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A 3 × 2 Achievement Goal Model

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In the present research, a 3 × 2 model of achievement goals is proposed and tested. The model is rooted in the definition and valence components of competence, and encompasses 6 goal constructs: task-approach, task-avoidance, self-approach, self-avoidance, other-approach, and other-avoidance. The results from 2 studies provided strong support for the proposed model, most notably the need to separate task-based and self-based goals. Studies 1 and 2 yielded data establishing the 3 × 2 structure of achievement goals, and Study 2 documented the antecedents and consequences of each of the goals in the 3 × 2 model. Terminological, conceptual, and applied issues pertaining to the 3 × 2 model are discussed.

Keywords: achievement, goal, motivation, competence

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For over three decades, the study of achievement goals has been an important focus of the achievement motivation literature. Several different conceptual models of achievement goals have been developed during this time, and applying these models in both laboratory and real-world contexts has taught us much about achievement motivation and its consequences. In the present research, we offer a 3 × 2 achievement goal model designed to both extend and clarify the study of achievement goals. We begin by laying out a historical overview of conceptual work on achievement goals and proceed to articulate the need for and nature of the 3 × 2 achievement goal model.

Conceptual Context

The achievement goal construct was developed in the late 1970s and early 1980s in independent and collaborative work by Carole Ames (1984), Carol Dweck (1986), Marty Maehr (Maehr & Nicholls, 1980), and John Nicholls (1984). Each of these theorists distinguished between two qualitatively distinct goals for achievement behavior, and the conceptualizations they offered were similar enough to be referred to together as "the dichotomous achievement goal model." In this model, *achievement goal* is defined as the purpose for engaging in achievement behavior (Maehr, 1989), and the two goal types delineated are *mastery goals*, in which the purpose is to develop competence and task mastery, and *performance goals*, in which the purpose is to demonstrate competence (usually normative competence). Both mastery and performance goals are construed as approach goals (Ames, 1992; Nicholls, Patashnick, Cheung, Thorkildsen, & Lauer, 1989), and the two goals are posited to have different nomological networks.

In the 1990s and 2000s, Elliot and colleagues proposed a set of achievement goal models that extended the dichotomous model through the incorporation of avoidance, as well as approach, goals. In the trichotomous achievement goal model (Elliot & Harackiewicz, 1996), the performance goal construct is bifurcated by approach-avoidance, leading to three separate goals: mastery, performance-approach, and performance-avoidance. In the 2 × 2 achievement goal model (Elliot, 1999), the mastery goal construct is also bifurcated by approach-avoidance, and a fourth goal is added to the trichotomy: mastery-avoidance. Each of the goals in these models is posited to have a distinct pattern of antecedents and consequences.

In addition to incorporating the approach-avoidance distinction, Elliot and colleagues also revised the achievement goal construct by offering a more precise definition grounded in competence alone. Elliot (1999; see also Elliot & Thrash, 2001) noted that defining achievement goal in terms of "purpose" lacks precision, because purpose has two different denotations: "the reason for which something exists or is done" and "an intended or desired result; end; aim; goal" (*Random House Dictionary of the English Language, Unabridged*, 1993). Purpose is used in both of these ways in the dichotomous conceptualization of achievement goal: the reason for engaging in achievement behavior (to develop or demonstrate competence) is typically included, and sometimes the aim that is pursued while engaging in achievement behavior (objective/intrapersonal or normative competence) is also included. Importantly, the reason aspect of purpose includes competence but also includes additional content beyond competence (e.g., "demonstrate" in the performance goal construct implicates approval and/or self-presentation, as well as competence per se); the aim aspect of purpose focuses on competence alone (Elliot, 2006; Urdan & Mestas, 2006).

In their trichotomous and 2 × 2 achievement goal models, Elliot and colleagues explicitly separated the reason and aim aspects of purpose and defined achievement goal in terms of aim alone, specifically, the competence-based aim used to guide behavior (see Elliot, 1999; Elliot & Fryer, 2008, for the rationale for focusing on

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aim in defining the goal construct; see Kaplan & Maehr, 2007, for coverage of alternative perspectives).[1] Competence may be defined in terms of the standard used in evaluation, that is, the referent used to determine if one is doing well or poorly, and three basic evaluative standards may be identified—task, self, and other. The goals of the trichotomous and 2 × 2 achievement goal models are conceptualized on this basis: a mastery-approach goal focused on the attainment of task-based or self-based competence, a mastery-avoidance goal focused on the avoidance of task-based or self-based incompetence, a performance-approach goal focused on the attainment of other-based competence, and a performance-avoidance focused on the avoidance of other-based incompetence. When achievement goals are conceptualized in this manner, it becomes clear that mastery-based goals contain two different standards for evaluation: task-based competence and self-based competence. This raises the question of whether these two standards are similar enough to belong in a single goal construct or are different enough to warrant separate goal constructs.

Competence Defined: Task-Based, Self-Based, and Other-Based Achievement Goals

Herein we argue for the separation of task-based and self-based goals and, accordingly, posit a separate type of goal construct for each of the three standards used in competence evaluation: task, self, and other. In the following, we define each of the three goal types and then compare and contrast them, focusing first and foremost on the question of the separation of task-based and self-based goals.

Task-based goals use the absolute demands of the task (e.g., getting an answer correct, understanding an idea) as the evaluative referent. Thus, for these goals, competence is defined in terms of doing well or poorly relative to what the task itself requires. Self-based goals use one's own intrapersonal trajectory as the evaluative referent. Thus, for these goals, competence is defined in terms of doing well or poorly relative to how one has done in the past or has the potential to do in the future. Other-based goals use an interpersonal evaluative referent. Thus, for these goals, competence is defined in terms of doing well or poorly relative to others.

It is easy to understand why task-and self-based goals have been considered together under a single rubric (i.e., mastery goal) to date. In daily life, task- and self-based strivings are often commingled. For example, the task-based goal of understanding new course material and the self-based goal of expanding one's knowledge base are clearly closely intertwined. Conceptually, task- and self-based goals are similar in that both have an evaluative standard that may be used privately and at one's own discretion in the acquisition of competence information. These conceptual similarities likely promote somewhat similar processes during goal regulation.

Upon closer examination, however, one can see why it may be best to consider task- and self-based goals separately. There are many instances in daily life in which task- and self-based goals may be pursued independently. For example, a person working on a crossword puzzle may simply be striving to find all of the words in the puzzle without considering his or her prior puzzle-solving experiences; alternatively, a person may be trying to find more words in today's crossword puzzle than in yesterday's puzzle without focusing on finding all of the words in the puzzle. Furthermore, with regard to the more detailed mechanics of goal regulation, task- and self-based goals are different in several respects.

The use of a task-based standard in regulation is extremely straightforward, as it simply requires the ability to cognitively represent a task, and to discern the degree to which one has accomplished the task or not. A rudimentary form of task-based striving may be seen in infants' attempts to have an effect on objects they encounter in their environment (White, 1959); with greater cognitive capacity, individuals are able to represent tasks in a more clear and complex manner and to engage in more deliberate and precise evaluation of behavioral accomplishments relative to task demands (Barrett & Morgan, 1995; Elliot, McGregor, & Thrash, 2002). Given that the standard for evaluating competence is inherent in the task itself, an individual can receive feedback in direct, immediate, and ongoing fashion during task engagement. This gives this form of regulation a very process-oriented, flow-like (Csikszentmihalyi, 1990) quality and enables one to remain absorbed in the task, even as one receives continuous, online competence information. The self-concept is not salient in such striving, as one's attention remains task-focused and, experientially, the "I" is simply trying to accomplish what the task requires. As such, this form of striving is likely to be optimal for the phenomenological experience of regulation.

The use of a self-based standard, on the other hand, is more complicated and requires more cognitive capacity than the use of a task-based standard. Even in its simplest form, self-based regulation requires the ability to cognitively represent two outcomes simultaneously (one of which is not present), and to evaluate the outcomes in terms of temporal sequence. Children do not appear able to utilize this more complex form of regulation until after 5 years of age (Butler, 1998; Ruble, Eisenberg, & Higgins, 1994). Self-based striving utilizes what would appear to be a perfectly calibrated, optimally challenging comparison target for competence evaluation: one's personal performance trajectory. However, the complexity of the comparison involved in this form of striving (i.e., the use of abstract information separate from ongoing task engagement) likely makes regulation less process-oriented and flow-like than is the case for task-based striving. Furthermore, using self-information as the hub of regulation may make the "me" more salient and open the door for self-worth and self-presentation concerns to infiltrate the ongoing feedback process. As such, this form of striving may not be as ideal for the phenomenological experience of regulation as task-based striving.

With regard to other-based goals, the use of an interpersonal standard varies in complexity as a function of whether the comparison other is concrete and present in the achievement situation (as in face-to-face competition) or consists of aggregate normative information. In the former case, interpersonal comparison requires the ability to cognitively represent and compare two concrete outcomes, which is only moderately more complex than task-based comparison; in the latter, more frequent case, interpersonal com-

[1] This separation of reason and aim was not present in the initial articulation of the trichotomous model (Elliot & Harackiewicz, 1996) but was implemented shortly thereafter (Elliot, 1999). For additional detail on aims, reasons, and their interrelation, see the general discussion material on "goal complexes."

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parison requires the representation and utilization of a more abstract evaluative referent, which seems similar in complexity to self-based comparison. Developmental data indicate that children as early as age 3–4 years understand the concept of simple competition and regulate accordingly (Butler, 1998; Jennings, 1993), but children do not seem to utilize abstract normative information in competence evaluation until at least a year or two later (Jennings, 1993; Stipek & Mac Iver, 1989). In simple competition, competence feedback may be acquired quite directly during the process of task engagement, but when utilizing a more abstract normative standard, competence feedback must be received separately, at another person's discretion, and often after considerable delay. Indeed, in most forms of other-based striving, competence information is received from another individual (i.e., publically), and the normative standard of evaluation is not typically calibrated to provide optimal challenge (Nicholls, 1989). Nevertheless, other-based goal pursuit yields highly diagnostic, self-relevant competence information that often has instrumental implications. As such, although this form of striving may not be as ideal for the phenomenological experience of regulation as task-based (or even self-based) goals, it may be particularly likely to impact the efficiency and effectiveness of task engagement.

Competence Valenced: Approach-Based and Avoidance-Based Goals

Competence, and therefore achievement goals, may be differentiated on two fundamental components: how it is *defined* and how it is *valenced* (Elliot & McGregor, 2001). To this point, we have focused exclusively on the definition component, but the valence component is equally important and basic. Competence is valenced in that it is either conceptualized as a positive, desirable possibility (i.e., success) or a negative, undesirable possibility (i.e., failure); positive and negative possibilities have been shown to be integrally linked to approach and avoidance tendencies, respectively (Cacioppo, Priester, & Berntson, 1993; Lang, 1995). This distinction between approaching success and avoiding failure has been central to the trichotomous (Elliot & Harackiewicz, 1996) and 2 × 2 achievement goal models (Elliot & McGregor, 2001) and, indeed, has been an important feature of models of achievement motivation since the inception of the literature (see Hoppe, 1930; Lewin, Dembo, Festinger, & Sears, 1944; McClelland, Atkinson, Clark, & Lowell, 1953; Murray, 1938).

Approach-based goals focus on success, and regulation entails trying to move toward or maintain this positive possibility. Using success as the hub of regulatory activity evokes and sustains hope, eagerness, and excitement, as one is consistently reminded of the possibility of success (Pekrun, Elliot, & Maier, 2006, 2009). These appetitive processes tend to promote a full commitment to and immersion in the task, and facilitate a broad and open approach to task engagement (for a review, see Elliot, 1999). Avoidance-based goals, on the other hand, focus on failure, and regulation entails trying to move away or keep away from this negative possibility. Using failure as the hub of regulation evokes and perpetuates threat, anxiety, and vigilance, as one is repeatedly reminded of the possibility of failure (Pekrun et al., 2006, 2009). These aversive processes tend to prompt self-worth concerns that preclude full investment and interfere with attention to the task; cognitive activity in the service of failure avoidance tends to be quite rigid and restricted in scope (for a review, see Elliot, 1999). Avoidance-based goal pursuit may be optimally suited for some tasks (e.g., those requiring error detection such as auditing or proof-texting), but in general, approach-based goal pursuit is much more pleasant phenomenologically and is better suited to facilitate efficient and effective task engagement (Elliot, Shell, Henry, & Maier, 2005).

The 3 × 2 Model of Achievement Goals and the Present Research

Definition and valence are integral components of achievement goal constructs. Crossing the three standards used to define competence with the two ways that competence may be valenced yields a 3 × 2 achievement goal model (see Figure 1). This model is composed of the following goals: a *task-approach goal* focused on the attainment of task-based competence (e.g., "Do the task correctly"), a *task-avoidance goal* focused on the avoidance of task-based incompetence (e.g., "Avoid doing the task incorrectly"), a *self-approach goal* focused on the attainment of self-based competence (e.g., "Do better than before"), a *self-avoidance goal* focused on the avoidance of self-based incompetence (e.g., Avoid doing worse than before"), an *other-approach goal* focused on the attainment of other-based competence (e.g., "Do better than others"), and an *other-avoidance goal* focused on the avoidance of other-based incompetence (e.g., "Avoid doing worse than others"). This 3 × 2 standards-based model is derived from the 2 × 2 mastery–performance model but is also construed as a distinct framework, separate from the mastery–performance distinction. It is the 3 × 2 model that we examine in the present research.

Specifically, the present research comprises two studies designed to investigate the structural validity (Messick, 1995) of the 3 × 2 model (Studies 1 and 2) and to examine links between the six goals in the model and antecedent and consequence variables that have been shown to be conceptually and empirically important in prior work on achievement goals and motivation more generally (Study 2). With regard to structural validity, we sought to test whether the six goals represent empirically distinct constructs and whether the 3 × 2 model affords a better fit to the data than a series of alternative models, including the 2 × 2, trichotomous, and

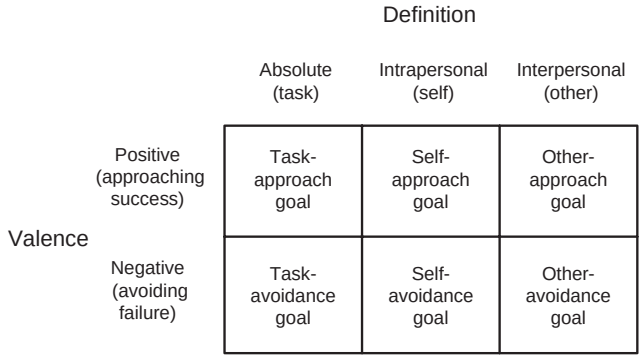

Figure 1. The 3 × 2 achievement goal model. Definition and valence represent the two dimensions of competence. Absolute, intrapersonal, and interpersonal represent the three ways that competence may be defined; positive and negative represent the two ways that competence may be valenced.

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dichotomous models. If task- and self-based goals are inseparable, then a model other than the 3 × 2 model, such as the 2 × 2 model, would be supported. However, given the aforementioned differences between task- and self-based goals in evaluative standard and mechanics of goal regulation, we anticipated that the data would support separation of these goals and, accordingly, support expansion to a 3 × 2 achievement goal model. With regard to antecedents and consequences, we based our predictions not only on the referential and regulatory differences between task- and self-based goals but also on the extant empirical patterns from the 2 × 2 and trichotomous achievement goals models (other-based goals are a direct analog of performance-based goals, task-approach and self-approach goals are analogous to different aspects of an omnibus mastery-approach goal, and task-avoidance and self-avoidance goals are analogous to different aspects of an omnibus mastery-avoidance goal).

For antecedents, we examined approach and avoidance temperaments as simultaneous predictors of each of the goals in the 3 × 2 model. Approach and avoidance temperaments represent general, biologically based sensitivities to positive and negative stimuli (encountered or envisioned) that are accompanied by a perceptual vigilance for, an affective reactivity to, and a behavioral predisposition toward such stimuli. These temperaments orient individuals to valenced possibilities and do so in a rigid, reactive manner across situations (for further information on the nature and function of these temperaments and their importance in models of motivation, see Elliot, 2006). Goals complement temperaments by providing directionality and flexibility in the self-regulation process. That is, individuals may adopt goals of the same valence as their underlying temperaments, thereby affording more precise guidance for action (i.e., valence match), but they may also adopt goals of the opposite valence as their temperaments, thereby redirecting their initial inclinations (i.e., valence override). On the basis of prior research, we predicted a valence match for temperaments and goals, such that approach temperament positively predicts the adoption of approach-based achievement goals (task-approach, self-approach, and other-approach), and avoidance temperament positively predicts the adoption of avoidance-based achievement goals (task-avoidance, self-avoidance, and other-avoidance; see Elliot & Thrash, 2002, 2010). Also on the basis of prior research, we predicted that avoidance temperament would positively predict the adoption of other-approach goals, a valence override process whereby individuals seek to redirect their general avoidance tendency toward an approach form of regulation (see Elliot & Thrash, 2002). No other temperament-goal links are predicted, meaning we anticipated that task-based and self-based achievement goals would emerge from the same antecedents, and we had no a priori expectations regarding the possibility of additional valence override processes (e.g., avoidance temperament as a positive predictor of self-approach goals).

In terms of consequences, we examined the goals of the 3 × 2 model as simultaneous prospective predictors of several different achievement-relevant variables that had been shown to be important in prior achievement goal research (see Dweck, 1999; Hulleman, Schrager, Bodmann, & Harackiewicz, 2010; Kaplan & Maehr, 2007; Pintrich & Schunk, 1996); these variables included performance attainment and intrinsic motivation, arguably the most central dependent variables in the achievement goal nomological network, as well as other focal variables—learning efficacy, worry about exams, and absorption (i.e., cognitive immersion) during class. We also focused on a variable that had yet to receive direct attention in achievement goal research, energy during class. Energization is a core component of motivation (Thayer, 1986) and represents an important affective component of student engagement (i.e., how lively, active, energetic the student feels in class). As such, it would seem an important variable to include in the achievement goal nomological network.

For performance attainment, we predicted that other-approach goals would be a positive predictor and other-avoidance goals a negative predictor (see Darnon, Butera, Mugny, Quiamzade, & Hulleman, 2009; Elliot & Church, 1997; Sideridis, 2005; Vallerand et al., 2007); neither task-approach nor self-approach goals were expected to significantly predict performance attainment (omnibus mastery-approach goals are not consistent predictors of performance, see Harackiewicz, Barron, Pintrich, Elliot, & Thrash, 2002; Midgley, Kaplan, & Middleton, 2001; Senko & Miles, 2008). Predictions for task-avoidance and self-avoidance goals are not offered a priori for this or any other dependent variable, given the difficulty in anticipating how the task and self components of these goals combine with the avoidance component in the process of goal regulation (Elliot & McGregor, 2001), as well as the minimal empirical yield to date for omnibus mastery-avoidance goals. For intrinsic motivation, we predicted that task-approach goals would be a positive predictor (see Church, Elliot, & Gable, 2001; Lee, Sheldon, & Turban, 2003; Zusho, Pintrich, & Cortina, 2005) but that self-approach goals would be a weaker positive predictor or even unrelated, given their more complex, less process-oriented nature. Other-avoidance and other-approach goals were predicted to be negative and null predictors of intrinsic motivation, respectively (see Day, Radosevich, & Chasteen, 2003; Elliot & Harackiewicz, 1996; Van Yperen, 2006).

For learning efficacy, we predicted that other-approach goals would be a positive predictor and other-avoidance goals a negative predictor, as these are the patterns commonly found for perceived competence-based variables (see Cury, Da Fonseca, Rufo, & Sarrazin, 2002; Smith, Duda, Allen, & Hall, 2002); given the focus on learning in this variable, we anticipated that task-approach, and perhaps self-approach goals as well, would be a positive predictor (see Pajares, Britner, & Valiante, 2000; Zweig & Webster, 2004). For worry about exams, we predicted that other-avoidance goals would be a positive predictor, whereas the rest of the goals would be unrelated (see Brodish & Devine, 2009; Elliot & McGregor, 1999; Sideridis, 2008). For absorption during class, our predictions were identical to those for intrinsic motivation, for the same reasons articulated therein (see Cury, Elliot, Sarrazin, Da Fonseca, & Rufo, 2002; McGregor & Elliot, 2002). For energy during class, we tentatively predicted that the positive focus of the three approach goals would facilitate and sustain energy and vitality in the classroom (there is no prior research on which to draw here). All antecedent and consequence results were expected to be robust with regard to various control variables such as Scholastic Aptitude Test (SAT) scores and response bias.

Study 1

In Study 1, we created items to assess each of the six goals in the 3 × 2 achievement goal model, had undergraduates complete the items with regard to their exams for a particular course, and

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examined the fit of the data to the hypothesized and alternative models. All of the achievement goal items focused explicitly on the task of taking an exam, rather than the task of learning exam-relevant material. In prior research, the tasks of performing and learning have been an implicit part of the distinction between performance and mastery goals, respectively; in contrast, in the 3 × 2 model, the standards of competence evaluation are equally applicable to each type of task. As such, it is possible to conduct a more precise analysis of the 3 × 2 goals per se, separate from the type of task.

Method

Participants, achievement context, and procedure. A total of 126 (22 male and 104 female) undergraduates in an introductory level psychology class in Germany voluntarily participated in the study. The class was conducted in lecture format, and evaluation was based on an absolute grading structure (e.g., at or above 90% of the total possible points was an A). Eight weeks into the course, participants completed the achievement goal questionnaire and a demographics questionnaire in a group session. Participants were assured that all of their responses would remain confidential and would not influence their course grade.

The 3 × 2 Achievement Goal Questionnaire (AGQ). A series of pilot studies was conducted prior to the research reported herein. The aim of the pilot work was to devise and ultimately select items to form brief but reliable and face-valid indexes of each of the six goals in the 3 × 2 achievement goal framework. A pool of items was generated to correspond to each of the goal constructs, and a variety of different item sets were tested on several different undergraduate samples. At the completion of the pilot work, three items were chosen to represent each achievement goal for use in Study 1; these items are presented in the Appendix. The items were translated and back-translated for use in the German language. Participants were informed that they would be shown statements that represent types of goals that they may or may not have for their psychology class, and they were instructed to indicate how true each statement was of them on a 1 (*not true of me*) to 7 (*extremely true of me*) scale.

Results and Discussion

Confirmatory factor analysis (CFA), descriptive statistics, internal consistencies, and intercorrelations. A CFA was conducted on the achievement goal items. The analysis was conducted on a covariance matrix, and the solution was generated on the basis of maximum-likelihood estimation. The CFA examined the hypothesized model, which designated that the items for each goal load on their respective latent factors. To identify the model, the variance of each latent factor was fixed to 1 (Bollen, 1989). As recommended by Hoyle and Panter (1995), we used several different indices to evaluate the fit of the model to the data, including the comparative fit index (CFI), Tucker–Lewis index (TLI), and root-mean-square error of approximation (RMSEA). The following criteria were used to evaluate the adequacy of model fit: CFI ≥ .90, TLI ≥ .90, and RMSEA ≤ .08 (Browne & Cudeck, 1993).

The results from the analysis strongly supported the hypothesized model. All standardized factor loadings were moderate to strong (ranging from .52 to .95), and each fit statistic met the criteria for a good fitting model: $\chi^2(120, N = 126) = 194.25$, $p < .01$, CFI = .95, TLI = .94, RMSEA = .070. Each of the achievement goals demonstrated a high level of reliability; Table 1 provides the descriptive statistics and internal consistencies of the achievement goal variables. The lower diagonal of Table 2 provides the intercorrelations among the achievement goal variables.

Comparison with alternative models. Additional analyses were conducted to compare the fit of the hypothesized model with a series of alternative models. Ten alternative models were tested: (a) a *2 × 2* model, in which the other-based goals load on their hypothesized latent factors, but the like-valenced task-based and self-based goals load together on joint latent factors; (b) a *Trichotomous* model, in which the other-based goals load together on their hypothesized latent factors, but the task-based and self-based goals load together on a joint latent factor; (c) a *Dichotomous* model, in which the other-based goals load together on a joint latent factor and the task-based and self-based goals load together on another joint latent factor; (d) a *Tap/Tav* (task-approach/task-avoidance) model, in which all items load on their hypothesized latent factors, except the task-approach and task-avoidance items load together on a joint latent factor; (e) a *Sap/Sav* (self-approach/self-avoidance) model, in which all items load on their hypothesized latent factors, except the self-approach and self-avoidance items load together on a joint latent factor; (f) an *Oap/Oav* (other-approach/other-avoidance) model, in which all items load on their hypothesized latent factors, except the other-approach and other-avoidance items load together on a joint latent factor; (g) an *Approach* model, in which all avoidance-based items load on their hypothesized latent factors, but all approach-based items load together on a joint latent factor; (h) an *Avoidance* model, in which all approach-based items load on their hypothesized latent factors, but all avoidance-based items load together on a joint latent factor; (i) a *Definition* model, in which all items sharing a competence definition load together on joint latent factors; and (j) a *Valence* model, in which all items with a shared valence load together on joint latent factors. We used the chi-square difference test, the Akaike information criterion (AIC), and the Browne-Cudeck criterion (BCC) to compare the hypothesized model with the alternative models (Kline, 1998). A chi-square difference value for an alternative model that is significantly larger than zero indicates that the alternative model provides a worse fit to the data than the hypothesized model; lower AIC and BCC values indicate better fit. As can be seen in Table 3, the model comparisons indicated that the hypothesized model provided a better fit to the data than any of the alternative models.

In sum, the results of this study provide clear support for the separation of task-based and self-based goals and the 3 × 2 achievement goal model more generally.

Table 1
Study 1: Descriptive Statistics and Internal Consistencies

Variable	*M*	*SD*	Observed range	Cronbach's α
Task-approach goals	6.24	0.69	4.00–7.00	.84
Task-avoidance goals	6.02	0.91	2.00–7.00	.80
Self-approach goals	4.70	1.30	1.00–7.00	.77
Self-avoidance goals	5.32	1.24	1.00–7.00	.83
Other-approach goals	3.92	1.44	1.00–7.00	.93
Other-avoidance goals	4.19	1.51	1.00–7.00	.91

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Table 2
Intercorrelations Among the Achievement Goal Variables

Variable	1	2	3	4	5	6
1. Task-approach goals	—	.70**	.43**	.45**	.40**	.39**
2. Task-avoidance goals	.68**	—	.42**	.62**	.39**	.50**
3. Self-approach goals	.29**	.21*	—	.77**	.26**	.34**
4. Self-avoidance goals	.37**	.49**	.56**	—	.30**	.47**
5. Other-approach goals	.14	.17	.14	.26**	—	.79**
6. Other-avoidance goals	.12	.27**	.10	.30**	.83**	—

Note. Values below the diagonal are from Study 1; values above the diagonal are from Study 2.
* $p < .05$. ** $p < .01$.

Study 2

In Study 2, we again had undergraduate participants complete the 3 × 2 AGQ items for their exams in a particular course and examined the fit of the data to the hypothesized and alternative models. The students in this study were from the United States, rather than Germany. In addition to examining the structure of the achievement goal data, we investigated antecedents and consequences of the goals (see the end of the introduction section for predictions).

Method

Participants, achievement context, and procedure. A total of 319 (206 male and 113 female) undergraduates in an introductory level psychology class in the United States participated in the study for extra credit.[2] The class was conducted in lecture format, and evaluation was based on a normative grading structure. On the first day of the semester, participants completed a temperament measure and a demographics questionnaire. On the ninth day of the semester, participants completed a response bias measure. Participants' achievement goals for the class were assessed on the 12th day of the semester. At the midpoint of the semester, approximately 7 weeks after reporting their achievement goals, participants completed a questionnaire containing the dependent measures, excepting the exam performance measure. Exam performance data was acquired from course records, and SAT scores were acquired from the university registrar. Participants were assured that all of their responses would remain confidential and would not influence their course grade.

Measures.

Temperament. Elliot and Thrash's (2010) Approach-Avoidance Temperament Questionnaire was used to assess approach temperament (e.g., "It doesn't take a lot to get me excited and motivated") and avoidance temperament (e.g., "It is easy for me to imagine bad things that might happen to me"); each temperament is assessed with six items. Participants responded on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale, and their responses were averaged to form the approach temperament and avoidance temperament indexes.

Achievement goals. The 3 × 2 AGQ from Study 1 was used to assess achievement goals.

Exam performance. Three exams were administered in the class, each of which consisted of multiple choice, fill-in-the-blank, and short-answer questions. An exam performance index was created by summing participants' scores on all questions across the three exams.

Intrinsic motivation. Elliot and Harackiewicz's (1996) eight-item Intrinsic Motivation Scale was used to assess intrinsic motivation for the class (e.g., "I think this class is interesting"). Participants responded on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale, and scores were averaged to form the intrinsic motivation index.

Learning efficacy. Midgley et al.'s (2000) five-item Academic Efficacy scale was used to assess learning efficacy (e.g., "I can understand even the hardest material in this class if I try"). Participants responded on a 1 (*not at all true of me*) to 7 (*very true of me*) scale, and scores were averaged to form the learning efficacy index.

Worry about exams. Morris, Davis, and Hutchings's (1981) five-item worry scale from the Revised Worry-Emotionality Scale was used to assess participants' worrying about the exams in the class (e.g., "I feel that I may not do as well on this exam as I could"). Participants responded on a 1 (*does not describe my condition right now*) to 5 (*describes my condition right now very well*) scale, and scores were averaged to form the worry index.

Absorption in class. The six task-absorption items used in Elliot and Harackiewicz (1996) were used to assess absorption in class (e.g., "In this class, I am totally absorbed in the lecture"). These items are typically used with references to a particular task (Cury, Elliot, et al., 2002; Thrash & Elliot, 2004); here they are used with reference to the class. Participants responded on a 1 (*not at all true of me*) to 7 (*very true of me*) scale, and scores were averaged to form the absorption in class index.

Energy in class. The five-item Energy scale from Thayer's (1986) Activation-Deactivation Adjective Checklist was used to assess energy in class (e.g., "In this class, I feel energetic"). These items are typically used with references to a particular task (see Lichtenfeld, Maier, Elliot, & Pekrun, 2009; Thayer, 1989); here they are used with reference to the class. Participants responded on a 1 (*not at all true of me*) to 7 (*very true of me*) scale, and scores were averaged to form the energy in class index.

SAT scores. Participants' SAT verbal scores were used as an indicator of general ability.

Response bias. The 20-item Impression Management scale from Paulhus's (1991) Balanced Inventory of Desirable Responding was used to assess response bias. Participants respond to each item using a 1 (*not true*) to 7 (*very true*) scale. Half of the items represent desirable statements (e.g., "I always obey laws, even if I'm unlikely to get caught"), and half represent undesirable statements (e.g., "When I was young I sometimes stole things"). After reverse scoring the undesirable statements, participants received one point for each extreme (6 or 7) response, and their scores were averaged to form the response bias index.

Results

CFA, descriptive statistics, internal consistencies, and intercorrelations. The same CFA conducted in Study 1 was conducted in this study, and the results from the analysis strongly

[2] At the end of the study, two persons responded "not at all true" when asked if they read the questions in the assessments carefully and answered them honestly. These individuals were not included in the study.

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Table 3
Study 1: Comparison of the Hypothesized Model and Alternative Models

Model	$\chi^2(N = 126)$	*df*	CFI	TLI	RMSEA	$\Delta\chi^2(N = 126)$	AIC	BCC
3 × 2 model (baseline model)	192.71**	120	.95	.94	.070		330.71	355.44
2 × 2 model	420.38**	129	.81	.78	.134	227.68**	540.38	561.89
Trichotomous model	464.49**	132	.78	.75	.142	271.79**	578.49	598.93
Dichotomous model	507.70**	134	.76	.72	.149	315.00**	617.70	637.42
Tap/Tav model	241.15**	125	.92	.91	.086	48.44**	369.15	392.10
Sap/Sav model	245.07**	125	.92	.90	.088	52.36**	373.07	396.01
Oap/Oav model	245.84**	125	.92	.90	.088	53.15**	373.84	396.79
Approach model	595.43**	129	.69	.64	.170	402.72**	715.43	736.94
Avoidance model	616.56**	129	.68	.62	.174	423.85**	736.56	758.07
Definition model	330.53**	132	.87	.85	.110	137.82**	444.53	464.96
Valence model	880.31**	134	.52	.45	.211	685.61**	988.31	1,008.03

Note. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation; AIC = Akaike information criterion; BCC = Browne-Cudeck criterion; Tap/Tav = task-approach/task-avoidance; Sap/Sav = self-approach/self-avoidance; Oap/Oav = other-approach/other-avoidance.
** $p < .01$.

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supported the hypothesized model. All standardized factor loadings were moderate to strong (ranging from .71 to .95), and each fit statistic met the criteria for a good fitting model, $\chi^2(120, N = 317) = 229.97$, $p < .01$, CFI = .98, TLI = .97, RMSEA = .054. As in Study 1, each of the achievement goals demonstrated a high level of reliability; Table 4 provides the descriptive statistics and internal consistencies of the achievement goal variables, as well as the other study variables.

Approach and avoidance temperament were correlated at $r = .14$ ($p < .05$). The upper diagonal of Table 4 provides the intercorrelations among the achievement goal variables. The intercorrelations among the dependent variables ranged from –.30 ($p < .01$, for worry and exam performance) to .52 ($p < .01$, for absorption in class and intrinsic motivation).

Comparison with alternative models. As in Study 1, additional analyses were conducted to compare the fit of the hypothesized model with a series of 10 alternative models. Again, we used the chi-square difference test, the AIC, and the BCC to evaluate the relative fit of the 3 × 2 model with the alternative models. As can be seen in Table 5, the model comparisons indicated that the hypothesized model provided a better fit to the data than any of the alternative models.

Table 4
Study 2: Descriptive Statistics and Internal Consistencies

Variable	*M*	*SD*	Observed range	Cronbach's α
Task-approach goals	6.28	0.83	1.33–7.00	.88
Task-avoidance goals	5.90	1.09	1.00–7.00	.86
Self-approach goals	5.71	1.19	1.00–7.00	.83
Self-avoidance goals	5.67	1.24	1.00–7.00	.87
Other-approach goals	4.99	1.41	1.00–7.00	.92
Other-avoidance goals	5.17	1.37	1.00–7.00	.91
Approach temperament	5.20	0.92	2.00–7.00	.85
Avoidance temperament	4.28	1.31	1.00–7.00	.85
Exam performance	78.16	12.86	11.5–98.5	.87
Intrinsic motivation	5.55	0.97	1.63–7.00	.86
Learning efficacy	5.84	1.02	1.20–7.00	.93
Worry about exams	3.59	1.37	1.00–7.00	.86
Absorption in class	4.60	0.89	2.00–7.00	.70
Energy in class	3.09	1.35	1.00–7.00	.94
SAT score	631.00	75.10	420–800	
Response bias	5.37	3.20	0–17	.71

Note. SAT = Scholastic Aptitude Test.

Antecedent analyses: Temperament as a predictor of achievement goals. Simultaneous multiple regression analyses were used to examine temperament as a predictor of achievement goals. The basic model for the analyses consisted of the approach and avoidance temperament variables. Sex main and interactive effects were examined in preliminary analyses, and any sex effects that attained significance were included in the final analysis (Judd & Kenny, 1981).

Separate regression analyses were conducted to predict each of the six achievement goals, and the following results were revealed. Approach temperament was a positive predictor of task-approach goals, $F(1, 314) = 11.03$, $p < .01$, $\beta = .19$, whereas avoidance temperament was unrelated to these goals ($\beta = .02$, $p = .74$). Both approach temperament, $F(1, 314) = 5.98$, $p < .05$, $\beta = .14$, and avoidance temperament, $F(1, 314) = 7.10$, $p < .01$, $\beta = .15$, were positive predictors of task-avoidance goals. For self-approach goals, approach temperament was a positive predictor, $F(1, 314) = 6.64$, $p < .01$, $\beta = .14$, whereas avoidance temperament was unrelated ($\beta = .09$, $p = .11$). For self-avoidance goals, avoidance temperament was a positive predictor, $F(1, 314) = 7.13$, $p < .01$, $\beta = .15$, and approach temperament exhibited a positive trend ($\beta = .10$, $p = .064$). Both approach temperament, $F(1, 314) = 4.06$, $p < .05$, $\beta = .11$, and avoidance temperament, $F(1, 314) = 4.82$, $p < .05$, $\beta = .12$, were positive predictors of other-approach goals. Only avoidance temperament was a positive predictor of other-avoidance goals, $F(1, 314) = 12.75$, $p < .01$, $\beta = .16$; approach temperament was unrelated ($\beta = .07$, $p = .20$).

Consequence analyses: Achievement goals as predictor variables. Simultaneous multiple regression analyses were used to examine achievement goals as predictors of the dependent measures. The basic model for the analyses consisted of the six achievement goals; preliminary analyses included sex and sex interactions, which were retained in the final model when significant. Preliminary analyses also indicated that the variance inflation factor for the achievement goal variables ranged from 2.18 to 3.60 (far below the conventional cutoff criteria of 10; Kutner,

Table 5
Study 2: Comparison of the Hypothesized Model and Alternative Models

Model	$\chi^2(N = 317)$	*df*	CFI	TLI	RMSEA	$\Delta\chi^2(N = 317)$	AIC	BCC
3 × 2 model (baseline model)	229.97**	120	.98	.97	.054		367.97	376.80
2 × 2 model	908.47**	129	.82	.79	.138	678.50**	1,028.47	1,036.14
Trichotomous model	978.70**	132	.81	.78	.142	748.73**	1,092.70	1,009.99
Dichotomous model	1,147.50**	134	.77	.74	.155	917.53**	1,257.50	1,264.54
Tap/Tav model	406.03**	125	.94	.92	.084	176.06**	534.03	542.22
Sap/Sav model	317.05**	125	.96	.95	.070	87.08**	445.05	453.23
Oap/Oav model	414.19**	125	.93	.92	.086	184.22**	542.19	550.387
Approach model	1,427.80**	129	.71	.65	.178	1,197.83**	1,547.80	1,555.48
Avoidance model	1,277.73**	129	.74	.69	.168	1,047.76**	1,397.73	1,405.41
Definition model	622.49**	132	.89	.87	.108	392.52**	736.49	743.79
Valence model	2,147.29**	134	.54	.48	.218	1,917.32**	2,257.29	2,264.33

Note. CFI = comparative fit index; TLI = Tucker–Lewis index; RMSEA = root-mean-square error of approximation; AIC = Akaike information criterion; BCC = Browne–Cudeck criterion; Tap/Tav = task-approach/task-avoidance; Sap/Sav = self-approach/self-avoidance; Oap/Oav = other-approach/other-avoidance.
** $p < .01$.

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Nachtsheim, & Neter, 2004), indicating that multicollinearity was not a problem in these data.

The regression of exam performance on the basic model revealed that other-approach goals were a positive predictor, $F(1, 303) = 17.28$, $p < .01$, $\beta = .37$, and other-avoidance goals were a negative predictor, $F(1, 303) = 4.90$, $p < .05$, $\beta = -.21$. Sex was also a positive predictor, $F(1, 303) = 8.21$, $p < .01$, $\beta = .15$, indicating that females performed better than males on the exams. No other results were significant.

Regressing intrinsic motivation on the basic model revealed that task-approach goals were a positive predictor, $F(1, 299) = 7.23$, $p < .01$, $\beta = .22$, whereas self-approach goals were unrelated ($\beta = -.01$, $p = .96$). Other-avoidance goals evidenced a negative trend in the predicted direction ($\beta = -.07$), but did not attain significance ($p = .51$). Sex was a positive predictor, $F(1, 299) = 9.69$, $p < .01$, $\beta = .18$, indicating that women enjoyed the class more than men. No other results were significant.

The regression of learning efficacy on the basic model revealed that task-approach, $F(1, 301) = 5.83$, $p < .05$, $\beta = .20$, and other-approach, $F(1, 301) = 6.69$, $p < .05$, $\beta = .25$, goals were positive predictors, whereas self-approach goals were unrelated ($\beta = -.04$, $p = .63$). Other-avoidance goals were a negative predictor, $F(1, 301) = 8.98$, $p < .01$, $\beta = -.31$. No other results were significant.

Regressing worry about exams on the basic model revealed that other-avoidance goals, $F(1, 300) = 8.52$, $p < .01$, $\beta = .30$, were a positive predictor. No other results were significant.

Regressing absorption in class on the basic model revealed that task-approach goals were a positive predictor, $F(1, 300) = 6.92$, $p < .01$, $\beta = .22$, whereas self-approach goals were unrelated ($\beta = -.07$, $p = .47$). Other-avoidance goals evidenced a negative trend in the predicted direction ($\beta = -.14$) but did not attain significance ($p = .17$). Sex was a positive predictor, $F(1, 300) = 4.87$, $p < .01$, $\beta = -.13$, indicating that women were more absorbed in the class than men. No other results were significant.

The regression of energy in class on the basic model revealed that self-approach goals were a positive predictor, $F(1, 300) = 7.99$, $p < .01$, $\beta = .26$, but task-approach goals were unrelated ($\beta = .00$, $p = .97$). Self-avoidance goals were a negative predictor, $F(1, 300) = 4.92$, $p < .01$, $\beta = -.24$, but task-avoidance goals were unrelated ($\beta = .09$, $p = .35$). No other results were significant.

Control variable analyses. In addition to the primary analyses, we repeated each analysis controlling for a variety of other variables that could influence the focal relations. For the temperament to goal analyses, we controlled for SAT scores and response bias (independently). As can be seen in Table 6, each of the significant findings from the primary analyses remained significant in these analyses, except for the effect of approach temperament on other-approach goals controlling for SAT scores (which became marginally significant).

For the goal to dependent variable analyses, we controlled for the following variables (independently): SAT scores, response bias, Exam 1 performance (excepting the exam performance anal-

Table 6
Study 2: Approach and Avoidance Temperament as Predictors of Achievement Goals

Variable	Task-approach goals	Task-avoidance goals	Self-approach goals	Self-avoidance goals	Other-approach goals	Other-avoidance goals
Approach temperament	.16**/.15**/.17**	.14*/.12*/.14**	.14*/.11*/.15**	.10/.08/.10	.11*/.10†/.13*	.07/.06/.09
Avoidance temperament	−.01/−.01/−.01	.15**/.15**/.15**	.09/.09/.09	.15**/.15**/.15**	.12*/.12*/.13*	.16*/.16**/.16**

Note. Tabled values are standardized coefficients from the regression equations. For each column and variable, the first value is from the initial analysis, the second value is from the analysis controlling for Scholastic Aptitude Test scores, and the third value is from the analysis controlling for response bias.
† $p < .10$. * $p < .05$. ** $p < .01$.

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ysis), and approach and avoidance temperament. As indicated in Table 7, each of the significant findings from the primary analyses remained significant in these analyses.

Alternative achievement goal models. As noted earlier, prior work utilizing the 2 × 2 achievement goal model has essentially collapsed together task- and self-based goals under the "mastery goal" rubric. To facilitate comparison of the present findings to prior work, we conducted ancillary analyses using a 2 × 2 model in which the like-valenced task-based and self-based variables were combined.

The results for the antecedent analyses are as follows. Approach temperament was a positive predictor of task-/self-approach goals combined, $F(1, 313) = 9.00$, $p < .01$, $\beta = .17$, whereas avoidance temperament was unrelated to these goals ($\beta = .04$, $p = .44$). Both avoidance temperament, $F(1, 314) = 8.93$, $p < .01$, $\beta = .17$, and approach temperament, $F(1, 314) = 5.67$, $p < .05$, $\beta = .13$, were a positive predictor of task-/self-avoidance goals combined. In the consequences analyses, only two results were different from the initial findings: Task-/self-approach goals combined were not a significant positive predictor of absorption in class ($\beta = .11$, $p = .24$), as task-approach (but not self-approach) goals were in the 3 × 2 analysis, and task-/self-approach goals were not a significant positive predictor of learning efficacy ($\beta = .09$, $p = .29$), as task-approach (but not self-approach) goals were in the 3 × 2 analysis.

In sum, the results of this study again provide clear support for the separation of task-based and self-based goals, and the 3 × 2 achievement goal model more generally. The antecedents and consequences data largely conformed to predictions, with the consequences data yielding evidence of differential predictive patterns for the task-based and self-based goals.

Multigroup comparison across the German and U.S. samples. To test the extent to which the factor structure of the 3 × 2 achievement goal items is invariant across the German (Study 1) and U.S. (Study 2) samples, a series of multigroup CFAs was conducted. Specifically, we examined the equivalence of the factor structure across samples by imposing equivalence constraints at each of several increasingly stringent levels (Steenkamp & Baumgartner, 1998; Vandenberg & Lance, 2000). Four models were compared: a configural invariance model, a metric invariance model, a (factor) variance/covariance invariance model, and an error variance invariance model. In the configural invariance model, the same hypothesized pattern of fixed (zero) and free factor loadings (i.e., the items for each goal load only on their respective latent factor) was specified across samples (Steenkamp & Baumgartner, 1998). In the metric invariance model, the matrix of factor pattern coefficients was constrained to be identical across samples. This implies that common factors have the same meaning in the different samples, as reflected in invariant factor loadings. In the variance/covariance invariance model, in addition to the equality constraints on the factor loadings, factor variances and covariances were set to be equal across samples. Support for this model would indicate that the factor correlations are the same in the different samples. In the error variance invariance model, additional between-group equality constraints were imposed on the error variance of the indicator variables. Support for this model would indicate that the items are equally reliable in the different samples and would document the strongest measurement equivalence across the two countries. Following convention, the mea-

Table 7
Study 2: Achievement Goals as Predictors of the Dependent Variables

Variable	Exam performance	Intrinsic motivation	Learning efficacy	Worry about exams	Absorption in class	Energy in class
1. Task-approach goals	.14/.11/.09/.14/—	.22**/.22**/.20*/.20*/.20*	.20*/.18*/.24**/.16*/.17*	−.03/−.02/−.01./04/.00	.22**/.21**/.20*/.17*/.21*	−.00/.00/−.04/−.04/−.01
2. Task-avoidance goals	.10/.12/.12/.10/—	−.07/−.06/−.07/−.06/−.07	−.01/.00/−.02/.00/−.01	−.01/−.02/−.01/−.06/.00	−.08/−.08/−.09/−.05/−.09	.09/.09/.10/.10/.09
3. Self-approach goals	−.06/.01/−.04/−.06/—	−.01/.01/.01/−.01/.00	−.04/.01/−.05/−.06/−.03	.16/.12/.14/.16/.14	−.07/−.04/−.04/−.07/−.05	.26**/.23*/.28**/.28**/.26**
4. Self-avoidance goals	−.17/−.18/−.21*/−.18/—	.03/.03/−.00/.04/.06	−.01/−.01/−.01/.00/.03	−.03/−.03/.01/−.06/−.11	.06/.06/.01/.08/.12	−.24*/−.24*/−.26*/−.26*/−.23*
5. Other-approach goals	.37**/.39**/.36**/.37**/—	.12/.13/.12/.12/.08	.25**/.27**/.24*/.24*/.19*	−.12/−.13/−.11/−.12/−.02	.11/.11/.10/.10/.04	.14/.13/.15/.15/.13
6. Other-avoidance goals	−.21*/−.21*/−.20*/−.21*/—	−.07/−.07/−.06/−.06/−.05	−.31**/−.31**/−.29**/−.29**/−.28**	.30**/.30**/.28**/.26**/.26**	−.14/−.14/−.12/−.11/−.12	−.12/−.12/−.12/−.12/−.11

Note. Tabled values are standardized coefficients from the regression equations. For each column and variable, the first value is from the initial analysis, the second value is from the analysis controlling for Scholastic Aptitude Test scores, the third value is from the analysis controlling for response bias, the fourth value is from the analysis controlling for approach and avoidance temperaments, and the fifth value is from the analysis controlling for exam performance. The em dash means the values cannot be computed.
* $p < .05$. ** $p < .01$.

surement invariance models were evaluated using absolute fit indexes (CFI, TFI, and RMSEA), change in CFI (ΔCFI), and change in TLI (ΔTLI). ΔCFI and ΔTLI are the decrease in CFI or TFI value in comparison to the previous, less stringent model (e.g., when testing the error variance invariance model, ΔCFI represents the decrease in CFI relative to the CFI for the variance/covariance invariance model). CFI and TFI ≥ .90, RMSEA ≤ .08, ΔCFI ≤ .01, and ΔTLI ≤ .02 are considered evidence in support of the more stringent model (Browne & Cudeck, 1993; Cheung & Rensvold, 2002; Little, 1997). The most stringent model that passes the above criteria is considered the final model, which represents the degree of factorial invariance across samples.

The results summarized in Table 8 provide clear support for invariance up to and even including the most stringent error variance invariance model. Indeed, the fit of the error variance invariance model was good, $\chi^2(87, N = 443) = 639.98$, $p < .01$, CFI = .94, TLI = .94, RMSEA = .052, ΔTLI = .01, with the only (minor) exception being ΔCFI = .02; the factor loadings of this model were all highly significant (ranging from .75 to .95). These results not only indicate that the 3 × 2 factor structure emerges across samples but also that the factor loadings, factor correlations, and error variances are equivalent in the different samples. In short, strong evidence for invariance across the two samples was observed.

General Discussion

The present research comprised two studies designed to put the 3 × 2 achievement goal model to empirical test, and the results from both studies provided strong support for the model. Studies 1 and 2 yielded data establishing the 3 × 2 structure of achievement goals, both within and across samples from Germany and the United States. Study 2 documented the antecedents and consequences of each of the goals in the 3 × 2 model. In the following, we overview the specific findings from the two studies, then proceed to address the broader implications of our research for the achievement goal literature.

The Present Results

In Studies 1 and 2, students' reported their achievement goals for their exams using a new 3 × 2 achievement goal measure. The data indicated that each of the hypothesized goals were assessed reliably, and the hypothesized 3 × 2 model provided a good fit to the data. Indeed, the 3 × 2 model was shown to fit the data better than the 2 × 2 model, the trichotomous model, the dichotomous model, and a variety of other alternative models. This same pattern of results was obtained with samples from Germany and the United States.

Approach and avoidance temperaments were linked to the 3 × 2 achievement goals in the predicted manner. Our results conceptually replicated prior work, in that we obtained evidence of both a valence match (approach-based goals emerging from approach temperament; avoidance-based goals emerging from avoidance temperament) and a valence override (other-approach goals emerging from avoidance temperament). The pattern that was unique to the 3 × 2 model was that observed for task-avoidance and self-avoidance goals, in that these avoidance-based goals were found to emerge from both approach and avoidance temperaments. Structurally, task-avoidance and self-avoidance goals each represent a combination of optimal (task-based and self-based standards) and nonoptimal (avoidance) goal components, and these hybrid forms of regulation appear to be the product of a deeper approach-avoidance ambivalence (Cacioppo et al., 1993; Thompson, Zanna, & Griffin, 1995) or conflict (Lewin et al., 1944; Smillie, Pickering, & Jackson, 2006). Task-based and self-based goals evidenced the same antecedent profiles in our data, and we suspect that these types of goals emerge from very similar dispositions in general. We think it is situational factors that are likely to produce the most divergence in task-based and self-based goal adoption. For example, task-based goal pursuit may be more prevalent in classrooms utilizing an absolute grade distribution based on percentage correct, whereas self-based goal pursuit may be more common in achievement settings where intrapersonal improvement is emphasized or even incorporated into the evaluation process. Subsequent work would do well to investigate such possibilities.

Although task-based and self-based goals emerged from the same antecedents, these goal types were linked to a different set of consequences. Most notably, task-approach goals were a positive predictor of intrinsic motivation, learning efficacy, and absorption in class, whereas self-approach goals were unrelated to each of these variables. We believe that this differential pattern reflects the more direct and immediate nature of competence evaluation in task-approach, relative to self-approach, goal pursuit that is optimal for phenomenological experience and the processing of competence-relevant information (Barrett & Morgan, 1995; Jennings, 1993). The one dependent variable that self-based, but not task-based, goals predicted was energy in class; self-approach goals were a positive predictor, whereas self-avoidance goals were a negative predictor. Recent empirical work on goal-based regulation indicates that mentally contrasting a future possibility with a present reality facilitates energization and invigoration (Oettin-

Table 8
Multigroup Confirmatory Factor Analyses

Model	$\chi^2(N = 443)$	*df*	CFI	TLI	RMSEA	ΔCFI	ΔTLI
Configural invariance model	423.03**	138	.97	.96	.042		
Metric invariance model	475.31**	126	.96	.95	.045	.01	.01
Variance/covariance invariance model	510.15**	105	.96	.95	.044	.00	.00
Error variance invariance model	639.98**	87	.94	.94	.052	.02	.01

Note. CFI = comparative fit index; TLI = Tucker–Lewis Index; RMSEA = root-mean-square error of approximation.
* $p < .05$. ** $p < .01$.

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gen et al., 2009), and our results suggest that focusing on an intrapersonal standard in this contrast process is particularly impactful. Additional research is needed to explore the generalizability of these self-based goal findings and to investigate the mechanism(s) responsible for the observed relations. Additional research is also needed to explore possible links between task-avoidance goals and achievement-relevant dependent variables, as this is the one goal construct that was not linked to any of the focal variables in our research. Finally, consistent with findings from prior research (Darnon, Butera, et al., 2009; Elliot & Moller, 2003; Sideridis, 2005; Van Yperen, 2006; Zusho et al., 2005), other-approach goals were shown to facilitate performance but were unrelated to phenomenologically based variables, whereas other-avoidance goals were shown to be problematic for both performance and phenomenological experience (albeit somewhat less strongly than anticipated in a few instances). The aforementioned findings for both antecedents and consequences were shown to be robust when controlling for SAT scores and response bias. In short, theory and empirical data alike indicate the need to expand the 2 × 2 achievement goal model to a 3 × 2 achievement goal model that separates task-based and self-based goals.

A noteworthy aspect of our research is that it documents the structural validity and predictive utility of the 3 × 2 model under the most stringent of measurement conditions. Specifically, in the 3 × 2 measure used herein, all items (a) focus exclusively on aims, (b) focus exclusively on competence/incompetence, (c) focus on the same task (i.e., taking an exam), and (d) are worded in a highly similar fashion, particularly with regard to the approach-avoidance distinction. Although this type of measure provided an unusually stringent test of our hypotheses, it also undoubtedly prompted response sets that inflated the intercorrelations among the goal variables (see Murayama, Elliot, & Yamagata, in press, for a discussion of this and related issues). For example, participants may have responded similarly to similarly worded items and/or they may have tended to agree with any and all competence-based goal commitments (across definition and valence). These response sets may be addressed empirically through the use of simultaneous multiple regression (as in the present work), but the fact remains that an important avenue for future research is to examine various instruction sets, response formats, and perhaps even item wordings that may afford a cleaner and more sensitive assessment of the 3 × 2 achievement goals. Future research is also needed to test the 3 × 2 model for the task of learning. In terms of both theory and item content, the 3 × 2 model is as applicable to learning exam-relevant material as it is to taking an exam, and it will be interesting to see whether the structural relations among the goals and the predictive patterns for each goal are the same or somewhat different across types of task.

Conceptual Coverage of the 3 × 2 Model

As noted in the introduction, competence has two fundamental components: definition and valence. All competence-based goals are clearly differentiated on the valence component, but not all are clearly differentiated on the definition component. That is, all competence-based goal representations explicitly indicate whether they are focused on the positive possibility of success or the negative possibility of failure, but some competence-based goal representations explicitly indicate how competence is defined, whereas others do not (e.g., "I am striving to do well in school"). These latter goals may implicitly carry information about how competence is defined, but such information is not overtly delineated. The 3 × 2 model offered herein explicitly differentiates goals on both the definition and valence components of competence.

Grounding the 3 × 2 model in definition and valence not only establishes clear parameters for theory development but also provides guidelines to help determine when model expansion is no longer needed. With regard to the definition component of competence, three basic ways to define competence may be identified—using task-, self-, and other-based standards of evaluation—and these three are posited to fully cover the conceptual space of competence definition. With regard to the valence component of competence, two basic ways to valence competence may be identified—positively (i.e., success) and negatively (i.e., failure)—and these two are posited to fully cover the conceptual space of competence valence. These two components are independent and may therefore be fully crossed to produce the six goals of the 3 × 2 model, and we think that these six goals comprehensively cover the content universe of goals differentiated by definition and valence. In addition, each of the six goals may be clearly and precisely conceptualized and operationalized, and each represents a simple combination of two basic, easy-to-understand, components. Accordingly, we think that the 3 × 2 model retains the straightforward appeal that has been a signal characteristic of achievement goal models since the inception of this research tradition.

Importantly, our claim of comprehensive coverage does not mean that we think that each and every goal within a given cell of the 3 × 2 model is identical. First, the goals that individuals pursue in daily life, including their competence-based goals, are uniquely crafted and personalized to meet the idiosyncratic challenges and threats that they face (Elliot & Sheldon, 1997). Second, goals vary on many dimensions that have little to do with competence per se, such as level of abstraction, time frame, and individual versus group focus (for reviews, see Austin & Vancouver, 1996; Ford, 1992; Locke & Latham, 1990). Third, some ways that goals vary are uniquely or particularly relevant to one or a subset of the 3 × 2 goals. For example, task-based goals may focus on a single event (e.g., getting an exam question correct or not) or a cumulative event (e.g., getting a certain percentage of exam questions correct or not; White, 1963). Self-based goals may focus on one's past performance or on one's future potential performance (Wilson & Ross, 2000), either within or across domains (Marsh, 1986). Other-based goals may focus on performance relative to a concrete visible other or on performance relative to an abstract normative distribution of others (Butler, 1998). Each of the aforementioned considerations might influence the way that a goal is represented and pursued, and each is worthy of empirical attention in achievement goal research. However, none of the aforementioned considerations identifies an additional component of competence or a way of defining or valencing competence that is not covered by the 3 × 2 model.

Terminological and Conceptual Considerations

In any developing, empirically based literature, terminological issues emerge that must be addressed for the field to continue to

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advance in a coherent manner (Hulleman et al., 2010; Murphy & Alexander, 2000; Pintrich, 2003). A milestone in this regard within the achievement goal literature is Ames and Archer's (1987) proffering of the mastery–performance goal distinction. As noted in the introduction section, the achievement goal construct had its genesis in late 1970s and early 1980s, as a number of different theorists proposed models that distinguished between two forms of achievement strivings thought to differentially influence achievement-relevant outcomes. Despite using different terminology (e.g., task-ego, learning-performance), these models attended to the same basic conceptual distinction (a "jangle fallacy," i.e., using different labels for the same construct; Kelly, 1927). Ames and Archer (1987) addressed this issue by arguing for terminological convergence in the form of a mastery–performance goal dichotomy. This integrative move brought cohesion to the nascent achievement goal literature and laid the conceptual foundation for an outpouring of empirical work that firmly established the importance of the achievement goal construct.

As the achievement goal literature has developed over the years, the mastery–performance goal distinction has taken on two distinct meanings. Early on, the mastery goal construct was conceptualized in terms of the development of competence, and the performance goal construct was conceptualized in terms of the demonstration of competence. Task mastery and normative ability were sometimes included in descriptions and/or operationalizations of mastery and performance goals, respectively, but often they were not, and several reviewers of the achievement goal literature have concluded that the development–demonstration distinction represents the conceptual core of the initially articulated mastery–performance distinction (Elliot, 2005; Kaplan & Maeher, 2007; Urdan, 2004). Several years later, a second way of conceptualizing the mastery–performance goal distinction was introduced into the literature. This approach viewed the standard used to define competence as the core of the mastery–performance distinction and conceptualized the mastery goal construct in terms of an objective/intrapersonal standard and the performance goal construct in terms of an interpersonal standard (Elliot, 1999; Elliot & Thrash, 2001). At present, both of these conceptualizations are active in the literature, with the result being that the same terms, mastery and performance, are used to mean two different things (a "jingle fallacy," i.e., using the same label for different constructs; Thorndike, 1904). Thus, the mastery–performance goal distinction that was initially introduced to address a jangle fallacy has, ironically, spawned a jingle fallacy that is producing a considerable amount of confusion and, likely, impeding progress in the achievement goal literature.

The most direct way to address this problem is to assign different labels to the different conceptual approaches used in the literature. Specifically, we propose that the initially articulated approach grounded in the development–demonstration distinction be referred to as the development–demonstration model, and the more recently introduced approach grounded in standards of competence evaluation be referred to as the standards model. Valence is clearly relevant to each (see Ryan & Shim, 2006, 2008), thus the most advanced manifestations of these models would be the 2 × 2 development–demonstration model and the 3 × 2 standards model. As for the mastery–performance labels, we think it best, at present, for researchers using the development–demonstration and 3 × 2 standards labels to also explicitly link them to the mastery–performance labels in order to facilitate continuity with prior work. Over time, the mastery–performance labels may be retained as helpful, omnibus designations or they may eventually outlive their utility and be omitted. Working toward terminological precision is difficult, particularly in a well-established field, but we think it holds great promise not only in yielding conceptual, operational, and interpretational clarity but also in providing a common currency across disciplines that, at present, use diverse labels for achievement goal constructs (e.g., mastery–performance in educational and social-personality psychology, learning-performance in I/O psychology, and task-ego in sport and exercise psychology).

We refer to the constructs in the 2 × 2 development–demonstration model as goals, because they are described as such in the development–demonstration approach. It is important to reiterate, however, that from the development–demonstration standpoint, a goal is an underlying reason for behavior or a "superordinate" or "higher level" purpose behind the outcome that an individual strives for in his or her behavior (Dweck, 1992, p. 165). In the standards approach, goal is construed as the concrete aim used to guide behavior, as opposed to the underlying reason for behavior. Thus, although the two approaches diverge in their conceptual definition of goal, they appear to coverage in distinguishing between high-level reasons and low-level aims. In future research, it would be interesting to move beyond the conceptual to an empirical examination of the factorial separability and differential predictive utility of these two approaches. We think it best if such research refrains from pitting one model against the other (e.g., in terms of which accounts for more variance in outcomes) and, instead, focuses on how the two models can be integrated.

Indeed, as important as it is to separate reasons and aims, we think it is equally important to recognize that the two are commonly intertwined in the process of regulation (see Lewin, 1935). A reason is usually accompanied by an aim (or aims, albeit often not explicitly specified), and an aim is usually undergirded by a reason (or reasons, albeit often not explicitly specified). We refer to these reason–aim combinations as goal-complexes (Elliot & Thrash, 2001; Thrash & Elliot, 2001; see also Allport, 1937; Murray, 1938).[3] A good starting place for thinking about goal complexes is at the intersection of the development–demonstration and standards approaches. For example, one type of goal complex is "trying to do well relative to others IN ORDER TO demonstrate that I have ability"; as noted earlier, this is how some researchers have conceptualized and/or operationalized performance-approach goals in prior work. Another type of goal complex is "trying to do well relative to others IN ORDER TO develop my ability"; this plausible (and likely prevalent) goal complex cannot be considered without separating reason and aim. Indeed, separating reason and aim allows for a host of idiographic achievement goal complexes to be identified, such as "trying to do a task correctly IN ORDER

[3] The term goal orientation is sometimes used in the achievement goal literature to refer to reason–aim combinations, and in this sense, there is some overlap between the goal orientation and goal complex constructs. However, the term *goal orientation* is also used to mean other things, most notably, dispositional goal propensities (as distinct from situational goal states; see Finney, Pieper, & Barron, 2004; Hulleman et al., 2010). As such, we prefer to use the term *goal complex* when referring to reason–aim combinations.

TO make points with my attractive lab partner," "trying to perform better than before IN ORDER TO avoid feeling guilty," and "trying to avoid doing poorly relative to others IN ORDER TO avoid being shamed by my parents." In short, this separation of reasons and aims is beneficial, because it brings definitional precision and clarity, while at the same time affording tremendous range and flexibility in accounting for real world achievement behavior. We think that empirical work on goal complexes holds great promise in the achievement goal literature and that the conceptual separation of reasons and aims, coupled with the establishment of a 3 × 2 model focused on aims per se, paves the way for such research to proceed in earnest.

Implications and Limitations

There is considerable consensus in the achievement goal literature that administrators and teachers would do well to facilitate the pursuit of development-approach and task-/self-approach goals and to discourage the pursuit of demonstration-avoidance and other-avoidance goals in the classroom (Ames, 1992; Anderman & Midgley, 1997; Darnon, Dompnier, Delmas, Pulfrey, & Butera, 2009; Dweck, 1999; Harackiewicz, Barron, Tauer, & Elliot, 2002; Kaplan & Midgley, 1997; Karabenick, 1994; Meece, Anderman, & Anderman, 2006; Murayama & Elliot, 2009; Patrick & Ryan, 2008; Ryan, Pintrich, & Midgley, 2001; Turner & Patrick, 2004; Urdan, 1997; Wolters, 2004). The results of the present research support these recommendations but also suggest an important refinement. More specifically, the present findings highlight the need to discourage the pursuit of other-avoidance goals and intriguingly point to the benefits of promoting task-approach over self-approach goals. Clearly more research is needed before a definitive statement can be made on the merits of facilitating task-approach relative to self-approach goals in the classroom. For example, one important question in need of research is whether task-approach goals are beneficial for highly complex tasks in which successful completion is difficult to discern and somewhat subjective. Nevertheless, the present findings make salient the applied utility of the 3 × 2 model. Indeed, the concrete focus on standards of competence evaluation in this model maps nicely onto the concrete types of competence assessment available to educators in real-world achievement settings. As such, the 3 × 2 model seems particularly likely to generate empirical knowledge that has immediate and direct implications for actual classroom practice.

Importantly, in conducting empirical research with the 3 × 2 model, we do not think it is necessary to use the full roster of goals in each and every study. As the literature advances and research questions become more refined, it is logical for investigations to focus on a subset of goals from the full model. Thus, researchers may focus specifically on the three approach goals or the three avoidance goals when interested in studying the definition aspect of goals, others may focus specifically on task-based goals or self-based goals or other-based goals when interested in studying the valence aspect of goals, and still others may focus specifically on other combinations altogether (e.g., task-approach and self-approach goals when interested in further examining their differential predictive utility). Establishment of the 3 × 2 model provides conceptual, operational, and interpretational guidance, it does not dictate how empirical work on the goals within the model should be conducted.

A limitation of the present research is our exclusive focus on university undergraduates in a normative evaluative context; future research would do well to examine the 3 × 2 model with younger students, with students of a broader range of academic interest and level of accomplishment, and with individuals in a non-normative evaluative environment. In addition, future research would do well to explicitly compare and contrast the 3 × 2 measure herein with existing 2 × 2, trichotomous, and dichotomous achievement goal measures. Furthermore, although our research was conducted in two different countries (Germany and the United States), prior to making claims about cross-cultural generalizability, it would be helpful to extend the focus beyond Western countries to places such as Japan, China, and South Korea that are presumed to foster somewhat different motivational tendencies (Elliot, Chirkov, Sheldon, & Kim, 2001; Maehr & Nicholls, 1980; Urdan, 2004; Zusho & Njoku, 2007; cf. Murayama, Zhou, & Nesbit, 2009). Future research is also needed to examine antecedents and consequences of the 3 × 2 achievement goals with a focus on other tasks besides classroom examinations. The items in the 3 × 2 AGQ are easily adapted to others types of achievement tasks, and we encourage researchers to conduct additional empirical work accordingly. Finally, although Study 2 used a rigorous prospective methodology and ruled out plausible alternative predictor variables, the data remain correlational in nature. As such, the terms antecedents and consequences are used to communicate the proposed nature of the focal relations and are not meant to imply causality. Longitudinal research with repeated assessments and experimental work is needed before more definitive conclusions regarding causation may be drawn.

Concluding Comments

In the present research, we documented the need to bifurcate task-based and self-based forms of achievement goals and, in so doing, validated the 3 × 2 achievement goal model. We view this model as a logical derivation of the 2 × 2 achievement goal model but also as its own distinct framework that is applicable to any and all achievement settings, traditional (e.g., the classroom) and nontraditional (e.g., avocational activities) alike. As achievement goal research enters its fourth decade, it is our hope that the 3 × 2 model produces conceptual, empirical, and applied advances that keep the study of achievement goals at the forefront of the achievement motivation literature.

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(*Appendix follows*)

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Appendix A

Items for the 3 × 2 Achievement Goal Questionnaire

Instructions: The following statements represent types of goals that you may or may not have for this class. Circle a number to indicate how true each statement is of you. All of your responses will be kept anonymous and confidential. There are no right or wrong responses, so please be open and honest.

1	2	3	4	5	6	7
not true of me		slightly true of me	moderately true of me		very true of me	extremely true of me

Task-approach goal items

To get a lot of questions right on the exams in this class.
To know the right answers to the questions on the exams in this class.
To answer a lot of questions correctly on the exams in this class.

Task-avoidance goal items

To avoid incorrect answers on the exams in this class.
To avoid getting a lot of questions wrong on the exams in this class.
To avoid missing a lot of questions on the exams in this class.

Self-approach goal items

To perform better on the exams in this class than I have done in the past on these types of exams.
To do well on the exams in this class relative to how well I have done in the past on such exams.
To do better on the exams in this class than I typically do in this type of situation.

Self-avoidance goal items

To avoid doing worse on the exams in this class than I normally do on these types of exams.
To avoid performing poorly on the exams in this class compared to my typical level of performance.
To avoid doing worse on the exams in this class than I have done on prior exams of this type.

Other-approach goal items

To outperform other students on the exams in this class.
To do well compared to others in the class on the exams.
To do better than my classmates on the exams in this class.

Other-avoidance goal items

To avoid doing worse than other students on the exams in this class.
To avoid doing poorly in comparison to others on the exams in this class.
To avoid performing poorly relative to my fellow students on the exams in this class.

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