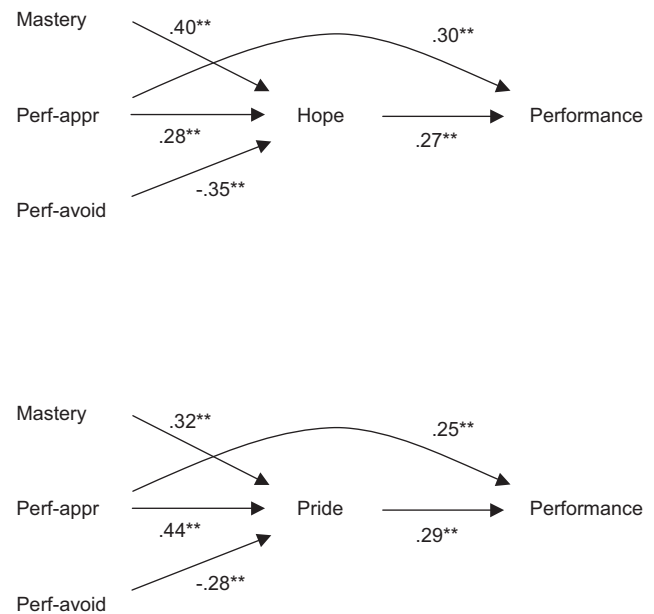
Figure 3. Summary of analyses for positive outcome emotions. Only significant relations are displayed. Betas for mastery goals, performance-approach (perf-appr) goals, and performance-avoidance (perf-avoid) goals as predictors of performance not including emotion as a mediator were .11, .38, and −.23, respectively. ** $p < .01$.

goals on performance was reduced 43.5% (from $\beta = -.23$ to $-.14$) and was no longer significant with pride in the equation. The z' test also confirmed the presence of mediation through pride for mastery goals, $z' = 3.23$, $p < .01$. Mastery goals were a positive predictor of pride, pride was a positive predictor of performance, and the trend for mastery goals predicting performance was reduced 81.8% (from $\beta = .11$ to .02) and was no longer close to significance with pride in the equation (see Figure 3).

The anxiety regression revealed that performance-approach goals remained a positive predictor of performance, $F(1, 213) = 13.34$, $p < .001$ ($\beta = .36$). Anxiety was a negative predictor of performance, $F(1, 213) = 16.14$, $p < .001$ ($\beta = -.26$), and, as documented earlier, performance-avoidance goals were a significant predictor of anxiety. Thus, mediation was possible. The z' test confirmed the presence of mediation through anxiety for performance-avoidance goals, $z' = 2.35$, $p < .01$. Performance-avoidance goals were a positive predictor of anxiety, anxiety was a negative predictor of performance, and the direct influence of performance-avoidance goals on performance was reduced 34.8% (from $\beta = -.23$ to $-.15$) and was no longer significant with anxiety in the equation (see Figure 4).

The hopelessness regression showed that performance-approach goals remained a positive predictor of exam performance, $F(1, 213) = 11.57$, $p < .001$ ($\beta = .32$). Hopelessness was a negative predictor of performance, $F(1, 213) = 40.91$, $p < .001$ ($\beta = -.41$), and, as documented earlier, mastery and performance-avoidance goals were significant predictors of hopelessness. Thus, mediation was possible. The z' test confirmed the presence of mediation through hopelessness for performance-avoidance goals, $z' = 2.42$, $p < .01$. Performance-avoidance goals were a positive predictor of hopelessness, hopelessness was a negative predictor of performance, and the direct influence of performance-avoidance goals on performance was reduced 47.8% (from $\beta = -.23$ to $-.12$) and was no longer significant with hopelessness in the equation. The z' test also confirmed the presence of mediation through hopelessness for mastery goals, $z' = 3.38$, $p < .01$. Mastery goals were a negative predictor of hopelessness, hopelessness was a negative predictor of performance, and the trend for mastery goals predicting performance was reduced 90.9% (from $\beta = .11$ to .01) and was no longer close to significance with hopelessness in the equation (see Figure 4).

Finally, in the shame regression, performance-approach goals remained a positive predictor of exam performance, $F(1, 213) = 13.50$, $p < .001$ ($\beta = .33$). Shame was a negative predictor $F(1, 213) = 52.66$, $p < .001$ ($\beta = -.44$), and, as documented earlier, mastery and performance-avoidance goals were significant predictors of shame. Thus, mediation was possible. The z' test confirmed the presence of mediation through shame for performance-avoidance goals, $z' = 2.64$, $p < .01$. Performance-avoidance goals were a positive predictor of shame, shame was a negative predictor of performance, and the direct influence of performance-avoidance goals on performance was reduced 56.5% (from $\beta = -.23$ to $-.10$) and was no longer significant with shame in the equation. The z' test also confirmed the presence of mediation through shame for mastery goals, $z' = 2.14$, $p < .01$. Mastery goals were a negative predictor of shame, shame was a negative predictor of perfor-
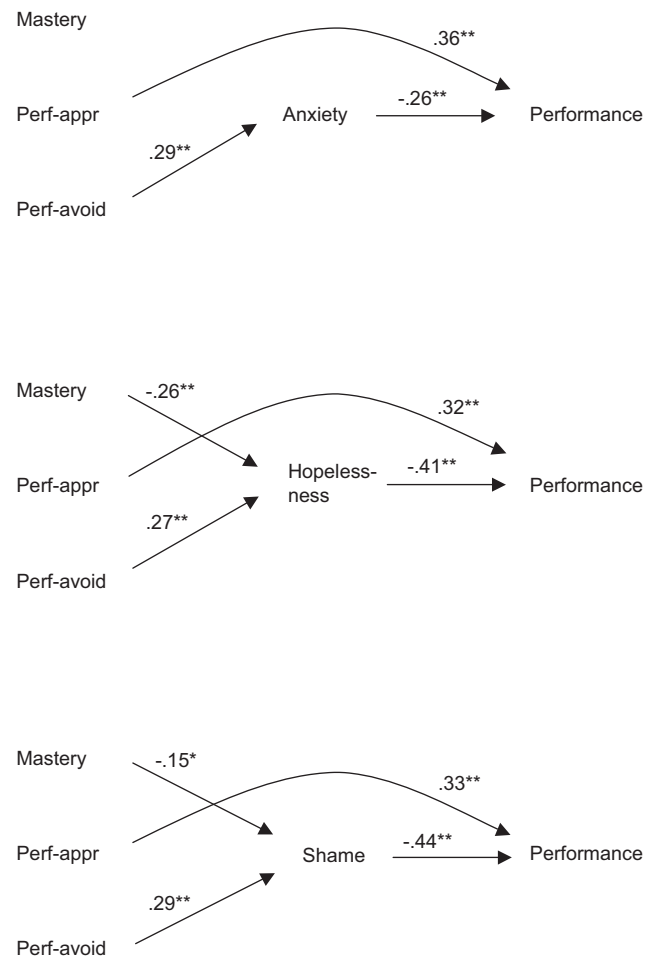

Figure 4. Summary of analyses for negative outcome emotions. Only significant relations are displayed. Betas for mastery goals, performance-approach (perf-appr) goals, and performance-avoidance (perf-avoid) goals as predictors of performance not including emotion as a mediator were .11, .38, and $-.23$, respectively. $^* p < .05$. $^{**} p < .01$.

mance, and the trend for mastery goals predicting performance was reduced 54.6% (from $\beta = .11$ to .05) and was no longer close to significance with hope in the equation (see Figure 4).

Achievement goals and achievement emotions as predictors of performance controlling social desirability. We then repeated the initial analyses with the social desirability variables included in the model. The Pearson product–moment correlations (see Table 2) indicated that impression management was significantly correlated with exam performance, but self-deception was not. Thus, it is possible that the observed relations were due to the influence of social desirability. The analyses demonstrated the robustness of the observed relations across social desirability. All of the significant relations reported in the initial analyses remained significant or showed no more than minimal change (Beta difference $\leq .01$) with social desirability controlled, with one exception (the nearly significant relation between boredom and performance was no longer nearly significant; see Table 6). The results from each of the z' tests

Table 6
Simultaneous Multiple Regression Analyses for Achievement Goals and Achievement Emotions as Predictors of Exam Performance Controlling Social Desirability, Trait Affectivity, and Scholastic Ability

Predictor variable	Analysis without emotion in the equation	Emotion included in the equation							
		Enjoyment	Boredom	Anger	Hope	Pride	Anxiety	Hopelessness	Shame
Mastery goals	.10/.12†	.07/.10	.06/.06	.06/.03	.00/.01	.01/.03	.09/.07	.02/−.01	.06/.03
	.11	.07	.05	.05	−.03	−.03	.09	.01	.06
Performance-approach goals	.43**/.38***	.44**/.39***	.44**/.40***	.41**/.37***	.36**/.31***	.31**/.26***	.40**/.34***	.34**/.30***	.35**/.32***
	.33***	.33***	.34**	.33***	.21*	.12	.32***	.28***	.30***
Performance-avoidance goals	−.25*/−.21*	−.25*/−.21*	−.23*/−.19	−.17/−.15	−.16/−.12	−.18/−.14	−.18/−.13	−.14/−.11	−.11/−.09
	−.22*	−.21*	−.19	−.16	−.08	−.07	−.15	−.12	−.11
Emotion	—	.07/.05	−.11/−.12	−.29**/−.31***	.26**/.27***	.30**/.30***	−.24**/−.29***	−.39**/−.42***	−.43**/−.45***
		.07	−.13	−.25***	.33***	.39***	−.21**	−.38***	−.39***

Note. Values are standardized coefficients from simultaneous regression analyses. The upper left entry is the coefficient controlling for social desirability; the upper right entry is the coefficient controlling for trait affectivity; the lower entry is the coefficient controlling for scholastic ability.
* $p < .05$. ** $p < .01$. *** $p < .001$. † $p < .10$.

remained significant and of comparable magnitude with social desirability controlled.

Achievement goals and achievement emotions as predictors of performance controlling trait affectivity. Next, we repeated the initial analyses with the positive and negative trait affectivity variables included in the model. The Pearson product–moment correlations (see Table 2) indicated that neither of the trait affectivity variables were significantly correlated with exam performance, but we conducted the analyses nonetheless. The analyses demonstrated the robustness of the observed relations across trait affectivity. All of the significant relations reported in the initial analyses remained significant, with one exception (the nearly significant relation between boredom and performance was now $p = .109$; see Table 6). With trait affectivity controlled, the results from each of the z' tests remained significant and of comparable magnitude.

Achievement goals and achievement emotions as predictors of performance controlling scholastic ability. Next, we repeated the initial analyses with scholastic ability included in the model. The Pearson product–moment correlations (see Table 2) indicated that scholastic ability was significantly correlated with exam performance. Thus, it is possible that the observed relations were due to the influence of scholastic ability. The analyses demonstrated the robustness of the observed relations across scholastic ability. All of the significant relations reported in the initial analyses remained significant or showed no more than minimal change (Beta difference ≤ .01) with scholastic ability controlled, with one exception (performance-approach goals were no longer significant predictors of performance in the pride analysis, meaning that mediation of this relation was even stronger; see Table 6). The results from each of the z' tests remained significant and of comparable magnitude with scholastic ability controlled.

Supplementary Analysis: Achievement Goals and the Four Categories of Achievement Emotions as Joint Predictors of Performance

To analyze the combined predictive effects of goals and different emotion variables within one regression model, we standardized each achievement emotion variable and summed the emotion variables within each of the four categories—positive activity, negative activity, positive outcome, and negative outcome. The emotion variables were combined within emotion categories to avoid including a large number of correlated emotion variables in a single analysis. Enjoyment was the sole representative of the positive activity emotions category; boredom and anger represented the negative activity emotions category; hope and pride represented the positive outcome emotions category; and anxiety, hopelessness, and shame represented the negative outcome emotions category. We conducted a simultaneous multiple regression analysis to examine the three achievement goals and the four achievement emotion categories as joint predictors of exam performance.

In the analysis, performance-approach goals remained a positive predictor of exam performance, $F(1, 210) = 5.42$, $p < .05$ ($\beta = .23$). Positive outcome emotions were also a positive predictor of performance, $F(1, 210) = 5.75$, $p < .05$ ($\beta = .24$), and negative outcome emotions were a negative predictor, $F(1, 210) = 12.48$,

$p < .001$ ($\beta = -.34$). The coefficients for the other predictors were not significant.[5] The z' test confirmed the presence of mediation through positive outcome emotions for performance-approach goals, $z' = 2.08$, $p < .01$, and the direct influence of performance-approach goals on performance was reduced 39.5% (from $\beta = .38$ to $.23$) with the emotion variables in the equation. The z' test also confirmed the presence of mediation through positive outcome emotions, $z' = 1.99$, $p < .01$, and negative outcome emotions, $z' = 2.19$, $p < .01$, for performance-avoidance goals, and the direct influence of performance-avoidance goals on performance was reduced 78.3% (from $\beta = -.23$ to $-.05$) and was no longer significant with the emotion variables in the equation. Finally, the z' test also confirmed the presence of mediation through positive outcome emotions, $z' = 2.24$, $p < .01$, and negative outcome emotions, $z' = 2.12$, $p < .01$, for mastery goals, and the direct influence of mastery goals on performance was reduced 90.9% (from $\beta = .11$ to $.01$) and was no longer nearly significant with the emotion variables in the equation. All of the significant relations in these analyses remained significant when controlling for social desirability, trait affectivity, and scholastic ability.

Discussion

The study of achievement goals and achievement emotions has taken place in relative isolation, and the present research aims to redress this lack of conceptual and empirical integration. In doing so, we proffered a model linking achievement goals, achievement emotions, and academic performance that extends our prior work in this area (Pekrun et al., 2006). The model posits that achievement goals influence students' achievement emotions and that both goals and emotions influence students' academic performance, with emotions serving the role of mediators in the link between goals and performance.

The model is consistent with achievement motivation theories such as the hierarchical model of approach-avoidance achievement motivation (Elliot & Church, 1997; Elliot & Thrash, 2001), and with achievement emotion theories such as the control–value theory of discrete achievement emotions (Pekrun, 2006; Pekrun et al., 2007). From the perspective of goal research and the hierarchical model, our model specifies how goals influence important emotion and performance outcome variables and how emotions represent a mediating process that can account for the impact of goals on performance. From the perspective of emotion research and the control–value theory, the model identifies one important group of antecedents of students' emotions, their achievement goals, and one important outcome variable, their academic performance, and delineates the links between emotions, goal antecedents, and performance outcomes. Although the two perspectives emphasize different variables as focal constructs (goals vs. emotions), they are best viewed as complementary rather than mutually exclusive. When integrated, they provide a more complete portrait of psychological functioning in achievement contexts than either perspective provides alone.

The findings of the present research largely supported our hypotheses, although some unexpected findings also emerged. In the following, we discuss each pattern of results in turn.

Predictive Relations of Achievement Goals and Achievement Emotions

As expected, there were clear links between students' goals for an important midterm exam a week prior to the exam and their emotions experienced the day before the event. In line with the propositions of our theoretical model, mastery goals related to activity emotions, and performance-base goals related to outcome emotions. More specifically, mastery goals were a positive predictor of enjoyment and a negative predictor of boredom and anger. Performance-approach goals positively predicted pride and hope, and performance-avoidance goals positively predicted anxiety, hopelessness, and shame. Importantly, these links were robust when controlling for social desirability, trait positive and negative affectivity, and scholastic ability. These findings rule out the possibility that our results were merely due to the influence of these potential confounding variables.

Notably, the hypothesized link between performance-approach goals and hope that was not well-supported in our previous research (Pekrun et al., 2006) was clearly confirmed in the present study. Furthermore, the links between performance-approach goals and pride and between performance-avoidance goals and shame were clearer in the present study than in our previous research. A likely explanation for these differences is that we used a situationally circumscribed, exam-specific approach in the present study, whereas our prior research relied on omnibus, class-general measures of both goals and emotions. The exam context tends to make performance contingencies and related performance-based goals quite salient and may, accordingly, enhance the predictive utility of such goals in relation to achievement emotions.

In addition to the hypothesized relations, we observed a few additional links that we had not anticipated (although they were not contradictory to our hypotheses per se). Mastery goals were a positive predictor of hope and pride, and were a negative predictor of hopelessness and shame. Performance-avoidance goals were a negative predictor of hope and pride, and were a positive predictor of anger. The positive relations between mastery goals and both hope and pride replicated the findings of our previous research (Pekrun et al., 2006), as did the negative relation between performance-avoidance goals and pride. The additional mastery goal relations suggest that students not only focus on ongoing learning activities when oriented toward mastery goals, but also think prospectively about the chance to gain competence, and retrospectively about their competence gains already acquired. This may

---

[5] As would be expected given the pattern of results from the individual emotion variable analyses, the following relations between achievement goals and the achievement emotion categories were observed (the positive activity emotion results are, of course, identical to the enjoyment results): For negative activity emotions, mastery goals were a negative predictor, $F(1, 214) = 32.24$, $p < .001$ ($\beta = -.35$), and performance-avoidance goals were a positive predictor, $F(1, 214) = 4.46$, $p < .05$ ($\beta = .20$). For positive outcome emotions, mastery goals were a positive predictor, $F(1, 214) = 40.50$, $p < .001$ ($\beta = .39$), performance-approach goals were a positive predictor, $F(1, 214) = 17.40$, $p < .001$ ($\beta = .39$), and performance-avoidance goals were a negative predictor, $F(1, 214) = 13.29$, $p < .001$ ($\beta = -.34$). For negative outcome emotions, mastery goals were a negative predictor, $F(1, 214) = 7.22$, $p < .01$ ($\beta = -.18$), and performance-avoidance goals were a positive predictor, $F(1, 214) = 9.27$, $p < .01$ ($\beta = .31$).

particularly, or even exclusively, be the case in highly structured evaluative situations, such as the exam context in our study. The additional performance-avoidance goal relations suggest that hopelessness and shame evoked by performance-avoidance goals may themselves inhibit the experience of hope and pride; that these goals facilitate anger perhaps should come as no surprise, given the aversive nature of task engagement during avoidance goal pursuit.

Importantly, although the majority of findings from regression analysis were in line with the bivariate correlations between goals and emotions, some of the findings for performance-based goals emerged after controlling other goals in regression analysis. Specifically, this was the case for performance-approach goals as positive predictors of hope, and for performance-avoidance goals as negative predictors of hope and pride, and as positive predictors of hopelessness. This finding suggests that research analyzing bivariate relations between goals and affect or emotions may have overlooked more specific relations that become clear when controlling other goals. Future research should do this and should also control for mastery-avoidance goals that were not addressed in the present study.

The overall pattern of findings supports the proposition that the links between achievement goals and students' subsequent affective reactions are clearer for discrete emotions, as compared with general positive and negative affect. There is convergence regarding mastery goals; these goals have been consistent positive predictors of general positive affect in previous studies (Kaplan & Maehr, 1999; Linnenbrink, 2005; Meece, Blumenfeld, & Hoyle, 1988; Nicholls, Patashnick, & Nolen, 1985; Nolen & Haladyna, 1990; Pintrich, 2000; Roeser, Midgley, & Urdan, 1996; Seifert, 1995), and were consistent positive predictors of discrete positive emotions (i.e., enjoyment, hope, and pride) in the present research. Regarding performance-based goals, however, a different picture emerges. In prior research, performance-approach goals have been either positively related or unrelated to general positive affect (Linnenbrink, 2005; Meece et al., 1988; Nicholls et al., 1985; Nolen & Haladyna, 1990; Roeser et al., 1996; Seifert, 1995; J. C. Turner et al., 1998); the present research suggests that performance-approach goals may be differentially linked to different positive emotions. Specifically, performance-approach goals were positive predictors of the outcome emotions hope and pride but were unrelated to the activity emotion enjoyment. These differential linkages may help explain the unclear relation with general positive affect observed in prior work. Similarly, performance-avoidance goals have been either positively related to or unrelated to general negative affect in previous research (Sideridis, 2003, 2005a). The present results suggest that performance-avoidance goals are differentially linked to different negative emotions, with clear negative links to the outcome emotions anxiety, hopelessness, and shame, and no relation to the activity emotion boredom. In conclusion, the present findings support the specificity proposal implied by both Linnenbrink and Pintrich's (2002) and Pekrun et al.'s (2006) models of goal–emotion links, suggesting that there are differential relationships between achievement goals and subsequent discrete affective reactions.

Joint and Mediated Relations of Achievement Goals and Achievement Emotions With Academic Performance

Achievement goals and performance. In line with our hypotheses, performance-approach goals were positive predictors of per-

formance, performance-avoidance goals were negative predictors of performance, and mastery goals tended to be positive, but weak, predictors of performance. These results were robust when controlling for social desirability, trait positive and negative affectivity, and scholastic ability. Thus, mastery and performance-based goals appear to be of comparable predictive utility with regard to achievement emotions, but as noted by others (Elliot & Church, 1997; Harackiewicz, Barron, Carter, Lehto, & Elliot, 1997), performance-based goals seem to be the stronger, more robust predictors of performance, at least for undergraduates' short-term performance in normatively evaluated examination contexts (see Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Midgley et al., 2001). Mastery goals may be stronger predictors of performance for younger individuals, in task-based evaluative contexts and, perhaps, for challenging or inherently enjoyable tasks (also see Linnenbrink-Garcia et al., in press).

Predicting performance: Incremental effects of emotions. Hope and pride were positive predictors of performance, whereas boredom, anger, anxiety, hopelessness, and shame were negative predictors of performance. These results are highly consistent with the predictions of our model, because all of the anticipated relations were supported, except for the lack of a positive relation for enjoyment. When combining emotions within emotion categories and analyzing the simultaneous influence of emotions on performance, it was the positive and negative outcome emotion categories that emerged as significant, independent predictors of performance. All of these results were obtained while controlling for achievement goals, meaning that the observed links were not mere artifacts of the goal–performance relation; furthermore, these findings also held when controlling for social desirability, trait positive and negative affectivity, and scholastic ability. The findings thus corroborate theories positing that emotions substantially affect academic performance, over and above the influence of cognitive ability or motivation (Pekrun, 2006; Zeidner, 1998). Also, as with relations between achievement goals and general affect (vs. discrete emotions), the findings suggest that links with performance are clearer for students' discrete emotions, as compared to general positive and negative affect (Linnenbrink, 2007).

The observed results do not support predictions from some traditions of experimental mood research that imply that positive affect should be detrimental to, and negative affect beneficial for, cognitive performance. For example, in mood-as-information approaches, it is assumed that positive affective states signal that all is well, whereas negative states imply that something is going wrong (e.g., Bless et al., 1996). The feeling that all is well suggests that there is no need to invest effort, which would likely reduce performance. In contrast, negative states suggest that action and the investment of effort are needed, which would likely benefit performance. Furthermore, negative affect is hypothesized by some to induce *mood repair* (e.g., Schaller & Cialdini, 1990), which should also enhance effort and, accordingly, performance. As summarized by Aspinwall (1998), these approaches imply that "our primary goal is to feel good, and feeling good makes us lazy thinkers who are oblivious to potentially useful negative information and unresponsive to meaningful variations in information and situation" (p. 7), and that negative emotions would benefit effort and performance.

As argued by Pekrun et al. (2002b), it is open to question whether assumptions from experimental mood research are gener-

alizable to real-life field settings and the more intense emotions experienced in these settings. It may be that different mechanisms are operating under natural conditions or that these mechanisms interact in different ways. The present findings indeed suggest that positive emotions benefit students' performance on an important exam (with the possible exception of enjoyment) and that negative emotions are uniformly detrimental to performance, in line with assumptions of the control–value theory of achievement emotions (Pekrun, 2006), and in contrast to the views cited earlier.

Our findings are consistent with previous research on achievement-related anxiety (Hembree, 1988; Zeidner, 2007), and, importantly, they extend the emotion–performance link to achievement emotions beyond anxiety. It is easy to see how negative emotions such as boredom and hopelessness that represent deactivation, withdrawal of engagement, and superficial processing of information could be deleterious for performance, but we found that the more activating negative emotions of anger and shame also negatively predicted performance. These emotions may initially spur on active coping with the challenge at hand, but this initial activity may be difficult to sustain given the highly aversive nature of negative emotional arousal and its negative effects on intrinsic motivation, flexible use of learning strategies, and cognitive resources (Meinhardt & Pekrun, 2003; Pekrun et al., 2002a). An important avenue for future research is to explore the precise processes that account for the negative impact of the focal emotions on performance. The test anxiety literature, which has done an excellent job in this regard (Spielberger & Vagg, 1987; Zeidner, 2007), can serve as a prototype and guide for such empirical work. We should also note that the influence of anger and shame on performance, much like the influence of anxiety, need not always be negative; these emotions may exhibit null or perhaps even positive relations with performance on some tasks, for some individuals, and under some circumstances (Pekrun, 2006; J. E. Turner & Schallert, 2001).

Our results not only extend the emotion–performance link to negative emotions beyond anxiety but also to the positive emotions of hope and pride that actually facilitate performance attainment. These emotions may spur on and sustain concentrated, appetitive effort to prepare for the upcoming evaluative event, and they may enhance the quality and flexibility of the effort expended (Fredrickson, 2001). Here again, an important next step would be to examine the processes that explain how these positive emotions exert their positive impact on performance.

The one unexpected finding regarding Hypothesis 3 is that enjoyment of learning did not predict performance. A few other studies have acquired evidence for a positive link between enjoyment and performance (Helmke, 1993; Pekrun et al., 2002a), and conceptually it seems sensible that enjoyment would support the effort, appetitive engagement, and task absorption that usually facilitate performance (Pekrun, 2006). One possible explanation for our null finding is that enjoyment in achievement contexts has more complex implications for performance than initially anticipated. For some students, enjoyment may support the aforementioned positive processes, but for others, it may indeed be construed as a signal that "all is well," as suggested by the mood-as-information approaches cited earlier implying that additional preparation and effort are not needed. Furthermore, because positive affect has been shown to induce concept-driven, flexible ways of thinking rather than careful bottom-up processing (Fiedler, 2001), it may also be that

enjoyment inhibits attending to the rote-level learning that is often necessary for successful performance on tasks such as undergraduate exams.

By seducing students to de-emphasize the immediate demands of academic exams and to engage in more pleasurable and creative approaches to academic tasks, enjoyment may function in ways similar to mastery goals. Taken together with the results on links between achievement goals and performance, the findings indeed suggest an interesting symmetry between mastery goals and the activity emotion enjoyment in the present context of preparing for an exam: Both variables are weakly related or unrelated to performance, in contrast to performance-based goals and outcome emotions, which were clearer and stronger predictors of performance.

Mediation of the relation between achievement goals and performance by achievement emotions.   Our model posits that emotions mediate the link between achievement goals and performance attainment. In accord with this prediction, mediation was found involving all three goals, and with seven of the eight focal emotions.

For performance-approach goals, significant indirect links were observed between these goals and performance through both hope and pride. In each instance, the direct goal–performance relations remained significant when the mediational role of these emotions was considered, and the proportion of the goal-performance relation accounted for by these emotions was moderate (21% for hope and 34% for pride). For performance-avoidance goals, significant indirect links were found between these goals and performance through six emotions: hope, pride, anger, anxiety, hopelessness, and shame. In each instance, the direct goal–performance link was no longer significant with the focal emotion variable in the equation, and the proportion of the goal–performance link accounted for by these emotions was substantial, ranging from 30% (for anger) to 54% (for shame). For mastery goals, significant indirect links were observed between these goals and performance through six emotions: hope, pride, boredom, anger, hopelessness, and shame. In each instance, the direct goal–performance relation was no longer close to significance with the focal emotion variable in the equation, and the proportion of the goal–performance relation accounted for by these emotions ranged from 54% (for anger) to 90% (for hope and hopelessness). In the combined emotion categories analysis, positive outcome emotions were shown to be mediators of the goal–performance relation for all three goals, whereas negative outcome emotions were shown to be mediators of this relation for performance-avoidance and mastery goals only. All of these results held when controlling for social desirability, trait positive and negative affectivity, and scholastic ability.

Although mediation was documented for all three achievement goals, it was not documented to an equal extent for each. The mediational results were least strong for performance-approach goals for the upcoming exam. In line with our predictions, mediation was documented for the two positive outcome emotions, but these emotions explained only a moderate proportion of the overall effect of these goals. The direct effect of performance-approach goals remained significant when including these emotions in the regression equation, indicating that there was partial mediation by the emotion variable. These findings suggest the need to attend to additional processes such as effort expenditure, persistence, or aspiration level (Elliot et al., 1999; Harackiewicz & Elliot, 1998; Lee et al., 2003; Lopez, 1999) to more fully account for the

influence of performance-approach goals on performance. The mediational results for performance-avoidance goals were quite strong, as mediation was found for six emotions, and accounting for these emotions eliminated the direct goal–performance relation.

The picture regarding mastery goals is perhaps the most intriguing. On the one hand, the relation between these goals and performance was quite weak, only attaining near significance. On the other hand, six emotions were validated as mediators of this relation and, in most instances, nearly completely eliminated the goal–performance relation. This coupling of a weak, not quite significant overall effect with clearly significant indirect effects may seem puzzling at first sight but, as noted at the outset, is fully consistent with recent perspectives on mediation showing that mediation can occur even with an overall relation that is far from attaining statistical significance (MacKinnon et al., 2007; Shrout & Bolger, 2002). The power of contemporary tests of indirect effects certainly plays a role in detecting such mediation (MacKinnon et al., 2002). Furthermore, it may be that multiple, but reciprocal processes or multiple, but sequential processes are operative in the relation between mastery goals and performance, and that such processes are weakening the overall relation (see Collins et al., 1998; Shrout & Bolger, 2002). The precise nature of these processes, however, is not clear. The role of mastery goals in performance processes remains something of a mystery in the achievement goal literature, and is an issue clearly in need of sustained and systematic research attention.

Limitations and Suggestions for Future Research

Some limitations of the present research are important to note and may be used to suggest additional directions for future research. First, mastery goals were conceptualized as mastery-approach goals in our study; mastery-avoidance goals were not included. Similarly, the emotions addressed in this study were the eight important emotion variables that we identified and focused on in our previous research (Pekrun et al., 2006), but other possibilities were excluded (e.g., social emotions such as admiration and contempt). We are fully aware of the importance of considering mastery-avoidance goals in achievement goal research, and of considering a broad variety of emotions in achievement emotion research. However, we also think it is best to begin the process of examining complex patterns of goal–emotion relations with a simplified goal model and a limited set of emotions that focus on the goals and emotions most commonly endorsed in undergraduate classrooms (see Elliot & McGregor, 2001; Pekrun et al., 2002a). In future research, however, systematic attempts should indeed be made to link the full 2×2 model of achievement goals (Elliot, 1999) to a broad variety of emotions, including both individually referenced emotions and social emotions (Elliot & Pekrun, 2007; Weiner, 2007). Furthermore, research should link achievement goals not only to students' emotions per se, but also to their attempts to regulate these emotions (Schutz & Davis, 2000; Tyson, Linnenbrink-Garcia, & Hill, 2008).

Second, an issue to be considered in interpreting the present findings is the bivariate relation between performance-approach goals and performance-avoidance goals. As in other studies analyzing performance-based goals relating to exam performance (Elliot & Murayama, 2008; Zusho et al., 2005), this relation was quite strong. The use of multiple regression made it possible to disentangle the specific relationships between approach versus avoidance performance goals, on the one hand, and emotions and exam performance, on the other. Nevertheless, future research could attempt to construct more "pure" measures of the approach and avoidance components of performance goals, so that construct overlap is reduced.

In addition, although the present study advanced prior research by using a situationally specific rather than a molar assessment of goals and emotions, this advantage also implies that some of our findings may apply only to the specific type of exam-related context that was examined. That is, the weak relation between mastery goals and performance, and the null relation between enjoyment and performance, may be specific to academic contexts in which normative standards and externally provided competence feedback are used. Future studies should address the relations among goals, emotions, and performance in other kinds of achievement settings as well.

Finally, the present research examined the influence of goals on emotions and the joint influence of goals and emotions on performance. However, as argued by Linnenbrink and Pintrich (2002; see also Linnenbrink, 2007), emotions themselves may influence goal adoption, implying that goals and emotions may be linked by reciprocal rather than unidirectional causation. Indeed, in our prior research (Pekrun et al., 2006), we found that positive and negative affectivity predicted students' course-related achievement goals, in line with prior research showing that affect can influence goal adoption (Linnenbrink & Pintrich, 2002). Similarly, although students' goals and emotions can influence their academic performance, success and failure can exert an important impact on students' goal adoption and emotional experience (e.g., Meece, Wigfield, & Eccles, 1990; Pekrun, 1992a). As such, subsequent research would do well to systematically address reciprocal links among goals, emotions, and performance over time.

Conclusion

The present study contributes to the nascent, but emerging, literature on achievement goals and achievement emotions in two ways. First, it more firmly establishes links between achievement goals and discrete emotions, demonstrating that the results found in our prior work (Pekrun et al., 2006) replicate and, indeed, are stronger when examined using a situationally specific approach to assessment. Second, in the present research we extend the model proffered in our prior work to include performance outcomes and the joint influence of achievement goals and emotions on such outcomes. Our model posits, and our findings confirm, that goals and emotions are both important predictors of performance attainment, but that these constructs serve different functional roles. Achievement goals direct individuals toward or away from potential competence-relevant outcomes and have a distal influence on these outcomes through psychological processes, such as achievement emotions. The different foci of achievement goals evoke different emotions during the process of task engagement, and these emotions exert a proximal influence on performance outcomes. In integrating two central achievement-relevant constructs in terms of distal and proximal functions, our model fits nicely within the broader frameworks provided by the hierarchical model of approach–avoidance achievement motivation (Elliot & Thrash,

2001) and the control–value theory of discrete achievement emotions (Pekrun, 2006).

From an applied perspective, our findings highlight the potential benefit of attending to both students' goals and their emotions in structuring learning environments and considering opportunities for intervention. Achievement goal theorists have focused on establishing classrooms and schools and designing classroom- and school-level interventions that foster mastery goal adoption (Ames, 1992; Anderman & Maehr, 1994; Maehr & Midgley, 1991; Meece, Anderman, & Anderman, 2006) and minimize performance-avoidance goal adoption (Elliot, 1999; Elliot et al., 2005). Achievement emotion theorists have focused primarily on making evaluative settings less anxiety provoking for students (Covington, 1992; Hill & Wigfield, 1984) and on developing individual psychotherapeutic treatments to help students cope with debilitating test anxiety (Spielberger & Vagg, 1987; Zeidner, 1998). The aim of both groups of scholars is to facilitate and support student competence and overall psychological functioning in structured educational environments, but to date there has been little cross-talk among these educators seeking the same ultimate goal. Our research suggests that a multifaceted approach to applied considerations is needed, one that attends to both achievement goals and a broader set of achievement emotions (beyond anxiety) in an integrative fashion.

References

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

Anderman, E. M., & Maehr, M. L. (1994). Motivation and schooling in the middle grades. *Review of Educational Research, 64,* 287–309.

Arbuckle, J. L. (2003). *AMOS 5* [Computer software]. Chicago: SmallWaters.

Ashby, F. G., Isen, A. M., & Turken, A. U. (1999). A neuropsychological theory of positive affect and its influence on cognition. *Psychological Review, 106,* 529–550.

Aspinwall, L. (1998). Rethinking the role of positive affect in self-regulation. *Motivation and Emotion, 22,* 1–32.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategical, and statistical considerations. *Journal of Personality and Social Psychology, 51,* 1173–1182.

Bless, H., Clore, G. L., Schwarz, N., Golisano, V., Rabe, C., & Wölk, M. (1996). Mood and the use of scripts: Does a happy mood really lead to mindlessness? *Journal of Personality and Social Psychology, 71,* 665–679.

Boekaerts, M. (1993). Anger in relation to school learning. *Learning and Instruction, 3,* 269–280.

Brett, J. F., & VandeWalle, D. (1999). Goal orientation and goal content as predictors of performance in a training program. *Journal of Applied Psychology, 84,* 863–873.

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

Clark, L. A., & Watson, D. (1995). *The Brief Temperament Survey (BTS).* Unpublished manuscript, Department of Psychology, University of Iowa, Iowa City.

Collins, L. M., Graham, J. W., & Flaherty, B. P. (1998). An alternative framework for defining mediation. *Multivariate Behavioral Research, 33,* 295–312.

Covington, M. V. (1992). *Making the grade: A self-worth perspective on motivation and school reform.* Cambridge, MA: Cambridge University Press.

Cury, F., Elliot, A. J., Da Fonseca, D., & Moller, A. C. (2006). The social–cognitive model of achievement motivation and the 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology, 90,* 666–679.

Cury, F., Elliot, A. J., Sarrazin, P., Da Fonseca, D., & Rufo, M. (2002). The trichotomous achievement goal model and intrinsic motivation: A sequential mediational analysis. *Journal of Experimental Social Psychology, 38,* 473–481.

Daniels, L., Haynes, T., Stupnisky, R., Perry, R. P., Newall, N., & Pekrun, R. (in press). Individual differences in achievement goals: A longitudinal study of cognitive, emotional, and achievement outcomes. *Contemporary Educational Psychology.*

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

Elliot, A. J. (1997). Integrating "classic" and "contemporary" approaches to achievement motivation: A hierarchical model of approach and avoidance achievement motivation. In P. Pintrich & M. Maehr (Eds.), *Advances in motivation and achievement* (Vol. 10, pp. 143–179). Greenwich, CT: JAI Press.

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

Elliot, A. J., & Church, M. A. (1997). A hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 72,* 218–232.

Elliot, A. J., & Church, M. A. (2003). A motivational analysis of defensive pessimism and self-handicapping. *Journal of Personality, 71,* 369–396.

Elliot, A. J., & Harackiewicz, J. M. (1996). Approach and avoidance achievement goals and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology, 70,* 461–475.

Elliot, A. J., & McGregor, H. (1999). Test anxiety and the hierarchical model of approach and avoidance achievement motivation. *Journal of Personality and Social Psychology, 76,* 628–644.

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

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

Elliot, A. J., & Moller, A. (2003). Performance-approach goals: Good or bad forms of regulation? *International Journal of Educational Research, 39,* 339–356.

Elliot, A. J., & Murayama, K. (2008). On the measurement of achievement goals: Critique, illustration, and application. *Journal of Educational Psychology, 100,* 613–628.

Elliot, A. J., & Pekrun, R. (2007). Emotion in the hierarchical model of approach–avoidance achievement motivation. In P. A. Schutz & R. Pekrun (Eds.), *Emotion in education* (pp. 57–73). San Diego, CA: Academic Press.

Elliot, A. J., Shell, M. M., Bouas Henry, K., & Maier, M. A. (2005). Achievement goals, performance contingencies, and performance attainment: An experimental test. *Journal of Educational Psychology, 97,* 630–640.

Elliot, A. J., & Thrash, T. M. (2001). Achievement goals and the hierarchical model of achievement motivation. *Educational Psychology Review, 12,* 139–156.

Elliott, E. S., & Dweck, C. (1988). Goals: An approach to motivation and achievement. *Journal of Personality and Social Psychology, 54,* 5–12.

Fiedler, K. (2001). Affective states trigger processes of assimilation and accommodation. In L. L. Martin & G. L. Clore (Eds.), *Theories of mood and cognition: A user's guidebook* (pp. 85–98). Mahwah, NJ: Erlbaum.

Finney, S. J., Pieper, S. L., & Barron, K. E. (2004). Examining the psychometric properties of the Achievement Goals Questionnaire in a general academic context. *Educational and Psychological Measurement, 64,* 365–382.

Fredrickson, B. L. (2001). The role of positive emotions in positive

psychology: The broaden-and-build theory of positive emotions. *American Psychologist, 56,* 218–226.

Frenzel, A. C., Thrash, T. M., Pekrun, R., & Goetz, T. (2007). Achievement emotions in Germany and China: A cross-cultural validation of the Academic Emotions Questionnaire–Mathematics (AEQ-M). *Journal of Cross-Cultural Psychology, 38,* 302–309.

Goetz, T., Frenzel, A. C., Pekrun, R., Hall, N. C., & Lüdtke, O. (2007). Between- and within-domain relations of students' academic emotions. *Journal of Educational Psychology, 99,* 715–733.

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

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

Harackiewicz, J. M., & Elliot, A. J., (1998). The joint effects of target and purpose goals on intrinsic motivation: A mediational analysis. *Personality and Social Psychology Bulletin, 24,* 675–689.

Helmke, A. (1993). Die Entwicklung der Lernfreude vom Kindergarten bis zur 5. Klassenstufe [Development of learning enjoyment from kindergarten to grade five]. *Zeitschrift für Pädagogische Psychologie, 7,* 77–86.

Hembree, R. (1988). Correlates, causes, effects, and treatment of test anxiety. *Review of Educational Research, 58,* 47–77.

Hill, K. T., & Wigfield, A. (1984). Test anxiety: A major educational problem and what can be done about it. *Elementary School Journal, 85,* 105–126.

Hoyle, R., & Panter, A. (1995). Writing about structural equation models. In R. Hoyle (Ed.), *Structural equation modeling: Concepts, issues, and applications* (pp. 100–119). Thousand Oaks, CA: Sage.

Kaplan, A., & Maehr, M. L. (1999). Achievement goals and student well-being. *Contemporary Educational Psychology, 24,* 330–358.

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

Klein, H. J., Noe, R. A., & Wang, C. (2006). Motivation to learn and course outcomes: The impact of delivery mode, learning goal orientation, and perceived barriers and enablers. *Personnel Psychology, 59,* 665–702.

Kumar, S., & Jagacinski, C. M. (2006). Imposters have goals too: The imposter phenomenon and its relationship to achievement goal theory. *Personality and Individual Differences, 40,* 147–157.

Larson, R., Hecker, B., & Norem, J. (1985). Students' experience with research projects: Pains, enjoyment and success. *High School Journal, 69,* 61–69.

Lee, F. K., Sheldon, K. M., & Turban, D. B. (2003). Personality and the goal-striving process: The influence of achievement goal patterns, goal level, and mental focus on performance and enjoyment. *Journal of Applied Psychology, 88,* 256–265.

Linnenbrink, E. A. (2005). The dilemma of performance-approach goals: The use of multiple goal contexts to promote students' motivation and learning. *Journal of Educational Psychology, 97,* 197–213.

Linnenbrink, E. A. (2007). The role of affect in student learning: A multi-dimensional approach to considering the interaction of affect, motivation, and engagement. In P. A. Schutz & R. Pekrun (Eds.), *Emotion in education* (pp. 107–124). San Diego, CA: Academic Press.

Linnenbrink, E. A., & Pintrich, P. R. (2002). Achievement goal theory and affect: An asymmetrical bidirectional model. *Educational Psychologist, 37,* 69–78.

Linnenbrink, E. A., Ryan, A. M., & Pintrich, P. R. (1999). The role of goals and affect in working memory functioning. *Learning and Individual Differences, 11,* 213–230.

Linnenbrink-Garcia, L., Tyson, D. F., & Patall, E. A. (in press). When are achievement goal orientations beneficial for academic achievement? A closer look at main effects and moderating factors. *International Journal of Social Psychology.*

Lopez, D. F. (1999). Social cognitive influences on self-regulated learning: The impact of action-control beliefs and academic goals on achievement-related outcomes. *Learning and Individual Differences, 11,* 301–319.

MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). Mediation analysis. *Annual Review of Psychology, 58,* 593–614.

MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods, 7,* 83–104.

Maehr, M. L., & Midgley, C. (1991). Enhancing student motivation: A schoolwide approach. *Educational Psychologist, 26,* 399–427.

Malka, A., & Covington, M. V. (2005). Perceiving school performance as instrumental to future goal attainment: Effects on graded performance. *Contemporary Educational Psychology, 30,* 60–80.

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

Meece, J. L., Anderman, E. M., & Anderman, L. H. (2006). Classroom goal structure, student motivation, and academic achievement. *Annual Review of Psychology, 57,* 487–503.

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

Meece, J. L., Wigfield, A., & Eccles, J. S. (1990). Predictors of math anxiety and its influence on young adolescents' course enrollment intentions and performance in mathematics. *Journal of Educational Psychology, 82,* 60–70.

Meinhardt, J., & Pekrun, R. (2003). Attentional resource allocation to emotional events: An ERP study. *Cognition and Emotion, 17,* 477–500.

Meyer, D. K., Turner, J. C., & Spencer, C. A. (1997). Challenge in mathematics classrooms: Students' motivation and strategies in project-based learning. *Elementary School Journal, 97,* 501–521.

Middleton, M. J., & Midgley, C. (1997). Avoiding the demonstration of lack of ability: An underexplored aspect of goal theory. *Journal of Educational Psychology, 89,* 710–718.

Midgley, C., Kaplan, A., & Middleton, M. (2001). Performance-approach goals: Good for what, for whom, under what circumstances, and at what cost? *Journal of Educational Psychology, 93,* 77–86.

Murayama, K., & Elliot, A. J. (in press). The joint influence of personal achievement goals and classroom goal structures on achievement-related outcomes. *Journal of Educational Psychology.*

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

Nicholls, J. G., Patashnick, M., & Nolen, S. B. (1985). Adolescents' theories of education. *Journal of Educational Psychology, 77,* 683–692.

Nolen, S. B., & Haladyna, T. M. (1990). Motivation and studying in high school science. *Journal of Research in Science Education, 27,* 115–126.

Olafson, K. M., & Ferraro, F. R. (2001). Effects of emotional state on lexical decision performance. *Brain and Cognition, 45,* 15–20.

Pajares, F., & Cheong, Y. F. (2004). Achievement goal orientations in writing: A developmental perspective. *International Journal of Educational Research, 39,* 437–455.

Pajares, F., & Valiante, G. (2001). Gender differences in writing motivation and achievement of middle school students: A function of gender orientation? *Contemporary Educational Psychology, 26,* 366–381.

Paulhus, D. L. (1991). Measurement and control of response bias. In J. P. Robinson, P. Shaver, & L. S. Wrightsman (Eds.), *Measures of personality and social psychological attitudes* (pp. 17–59). San Diego, CA: Academic Press.

Pekrun, R. (1992a). The expectancy-value theory of anxiety: Overview and implications. In D. G. Forgays, T. Sosnowski, & K. Wrzesniewski

(Eds.), *Anxiety: Recent developments in self-appraisal, psychophysiological and health research* (pp. 23–41). Washington, DC: Hemisphere.

Pekrun, R. (1992b). Kognition und Emotion in studienbezogenen Lern- und Leistungssituationen: Explorative Analysen [Cognition and emotion in achievement settings: An exploratory analysis]. *Unterrichtswissenschaft, 20,* 308–324.

Pekrun, R. (2006). The control–value theory of achievement emotions: Assumptions, corollaries, and implications for educational research and practice. *Educational Psychology Review, 18,* 315–341.

Pekrun, R., Elliot, A. J., & Maier, M. A. (2006). Achievement goals and discrete achievement emotions: A theoretical model and prospective test. *Journal of Educational Psychology, 98,* 583–597.

Pekrun, R., Frenzel, A., Goetz, T., & Perry, R. P. (2007). The control–value theory of achievement emotions: An integrative approach to emotions in education. In P. A. Schutz & R. Pekrun (Eds.), *Emotion in education* (pp. 13–36). San Diego, CA: Academic Press.

Pekrun, R., Goetz, T., & Perry, R. P. (2005). *Academic Emotions Questionnaire (AEQ). User's manual.* Department of Psychology, University of Munich.

Pekrun, R., Goetz, T., Perry, R. P., Kramer, K., & Hochstadt, M. (2004). Beyond test anxiety: Development and validation of the Test Emotions Questionnaire (TEQ). *Anxiety, Stress and Coping, 17,* 287–316.

Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002a). Academic emotions in students' self-regulated learning and achievement: A program of quantitative and qualitative research. *Educational Psychologist, 37,* 91–106.

Pekrun, R., Goetz, T., Titz, W., & Perry, R. P. (2002b). Positive emotions in education. In E. Frydenberg (Ed.), *Beyond coping: Meeting goals, visions, and challenges* (pp. 149–174). Oxford, England: Elsevier.

Pintrich, P. R. (2000). Multiple goals, multiple pathways: The role of goal orientation in learning and achievement. *Journal of Educational Psychology, 92,* 544–555.

Porath, C. L., & Bateman, T. S. (2006). Self-regulation: From goal orientation to job performance. *Journal of Applied Psychology, 91,* 185–192.

Roeser, R., Midgley, C., & Urdan, R. (1996). Perceptions of the school psychological climate and early adolescents' self-appraisals and academic engagement. *Journal of Educational Psychology, 88,* 408–422.

Rosenberg, E. L. (1998). Levels of analysis and the organization of affect. *Review of General Psychology, 2,* 247–270.

Schaller, M., & Cialdini, R. B. (1990). Happiness, sadness, and helping: A motivational integration. In R. Sorrentino & E. T. Higgins (Eds.), *Handbook of motivation and cognition: Foundations of social behavior* (Vol. 2, pp. 265–296). New York: Guilford Press.

Scherer, K. R. (2000). Emotions as episodes of subsystems synchronization driven by nonlinear appraisal processes. In I. Granic & M. D. Lewis (Eds.), *Emotion, development, and self-organization: Dynamic systems approaches to emotional development* (pp. 70–99). New York: Cambridge University Press.

Schutz, P. A., & Davis, H. A. (2000). Emotions and self-regulation during test-taking. *Educational Psychologist, 35,* 243–256.

Schutz, P. A., & Pekrun, R. (Eds.). (2007). *Emotion in education.* San Diego, CA: Academic Press.

Seifert, T. (1995). Academic goals and emotions: A test of two models. *Journal of Psychology, 129,* 543–552.

Senko, C., & Harackiewicz, J. M. (2005). Regulation of achievement goals: The role of competence feedback. *Journal of Educational Psychology, 97,* 320–336.

Shih, S.-S. (2005). Role of achievement goals in children's learning in Taiwan. *Journal of Educational Research, 98,* 310–319.

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

Sideridis, G. D. (2003). On the origins of helpless behavior of students with learning disabilities: Avoidance motivation? *International Journal of Educational Research, 39,* 497–517.

Sideridis, G. D. (2005a). Goal orientation, academic achievement, and depression: Evidence in favor of a revised goal theory framework. *Journal of Educational Psychology, 97,* 366–375.

Sideridis, G. D. (2005b). Performance approach–avoidance motivation and planned behavior theory: Model stability with Greek students with and without learning disabilities. *Reading and Writing Quarterly, 21,* 331–359.

Sideridis, G. D. (2007). Why are students with learning disabilities depressed? A goal orientation model of depression vulnerability. *Journal of Learning Disabilities, 40,* 526–539.

Silver, L. S., Dwyer, S., & Alford, B. (2006). Learning and performance goal orientation of salespeople revisited: The role of performance-approach and performance-avoidance orientations. *Journal of Personal Selling and Sales Management, 26,* 27–38.

Skaalvik, E. M. (1997). Self-enhancing and self-defeating ego orientation: Relations with task and avoidance orientation, achievement, self-perceptions, and anxiety. *Journal of Educational Psychology, 89,* 71–81.

Spielberger, C. D. (1972). Anxiety as an emotional state. In C. D. Spielberger (Ed.), *Anxiety: Current trends in theory and research* (Vol. 1, pp. 23–49). New York: Academic Press.

Spielberger, C. D., & Vagg, P. R. (1987). The treatment of test anxiety: A transactional process model. In R. Schwarzer, H. van der Ploeg, & C. Spielberger (Eds.), *Advances in test anxiety research* (Vol. 5, pp. 179–186). Hillsdale, NJ: Erlbaum.

Sullivan, H. W., Worth, K. A., Baldwin, A. S., & Rothman, A. J. (2006). The effect of approach and avoidance referents on academic outcomes: A test of competing predictions. *Motivation and Emotion, 30,* 156–163.

Tanaka, A., Takehara, T., & Yamauchi, H. (2006). Achievement goals in a presentation task: Performance expectancy, achievement goals, state anxiety, and task performance. *Learning and Individual Differences, 16,* 93–99.

Tanaka, A., & Yamauchi, H. (2000). Causal models of achievement motive, goal orientation, intrinsic interest, and academic achievement in classroom. *Shinrigaku Kenkyu: Japanese Journal of Psychology, 71,* 317–324.

Tanaka, A., & Yamauchi, H. (2001). A model for achievement motives, goal orientations, intrinsic interest, and academic achievement. *Psychological Reports, 88,* 123–135.

Tellegen, A., Watson, D., & Clark, L. A. (1999). On the dimensional and hierarchical structure of affect. *Psychological Science, 19,* 297–309.

Turner, J. C., Thorpe, P. K., & Meyer, D. K. (1998). Students' reports of motivation and negative affect: A theoretical and empirical analysis. *Journal of Educational Psychology, 90,* 758–771.

Turner, J. E., & Schallert, D. L. (2001). Expectancy-value relationships of shame reactions and shame resiliency. *Journal of Educational Psychology, 93,* 320–329.

Tyson, D. F., Linnenbrink-Garcia, L., & Hill, N. E. (2008, March). *Achievement goal orientations and emotional responses during standardized testing.* Paper presented at the annual meeting of the American Educational Research Association, New York.

Urdan, T. (2004). Predictors of academic self-handicapping and achievement: Examining achievement goals, classroom goal structures, and culture. *Journal of Educational Psychology, 96,* 251–264.

Vansteenkiste, M., Simons, J., Lens, W., Soenens, B., Matos, L., & Lacante, M. (2004). Less is sometimes more: Goal content matters. *Journal of Educational Psychology, 96,* 755–764.

Watson, D., & Clark, L. A. (1984). Negative affectivity: The disposition to experience aversive emotional states. *Psychologica1 Bulletin, 96,* 465–490.

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92,* 548–573.

Weiner, B. (2007). Examining emotional diversity in the classroom: An attribution theorist considers the moral emotions. In P. A. Schutz & R. Pekrun (Eds.), *Emotion in education* (pp. 75–88). San Diego, CA: Academic Press.

Wolters, C. A. (2004). Advancing achievement goal theory: Using goal structures and goal orientations to predict students' motivation, cognition, and achievement. *Journal of Educational Psychology, 96,* 236–250.

Wolters, C. A., Yu, S. L., & Pintrich, P. R. (1996). The relation between goal orientation and students' motivational beliefs and self-regulated learning. *Learning and Individual Differences, 6,* 211–238.

Zeidner, M. (1998). *Test anxiety: The state of the art.* New York: Plenum.

Zeidner, M. (2007). Test anxiety in educational contexts: Concepts, findings, and future directions. In P. A. Schutz & R. Pekrun (Eds.), *Emotion in education* (pp. 165–184). San Diego, CA: Academic Press.

Zusho, A., Pintrich, P. R., & Cortina, K. S. (2005). Motives, goals, and adaptive patterns of performance in Asian American and Anglo American students. *Learning and Individual Differences, 15,* 141–158.

AMERICAN PSYCHOLOGICAL ASSOCIATION
SUBSCRIPTION CLAIMS INFORMATION

Today's Date:_____

We provide this form to assist members, institutions, and nonmember individuals with any subscription problems. With the appropriate information we can begin a resolution. If you use the services of an agent, please do **NOT** duplicate claims through them and directly to us. **PLEASE PRINT CLEARLY AND IN INK IF POSSIBLE.**

PRINT FULL NAME OR KEY NAME OF INSTITUTION

ADDRESS

CITY   STATE/COUNTRY   ZIP

YOUR NAME AND PHONE NUMBER

MEMBER OR CUSTOMER NUMBER (MAY BE FOUND ON ANY PAST ISSUE LABEL)

DATE YOUR ORDER WAS MAILED (OR PHONED)

____PREPAID ____CHECK ____CHARGE
CHECK/CARD CLEARED DATE:_____

(If possible, send a copy, front and back, of your cancelled check to help us in our research of your claim.)

ISSUES: ____ MISSING ____ DAMAGED

TITLE	VOLUME OR YEAR	NUMBER OR MONTH

Thank you. Once a claim is received and resolved, delivery of replacement issues routinely takes 4–6 weeks.

============ (TO BE FILLED OUT BY APA STAFF) ============

DATE RECEIVED: _____   DATE OF ACTION: _____
ACTION TAKEN: _____   INV. NO. & DATE: _____
STAFF NAME: _____   LABEL NO. & DATE: _____

Send this form to APA Subscription Claims, 750 First Street, NE, Washington, DC 20002-4242

PLEASE DO NOT REMOVE. A PHOTOCOPY MAY BE USED.