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Back to the roots: The 2 × 2 standpoints and standards achievement goal model

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ABSTRACT

In the original dichotomous conceptualization of achievement goals, mastery and performance goals contained two competence foci: standpoints on competence and standards of competence evaluation. Conceptually and operationally, this feature of the original model has been overlooked. The present research integrates this original conceptualization with the approach-avoidance distinction, resulting in the 2 × 2 standpoints and standards (SaS) model. In Study 1, we develop and test the psychometric properties of a questionnaire designed to assess these goals. In Study 2, we examine the predictive utility of these goals in the classroom context, investigating exam performance, intrinsic motivation, test anxiety, absorption, energy, and affect using a sample of 324 university students. Results from the studies support the utility of the 2 × 2 SaS model and questionnaire. We discuss our findings with regard to implications for teachers and parents, links to the emerging goal complex literature, and future research possibilities afforded by this new (grounded in old) approach.

1. Introduction

In competence-relevant situations, individuals commonly pursue achievement goals. In order to study these achievement goals, clear and systematic conceptual models are needed, with equally clear and systematic measures that map directly onto these models. Several different models of achievement goals have been articulated over the past four decades, and much has been learned about the structure and predictive utility of achievement goals, accordingly (for a review, see Elliot & Hulleman, 2017).

In the present research, we return to the roots of the achievement goal approach, specifically to the original dichotomous model proffered in the 1980s. In doing so, we highlight an often overlooked and clearly understudied feature of this model—that achievement goals originally contained both standpoints and standards—and integrate this feature with the more recently embraced approach-avoidance distinction. Furthermore, we develop and test a new achievement goal measure designed to assess the resulting constructs, and use this measure in a university classroom context to predict processes and outcomes of central interest to achievement goal theorists. Finally, we highlight implications of our findings for teachers and parents, integrate our research with research on achievement goal complexes, and point to avenues for future empirical work.

We want to be explicit from the start about our intentions herein. We are *not* advocating that achievement goal researchers return to the original conceptualization at the expense of attending to more recent conceptual and empirical advances. Rather, we aim to fill in a surprisingly missing piece of the achievement goal puzzle—measuring and conducting empirical work on the originally articulated goal constructs—which we believe will yield a broader and deeper understanding of the nature of achievement goals, and provide an additional option for researchers interested in conducting research in this rich and generative area.

1.1. The original conceptual work

Although several theorists were involved in establishing the original conceptualization of achievement goals, work by Carol Dweck and John Nicholls was particularly influential. Both Dweck and Nicholls identified two primary types of achievement goals. Dweck (1984); Dweck and Elliott (1983); Dweck and Leggett (1988) distinguished between *learning goals* focused on increasing, improving, or developing one's competence through the use of personal standards emphasizing progress, understanding, and mastery; and *performance goals* focused on

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validating, proving, or demonstrating one's competence through the use of normative or competitive standards. Nicholls (1984a, 1984b, 1986); Nicholls, Patashnick, Cheung, Thorkildsen, and Lauer (1989) distinguished between *task involvement goals* focused on developing or increasing one's self-referential competence and understanding, and *ego involvement goals* focused on demonstrating or showing one's competence relative to others. Noting the conceptual convergence in the work of Dweck, Nicholls, and others, Ames (1992) offered an integrative model using the labels mastery and performance goals. She highlighted multiple ways that the two goals differ, including the central, convergent ideas in Dweck's and Nicholls' work that *mastery goals* focus on the development of competence and the use of self-referenced (and, less explicitly, task-referenced) standards, whereas *performance goals* focus on the demonstration of competence and the use of other-referenced standards.

Over the years, a number of theorists have recognized that there are two distinct competence-based foci in this original dichotomous mastery-performance goal model (Chung & Bong, 2017; Elliot, 1999; Hulleman, Schrager, Bodmann, & Harackiewicz, 2010; Senko & Tropiano, 2016; Urdan & Mestas, 2006). Korn and Elliot (2016) used the terms standpoints and standards to describe these two foci. A standpoint on competence is a perspective that one takes with regard to competence; one may view competence from the standpoint of developing it (mastery goal) or demonstrating it (performance goal). A standard of competence is a criterion that one uses to evaluate competence; one may evaluate competence with a self-based (and/or task-based) standard (mastery goal) or an other-based standard (performance goal). Dweck and Nicholls (as well as Ames) differed somewhat in the degree to which they emphasized the separate versus integrated nature of these standpoints and standards, and the degree to which they emphasized one over the other. Dweck emphasized the separateness of standpoints and standards, and the relative importance of standpoints (see, e.g., Dweck & Elliott, 1983, p. 655), whereas Nicholls (see, e.g., Nicholls, 1984a, p. 329), as well as Ames (see, e.g., Ames, 1992, p. 262), emphasized the integrated nature of standpoints and standards, and placed approximately equal importance on each (although even within these theorists, their emphases varied somewhat across writings). Regardless, it seems clear that both standpoints and standards were given a prominent place in the original dichotomous model, with each of the goals representing a combination of these two competence-based foci. Mastery goals combined a development standpoint with a self-referential (and/or task-referential) standard, and performance goals combined a demonstration standpoint with an other-referential standard.

1.2. Subsequent developments

Historically, the distinction between approaching success and avoiding failure has been integral to conceptual accounts of achievement motivation (Atkinson, 1964; Lewin, Dembo, Festinger, & Sears, 1944). However, in the original dichotomous conceptualization of achievement goals, this was either given minor attention or overlooked altogether. That is, both Dweck and Nicholls either considered appetitive and aversive strivings to be part of a unitary construct or simply ignored this distinction completely (Dweck, 1984; Dweck & Leggett, 1988; Nicholls, 1984a, 1984b). For example, in some writings Nicholls et al. (1989) explicitly characterized the goals as “two forms of approach motivation” (p. 188), and Ames (1992) followed Nicholls in describing the two goals as approach tendencies. Subsequent theorizing, however, has fully incorporated the approach-avoidance distinction, acknowledging that any competence-based goal can be defined in terms of the valence of competence (approaching success or avoiding failure), as well as the focus of competence (Elliot, 1999).

Subsequent theorizing also generated achievement goal models that explicitly focused on standpoints alone or standards alone. First, in the 2 × 2 (standards) model of achievement goals (Elliot, 1999; Pintrich, 2000), goals were conceptualized in terms of the standards of competence evaluation alone—self-referential (and/or task-referential) versus other-referential—crossed by the valence of competence. This yielded mastery-approach (striving to attain self-based, and/or task-based, competence), mastery-avoidance (striving to avoid self-based, and/or task-based, incompetence), performance-approach (striving to attain other-based competence), and performance-avoidance (striving to avoid other-based incompetence) goal constructs. Second, in a more recent development, the 2 × 2 standpoints model of achievement goals (Korn & Elliot, 2016), goals were conceptualized in terms of the standpoints of competence alone—development versus demonstration—crossed by the valence of competence. This yielded development-approach (striving to increase competence), development-avoidance (striving to avoid a decrease in competence), demonstration-approach (striving to demonstrate competence), and demonstration-avoidance (striving to avoid demonstrating incompetence) goal constructs.

1.3. A 2 × 2 standpoints and standards model

Surprisingly, what has yet to be considered in the literature is an achievement goal model comprised of the originally articulated dichotomous goals crossed by the approach-avoidance distinction. We focus on this model in the present research, referring to it as *the 2 × 2 standpoints and standards* (*SaS*) model. In this model, the first component is the focus of competence which includes both a standpoint and a standard equally weighted (i.e., of equal importance) and fully integrated together. This first component distinguishes between a combined focus on competence development and self-referential (and/or task-referential) competence evaluation on the one hand, and a combined focus on competence demonstration and other-referential competence evaluation on the other hand. The second component is the valence of competence which represents the distinction between approaching success and avoiding failure. Crossing the focus and valence components of competence produces the following four achievement goals: *original mastery approach* (striving to increase self-referential, and/or task-referential, competence), *original mastery avoidance* (striving to avoid a decrease in self-referential, and/or task-referential, competence), *original performance approach* (striving to demonstrate other-referential competence), and *original performance avoidance* (striving to avoid demonstrating other-referential incompetence). We use the “original” label for these goals to highlight their grounding in the initial conceptualization of the dichotomous achievement goal model, the “mastery” and “performance” labels to reinforce the connection to this initial conceptualization, and the “approach” and “avoidance” labels because they are the modal terms used to represent the valence component in the literature.

Research has yet to be conducted that maps directly onto this 2 × 2 SaS framework (see Hodis, Tait, Hodis, Hodis, & Scornavacca, 2016, for the closest analog[1]). In fact, a careful examination of extant measures of achievement goals indicates that even the originally articulated mastery (approach)/performance(approach) dichotomous goal model containing standpoints and standards has yet to be operationalized in systematic fashion. Existing measures of achievement goals were not designed to equally represent standpoints and standards, so these two foci are unequally weighted in available assessments. This is manifested in two interrelated ways. First, *within goal variables*, some items contain standpoints only, some contain standards only, and some contain both. Second, *within goal measures*, different goal variables have a differential proportion of items containing standpoints only, standards only, or

[1] Hodis et al. (2016) used single items to assess 24 different standpoint × standard × valence combinations; the four goals of the 2 × 2 SaS model were among the combinations covered, but the researchers did not focus specifically on the SaS model. Hodis et al. (2016) provided information on the structural relations among the twenty-four items and descriptive statistics for these items.

both. This lack of systematic representation of standpoints and standards is not just of conceptual importance, it is of empirical importance. Recent research has shown that achievement goal measures emphasizing standpoints and those emphasizing standards can have different relations with achievement-relevant processes and outcomes (Hulleman et al., 2010; Senko & Dawson, 2017), and we know nothing at present about their joint, integrated influence.

1.4. The present research

What is needed in the achievement goal literature is a systematically constructed measure of the 2 × 2 SaS model in which each item that is used to assess each of the four goals contains both standpoint and standard content. This would allow the initially articulated mastery (approach)/performance(approach) dichotomy to be tested, along with the extended part of this model that includes the two avoidance goals (mastery avoidance and performance avoidance). Accordingly, the primary empirical aims of the present research were to create and test the psychometric properties of this type of achievement goal measure (Study 1), and to test the predictive utility of the goals in the 2 × 2 SaS model in a classroom context (Study 2).

We were interested in the 2 × 2 SaS model alone in this research, not with comparing and contrasting this model to other established models in the literature. Such model comparisons can be helpful, but they require the necessary first step of documenting the validity and utility of a model in the first place; this is the aim of the present empirical work. Furthermore, we paired the development standpoint with a self-referential standard in this research rather than a task-referential standard. Self-referential standards garnered the most explicit attention in the original theorizing, and including both types of standards in the measure would be unnecessarily complicated at this stage of the research.

In both studies of this research, no manipulations and no data exclusions were used. All variables that were analyzed are reported, and all data were collected before analyses were conducted.[2]

2. Study 1

The purpose of Study 1 was to create a measure of the 2 × 2 SaS achievement goals that carefully and systematically maps onto the way that the goals of this model are conceptualized. This conceptualization-operationalization correspondence has been overlooked for decades, and we viewed it as a critical aim of the present research. We tested the psychometric properties of the measure, including the hypothesized structure, the hypothesized structure relative to alternative structures, and measurement invariance.

2.1. Method

2.1.1. Procedure and sample

The sample size for the study was set a priori at a minimum of 200 participants, which is consistent with recommendations for confirmatory factor analysis (MacCallum, Widaman, Zhang, & Hong, 1999). We were able to exceed this sample size target, as a total of 342 students (259 females, 83 males) at a U.S. university were recruited through the psychology department participant pool. Students received extra credit for their participation. The mean age of participants was 19.72 (*SD* = 1.19), with a range of 18–24. Participant ethnicity was as follows: 7 African, 109 Asian, 188 Caucasian, 17 Hispanic, and 21 "other". The study was approved by the university's institutional review board and was carried out in accord with their guidelines and principles.

Participants followed a web link to access the study. A welcome screen informed them that the study concerned individuals' goals. Participants selected one domain to focus on (school, job, hobbies, or other) and were asked to think about the goals that they have in that achievement setting. After completing the questionnaire, participants were asked to indicate their sex, age, and ethnicity.

2.1.2. Measures

In order to create the achievement goal questionnaire, a pool of candidate items for each of the goal variables was created. Several pilot studies were conducted to test different ways of measuring the goals, and twelve items were eventually selected on the basis of ease of understanding, conceptual coverage, and preliminary analysis. Each item started with a stem: "My goal is…", "My aim is…", or "I am striving…" and then contained a standpoint (develop or demonstrate) followed by a standard (self or other). The goals also varied by approach (success) or avoidance (failure).

The twelve items comprised three items for each focal goal: original mastery approach (e.g., "My aim is to increase my own competence over time"), original mastery avoidance (e.g., "My goal is to avoid a decrease in my individual ability over time"), original performance approach (e.g., "I am striving to demonstrate my knowledge compared to others"), and original performance avoidance (e.g., "My goal is to avoid demonstrating that I lack competence compared to others"). Participants rated the items with regard to their selected domain (school, job, hobbies, other) on a 1 (*not at all true of me*) to 5 (*extremely true of me*) scale. The complete list of items is provided in Appendix 1.

2.1.3. Analyses

In order to test the structure of the achievement goal items, we conducted Confirmatory Factor Analyses (CFAs) with Mplus (Muthén & Muthén, 2014) using the MLR estimator. For all of the structural equation models (SEM), we used χ^2 and SRMR as absolute fit indices, TLI as a relative fit index that also adjusts for parsimony, and RMSEA and CFI as noncentrality-based indices. Latent variables were standardized by setting their means to 0 and variances to 1.

To test for measurement invariance, we conducted multigroup confirmatory factor analyses (MGCFAs). In this type of analysis, the theoretical model is compared to the observed structure in multiple samples. We estimated multiple models for sex (male or female), ethnicity (Caucasian or Asian), and achievement domain (school or any other). A step-up approach was used to estimate a series of hierarchical models that imposed restrictions between the measurement models for the two groups. Specifically, the following models were compared: (a) a model in which the item/factor clusters were restricted between the two groups (*configural invariance*), (b) a model in which the factor loadings were also restricted (*metric invariance*), (c) a model in which the item intercepts were also restricted (*scalar invariance*), (d) a model in which the residual variances were also restricted (*strict invariance*), and (e) a model in which the correlations between the latent variables were also restricted (*complete invariance*).

2.2. Results

To test the structure of the goal items, we estimated hypothesized and alternative models (see Table 1). First, we estimated an undifferentiated model in which all items loaded onto one latent factor; this model did not fit the data adequately. Next, we estimated two-factor models in which all similarly valenced items (all approach or all avoidance) loaded together onto joint latent factors, or all original

[2] This research was conducted by Rachel Korn in partial fulfillment of the requirements for the degree of doctor of philosophy at University of Rochester. The dissertation included an additional laboratory study (with a much smaller sample than the research reported herein) and the following measures: achievement goals, general perceived competence, intrinsic motivation, competence expectancy, Raven's Progressive Matrices, and demographics. Readers interested in this preliminary study may contact Dr. Korn at rkorn88@gmail.com.

Table 1
Study 1: comparison of hypothesized and alternative models.

Model	*df*	χ^2	CFI	TLI	RMSEA	SRMR	Factor correlations	Factor loadings
1-factor model	54	714.38	0.50	0.39	0.20	0.19		0.10–0.86
2-factor valence model (approach/avoidance)	53	610.90	0.58	0.47	0.18	0.18	0.70	0.01–0.88
2-factor definition model (original mastery/performance)	53	297.86	0.81	0.77	0.12	0.10	0.01	0.47–0.87
3-factor model (original mastery collapsed)	51	215.53	0.88	0.84	0.10	0.09	−0.03–0.72	0.48–0.88
3-factor model (original performance collapsed)	51	201.98	0.89	0.85	0.09	0.07	−0.08–0.60	0.54–0.87
4-factor model (hypothesized 2 × 2 SaS)	48	100.46	0.96	0.95	0.05	0.04	−0.09–0.72	0.64–0.88

Note. $N = 342$.

mastery goal items loaded together onto a joint latent factor and all original performance goal items loaded together onto a joint latent factor. These models fit the data better than the 1-factor model (evaluated using –2ΔLL rescaled difference in the model log-likelihood values: $-2\Delta LL(1) > 67.72$, $p < .001$), but still did not fit the data adequately. Next, we estimated three-factor models in which approach and avoidance items were collapsed for original mastery or original performance goals (i.e., original mastery collapsed, original performance approach, original performance avoidance; original mastery approach, original mastery avoidance, original performance collapsed). These models showed a better fit to the data ($-2\Delta LL(2) > 55.92, p < .001$), but again did fit the data adequately. Finally, we estimated the hypothesized 4-factor model. This model had a good fit to the data, and a better fit than all previous models ($-2\Delta LL(3) > 78.69, p < .001$). All factor loadings were in the acceptable range (0.64–0.88).

Analyses of measurement invariance for sex, ethnicity, and achievement domain showed that the more restricted models did not fit the data worse than the less restricted models (see Table 2). The –2ΔLL difference tests were not significant and ΔCFI and ΔRMSEA were under the commonly suggested cut-off values of ΔCFI = 0.01 and ΔRMSEA = 0.015 (Chen, 2007). This indicates complete measurement invariance for sex, ethnicity, and achievement domain.

The internal consistency for each achievement goal was acceptable: original mastery approach (α = 0.82), original mastery avoidance (α = 0.73), original performance approach (α = 0.88), and original performance avoidance (α = 0.79). Means and standard deviations of all four goals (see Table 3) showed adequate variation, and the full possible range was mostly observed. Original mastery approach and avoidance goals ($r = 0.60$), as well as original performance approach and avoidance goals ($r = 0.69$), were moderately to strongly correlated, and relatively modest or no correlations were observed for the other goal pairs ($rs = -0.03$–0.12; see Table 3).

In sum, Study 1 provided clear support for the 2 × 2 SaS achievement goal model. The data fit the hypothesized model well, each of the goal constructs displayed good internal consistency, and the correlations between the goals suggested construct separation (Barron, Brown, Egan, Gesualdi, & Marchuk, 2008). Measurement invariance analyses indicated that this measure can be used to assess the same constructs with different groups of people and in various domains.

3. Study 2

The purpose of Study 2 was to test the goals of the 2 × 2 SaS model as predictors of achievement-relevant variables in a classroom setting. The dependent variables that we focused on were academic performance and intrinsic motivation, arguably the two most central and frequently researched variables in the achievement goal literature (Korn & Elliot, 2016), as well as other variables relevant to academic self-regulation and experience that are examined in prior achievement goal research—test anxiety; (Bandalos, Finney, & Geske, 2003), absorption (Barron & Harackiewicz, 2001), energy (Elliot, Murayama, & Pekrun, 2011), and positive and negative affect (Linnenbrink & Pintrich, 2002). In selecting the dependent variables, we sought to cover affective, cognitive, and behavioral outcomes, as well as both positive and negative outcomes. We assessed the links between the four achievement goals and the focal dependent variables, both alone and while controlling for relevant, a priori selected demographic variables (sex, year at school, GPA), as well as response bias (self-deceptive enhancement).

A number of considerations went into generating predictions for the examined relations: original theorizing regarding the dichotomous model, subsequent theorizing regarding standpoints alone and

Table 2
Study 1: results of measurement invariance testing.

Model	χ^2	df	χ^2/df	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔRMSEA	*TRd*	Δdf	*p*
Sex (male or female)												
Configural invariance	170.64	96	1.78	0.962	0.942	0.052	0.040					
Metric invariance	182.17	104	1.75	0.960	0.945	0.051	0.052	0.002	0.001	11.58	8	0.17
Scalar invariance	188.73	116	1.63	0.964	0.956	0.046	0.055	0.004	0.005	5.30	12	0.95
Strict invariance	200.08	128	1.56	0.964	0.962	0.042	0.070	0.000	0.004	13.78	12	0.31
Complete invariance	205.11	134	1.53	0.965	0.965	0.041	0.080	0.001	0.001	4.61	6	0.59
Ethnicity (Caucasian or Asian)												
Configural invariance	172.51	96	1.80	0.952	0.929	0.058	0.048					
Metric invariance	183.71	104	1.77	0.950	0.932	0.057	0.054	0.002	0.001	11.63	8	0.17
Scalar invariance	217.33	116	1.87	0.942	0.931	0.062	0.059	0.008	0.005	19.65	12	0.07
Strict invariance	242.23	128	1.89	0.936	0.929	0.063	0.064	0.006	0.001	17.39	12	0.14
Complete invariance	248.42	134	1.85	0.935	0.933	0.061	0.071	0.001	0.002	6.58	6	0.36
Domain (academic or other)												
Configural invariance	192.68	96	2.01	0.947	0.922	0.062	0.042					
Metric invariance	197.20	104	1.90	0.950	0.932	0.057	0.043	0.003	0.005	4.22	8	0.84
Scalar invariance	223.10	116	1.92	0.945	0.930	0.058	0.054	0.005	0.001	20.17	12	0.06
Strict invariance	233.02	128	1.82	0.942	0.939	0.054	0.061	0.003	0.004	13.50	12	0.33
Complete invariance	236.62	134	1.77	0.943	0.944	0.052	0.070	0.001	0.002	3.07	6	0.80

Note. *n*(male) = 259, *n*(female) = 83; *n*(Caucasian) = 188, *n*(Asian) = 109; *n*(academic) = 267, *n*(other) = 75.

Table 3
Study 1: descriptive statistics and latent correlations between goals.

	M	*SD*	Min	Max	Skew	[OMAP]	[OMAV]	[OPAP]	[OPAV]
Original mastery approach	4.23	0.69	1.30	5.00	−0.95		0.46***	−0.05	−0.02
Original mastery avoidance	3.50	0.83	1.00	5.00	−0.42	0.60***		0.10	0.27***
Original performance approach	3.23	1.02	1.00	5.00	−0.27	−0.09	0.12		0.59***
Original performance avoidance	3.33	0.95	1.00	5.00	−0.45	−0.03	0.34***	0.69***	

Note. $N = 342$. Possible range: 1–5. OMAP = original mastery approach; OMAV = original mastery avoidance; OPAP = original performance approach; OPAV = original performance avoidance. Latent correlations are provided in the lower diagonal matrix, manifest correlations in the upper diagonal matrix.
*** $p < .001$.

standards alone, subsequent theorizing regarding approach and avoidance motivation, and empirical work utilizing various types of relevant goal measures (standpoints alone, standards alone, and myriad combinations of standpoints and standards). We restricted our specific predictions to original mastery approach and original performance avoidance goals. Conceptually and empirically, these goals are the most straightforward in that the various components of these goals all align and the relevant empirical patterns are usually quite clear. The other two goals, original performance approach and original mastery avoidance, are more complex in that the various components of these goals suggest different possibilities and the relevant empirical patterns are often mixed (especially for original mastery avoidance goals; Elliot & Hulleman, 2017). As such, for this first empirical test we remained largely agnostic for these two hybrid goals, albeit anticipating that they would yield empirical patterns in between those of the other two goals (i.e., less positive than original mastery approach goals but less negative than original performance avoidance goals).

Conceptually, the most positive and favorable achievement goal is the original mastery approach goal. The development focus, the self-based standard, and the approach framing of this goal are all expected to promote full and sustained commitment, cognitive engagement, and positive immersion in the learning process (Dweck & Leggett, 1988; Elliot & Covington, 2001; Kaplan & Maehr, 2007; Nicholls, 1989). Empirically, goals containing these types of components have tended to predict a host of positive processes and outcomes; however, only weak positive or null relations are observed with academic performance because these goal components do not necessarily facilitate performance in the short-run on rote-based tasks (Baranik, Stanley, Bynum, & Lance, 2010; Elliot et al., 2011; Hulleman et al., 2010; Midgley, Kaplan, & Middleton, 2001). As such, we predicted that original mastery approach goals would be a null or weak positive predictor of academic performance and a positive predictor of intrinsic motivation; we also anticipated that these goals would yield a generally favorable pattern with the other focal cognitive and affective variables.

Conceptually, the most negative and unfavorable achievement goal is the original performance avoidance goal. The demonstration focus, the other-based standard, and the avoidance framing of this goal are all expected to prompt self-protection, interfere with cognitive engagement, and undermine affective experience during the learning process (Dweck & Leggett, 1988; Elliot & Covington, 2001; Kaplan & Maehr, 2007; Nicholls, 1989). Empirically, goals containing these types of components have tended to predict a diverse array of unfavorable processes and outcomes (Elliot et al., 2011; Grant & Dweck, 2003; Hulleman et al., 2010; Senko & Dawson, 2017). As such, we predicted that original performance avoidance goals would be a negative predictor of both academic performance and intrinsic motivation; we also anticipated that these goals would yield a generally unfavorable pattern with the other focal cognitive and affective variables.[3]

3.1. Method

3.1.1. Procedure and sample

The sample size for the study was set a priori as the maximum number of participants that could be recruited within the target course, knowing that the range would be between 300 and 400 participants.[4] A total of 324 students (203 females, 121 males) in an introductory level psychology course at a U.S. university participated for extra credit. The mean age of participants was 19.70 ($SD = 1.70$), with a range of 18–35. Participant ethnicity was as follows: 19 African, 106 Asian, 140 Caucasian, 33 Hispanic, and 26 "other". Participants' year at school was as follows: 109 freshmen, 101 sophomores, 64 juniors, 47 seniors, 2 "Take 5", and 1 "other". The study was approved by the university's institutional review board and was carried out in accord with their guidelines and principles.

Participants completed all self-report measures via an online web link. The demographics questions and response bias items were administered at the beginning of the semester. All other variables were assessed three times—once for each exam period in the class. Specifically, seven days before each exam, students completed the 2 × 2 SaS achievement goal questionnaire. Three days later and four days before the exam, participants completed the other self-report measures. The effects for each variable were investigated across the three assessment periods using hierarchical linear modeling (HLM; see details below), thereby affording a broader sampling of student self-regulation and experience than could be acquired from a single assessment period alone. Exam grades were obtained from the course professor after the course had been completed.

3.1.2. Measures

3.1.2.1. Achievement goals. The 2 × 2 SaS achievement goal questionnaire developed in Study 1 was used to assess participants' goals for each exam period of the class, although in this study the stems of some items were changed to make them uniform across standpoint and standard content. Specifically, in Study 1, three different stems were used ("My goal is", "My aim is", and "I am striving") prior to the standpoint and standard content; in this study, the stem "My goal is" was used for all items. Confirmatory factor analyses showed the same support for the items that was found in Study 1 (i.e., the hypothesized four factor solution fit the data best at all three measurement points, and very similar parameter estimates were obtained: $df = 48$, $\chi^2 = 66.2–122.8$, CFI = 0.96–0.99, TLI = 0.94–0.98, RMSEA = 0.03–0.07, SRMR = 0.01–0.05). Participants made their ratings on a 1 (*not at all true of me*) to 5 (*extremely true of me*) scale, and scores were averaged to create the four goal variables for each exam: original mastery approach ($\alpha(T1) = 0.85$, $\alpha(T2) = 0.88$, $\alpha(T3) = 0.87$), original mastery avoidance ($\alpha(T1) = 0.81$, $\alpha(T2) = 0.86$, $\alpha(T3) = 0.87$), original performance approach ($\alpha(T1) = 0.88$, $\alpha(T2) = 0.89$, $\alpha(T3) = 0.91$), and original performance avoidance ($\alpha(T1) = 0.86$, $\alpha(T2) = 0.91$, $\alpha(T3) = 0.91$).

[3] Specific a priori predictions were not made for these other focal cognitive and affective variables, but generally favorable and unfavorable patterns were anticipated for original mastery approach and performance avoidance goals, respectively.

[4] We also conducted an a priori power analysis using G*power. To run a multiple regression analysis with 4 predictors and 0.80 power to detect a small-to-medium effect size ($f^2 = 0.10$), the estimated minimum effect size was 125. We were able to gain access nearly 2.5 times this number of participants.

Table 4
Study 2: descriptive statistics.

	T1					T2					T3					
	M	*SD*	Min	Max	Skew	*M*	*SD*	Min	Max	Skew	*M*	*SD*	Min	Max	Skew	ICC
Achievement goals																
Original mastery approach	3.98	0.78	1.3	5.0	−0.75	3.88	0.85	1.0	5.0	−1.04	3.85	0.85	1.0	5.0	−0.88	0.84
Original mastery avoidance	3.42	0.91	1.0	5.0	−0.29	3.38	0.99	1.0	5.0	−0.49	3.37	0.93	1.0	5.0	−0.50	0.83
Original perf. approach	2.83	0.98	1.0	5.0	−0.10	2.84	1.05	1.0	5.0	−0.19	2.94	1.08	1.0	5.0	−0.19	0.88
Original perf. avoidance	3.01	0.99	1.0	5.0	−0.16	3.10	1.05	1.0	5.0	−0.30	3.10	1.04	1.0	5.0	−0.22	0.85
Other measures																
Exam performance	71.71	15.97	20.5	99.5	−0.74	68.41	18.92	13.5	98.0	−0.67	80.40	15.51	21.5	100.0	−1.35	0.89
Intrinsic motivation	5.17	1.11	1.0	7.0	−0.70	5.09	1.19	1.0	7.0	−0.64	5.20	1.18	1.0	7.0	−0.62	0.91
Test anxiety: worry	2.61	0.88	1.0	5.0	0.14	2.58	0.93	1.0	5.0	0.30	2.38	0.93	1.0	5.0	0.30	0.85
Test anxiety: emotionality	2.29	0.86	1.0	4.6	0.35	2.26	0.95	1.0	5.0	0.58	2.08	0.94	1.0	5.0	0.91	0.83
Absorption	4.29	0.94	1.8	6.8	0.12	4.29	1.00	1.7	7.0	0.17	4.28	0.98	1.8	7.0	0.14	0.90
Energy	2.50	0.86	1.0	4.4	−0.15	2.47	0.89	1.0	5.0	0.04	2.55	0.89	1.0	5.0	−0.06	0.85
Positive affect	2.93	0.82	1.0	5.0	−0.26	2.86	0.91	1.0	5.0	−0.11	2.90	0.87	1.0	5.0	−0.19	0.86
Negative affect	1.61	0.80	1.0	5.0	1.63	1.58	0.83	1.0	5.0	1.71	1.54	0.78	1.0	4.2	1.64	0.81

Note. N(T1) = 318. N(T2) = 314. N(T3) = 305. perf. = performance. Manifest between and within correlations are additionally provided in the Supplementary Materials.

3.1.2.2. Exam performance. Each exam was administered to participants in a classroom setting, and was a combination of multiple choice, fill-in-the-blank, and short answer questions. Scores on each exam could range from 0 to 100, and students were informed that their grades would be determined using a normative curve.

3.1.2.3. Intrinsic motivation. Intrinsic motivation was assessed using Elliot and Church's (1997) 8-item Intrinsic Motivation measure ("I am enjoying [name of the class] very much"). Participants made their ratings for each exam period of the class on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale, and scores were averaged to create the intrinsic motivation variables (α(T1) = 0.94, α(T2) = 0.94, α(T3) = 0.94).

3.1.2.4. Test anxiety. Test anxiety was assessed using the 10-item Revised Worry-Emotionality measure (Morris, Davis, & Hutchings, 1981). This measure assesses two constructs: worry (5 items, e.g., "I am afraid that I should have studied more for the test") and emotionality (5 items, e.g., "I have an uneasy, upset feeling"). Participants rated their thoughts and feelings about the exam for each exam period of the class on a 1 (*does not describe my condition*) to 5 (*describes my condition very well*) scale, and scores were averaged to create the worry (α(T1) = 0.84, α(T2) = 0.85, α(T3) = 0.85) and emotionality (α(T1) = 0.86, α(T2) = 0.90, α(T3) = 0.90) variables.

3.1.2.5. Absorption. Absorption was assessed using Elliot and Harackiewicz's (1996) 6-item task involvement measure (e.g., "In the class, I am totally absorbed in the lecture"). Participants rated the item for each exam period of the class on a 1 (*not at all true of me*) to 7 (*very true of me*) scale, and scores were averaged to create the absorption indexes (α(T1) = 0.74, α(T2) = 0.77, α(T3) = 0.78).

3.1.2.6. Energy. Energy was assessed using Thayer's (1986) 5-item Activation-Deactivation measure. Participants were asked to indicate how they felt while in the class (e.g., "energetic"), and responded for each exam period of the class on a 1 (*not at all true of me*) to 7 (*very true of me*) scale. Scores were averaged to form the energy indexes (α(T1) = 0.92, α(T2) = 0.93, α(T3) = 0.93).

3.1.2.7. Affect. Affect was assessed using Mackinnon et al.'s (1999) short form of the Positive and Negative Affect Schedule (Watson, Clark, & Tellegen, 1988). Participants rated how positive (5 items; e.g., "inspired") and negative (5 items; e.g., "distressed") they felt in the course for each exam period of the class on a 1 (*not agree at all*) to 7 (*very strongly agree*) scale. Scores were averaged to create the positive affect (α(T1) = 0.87, α(T2) = 0.89, α(T3) = 0.90) and negative affect (α(T1) = 0.91, α(T2) = 0.93, α(T3) = 0.94) indexes.

3.1.2.8. Response bias. Response bias was assessed using Paulhus' (1991) 20-item self-deceptive enhancement items from the Balanced Inventory of Desirable Responding (e.g., "I always know why I like things"). Participants rated each item on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale, and scores were averaged to create the response bias index (α = 0.72).

3.1.3. Analyses

In order to investigate the relations between the achievement goals and the dependent variables (exam performance, intrinsic motivation, worry, emotionality, absorption, energy, and positive and negative affect), we estimated two-level HLMs (three measurement points per person). We investigated each dependent variable in a single model by regressing it on the achievement goals, simultaneously estimating the between-person and within-person effects. We then repeated the analyses twice, once controlling for demographic variables (sex, school year, and GPA), and once controlling for response bias; this was done by including the control variables at the between-level of each model. We report the results from the models both with and without controlling the demographic and the response bias variables, so that the influence of these covariates on the final coefficients is clearly evident.

All analyses were conducted with Mplus, using MLR as an estimator. Missing data (< 5.9% per item) was imputed using the full information maximum likelihood estimator and the expectation-maximization algorithm (Peugh & Enders, 2004). For all analyses, standardized coefficients are reported.

3.2. Results

The descriptive statistics for all variables are reported in Table 4. We observed strong ICCs (0.81–0.91), indicating a high degree of stability in the achievement goals across the three time-points. For the regression analyses, consistent with the strong ICCs, the achievement goals were predictors of the dependent variables at the between-person level, but not the within-person level (see Table 5 for details of the between-persons results and Table S3 for details of the within-person results). We overview the findings from these regressions in the following.

The results revealed an adaptive pattern for original mastery approach goals. These goals were a positive predictor of exam performance, intrinsic motivation, absorption, and positive affect, and a

Table 5
Study 2: results of 2-level HLM analyses testing the predictive utility of the goals of the 2 × 2 SaS model.

	Exam performance	Intrinsic motivation	Test anxiety: worry	Test anxiety: emotionality
Between-person effects				
Original mastery approach	**0.31**/0.04/**0.33**	**0.48**/0.**45**/0.**49**	−0.21/−0.12/−0.12	−0.25/−0.20/−0.12
Original mastery avoidance	**−0.33**/0.01/**−0.34**	0.07/0.09/0.06	0.02/−0.12/−0.02	0.17/0.08/−0.02
Original performance approach	0.11/0.**14**/0.12	0.02/0.04/0.03	−0.12/−0.11/−0.09	0.03/0.05/−0.09
Original performance avoidance	0.15/−0.05/0.14	−0.11/−0.13/−0.12	**0.30**/0.**35**/0.**25**	0.12/0.14/0.25
R^2	**0.08**/0.**50**/0.**09**	**0.29**/0.**29**/0.**30**	**0.11**/0.**21**/0.**16**	**0.06**/0.**13**/0.**16**

	Absorption	Energy	Positive affect	Negative affect
Between-person effects				
Original mastery approach	**0.31**/0.**29**/0.**29**	−0.04/−0.02/−0.05	**0.33**/0.**32**/0.**34**	**−0.47**/**−0.36**/**−0.44**
Original mastery avoidance	0.21/0.23/0.22	**0.58**/0.**55**/0.**58**	0.24/0.25/0.24	**0.35**/0.21/0.**34**
Original performance approach	0.09/0.10/0.08	**0.44**/0.**44**/0.**44**	**0.28**/0.**29**/0.**28**	0.13/0.12/0.14
Original performance avoidance	−0.19 ≈ 0.21/−0.18	**−0.41**/**−0.40**/**−0.41**	−0.17/−0.18/−0.17	−0.06/0.02/−0.08
R^2	**0.25**/0.**25**/0.**24**	**0.30**/0.**30**/0.**30**	**0.33**/0.**33**/0.**33**	**0.09**/0.**16**/0.**09**

Note. $N = 324$. Presented are two-level regressions, simultaneously estimating the between-person effects and the within-person effects of achievement goals on the subsequently measured outcomes. Reported are the results of goals only (first entry in each column), goals with demographic variables (sex, school year, GPA) controlled (second entry in each column), and goals with response bias controlled (third entry in each column). Statistically significant coefficients are boldfaced. The within-person effects are provided in the Supplementary Materials (all within R^2 are statistically nonsignificant).

negative predictor of negative affect. Null results were observed for worry, emotionality, and energy.

A maladaptive pattern was observed for original performance avoidance goals. These goals were a positive predictor of worry, and a negative predictor of energy. Although there was a descriptive trend for these goals to negatively predict intrinsic motivation, absorption, and positive affect, these results did not reach statistical significance. Null results were also obtained for exam performance and negative affect.

The results revealed an adaptive pattern for original performance approach goals, albeit only for two dependent variables. These goals were a positive predictor of energy and positive affect; however they were unrelated to the other dependent variables.

Finally, original mastery avoidance goals evidenced a mixed (but mostly negative) pattern, as they were a positive predictor of energy and negative affect, and a negative predictor of exam performance.

The aforementioned results were highly consistent with those obtained in the supplementary analyses controlling for the demographic variables and response bias (see Table 5). All but two of the relations that were significant in the goals only analyses were significant in both of the control variable analyses. The exceptions were that original mastery avoidance goals were a significant negative predictor of exam performance and a significant positive predictor of negative affect in the goals only and response bias analyses, but were unrelated to exam performance and negative affect in the demographic variables analysis. All but one of the relations that were nonsignificant in the goals only analyses were nonsignificant in both of the control variable analyses. The exception was that performance approach goals were unrelated to exam performance in the goals only and response bias analyses, but were a positive predictor of exam performance in the demographic variables analysis.[5] In the Supplementary Materials we provide findings from analyses using other, ancillary data analytic approaches, namely, a structural equation modeling approach and a piecemeal (individual exam) regression approach.

[5] As a check of robustness across language comprehension, we also ran ancillary analyses in which we controlled for "learned English before age 5". The results reported in the text all held in these analyses. Furthermore, in addition to the HLM analyses reported in the text, we also ran an ancillary set HLM analyses in which we examined relations between the achievement goals and dependent variables controlling for the nested nature of the data, rather than specifically testing the between-person and within-person effects. The results from these analyses are similar to those reported in the text. Readers interested in the results from these analyses may contact the lead author.

In sum, Study 2 provided support for the predictive utility of the 2 × 2 SaS model, as each of the four achievement goals was linked to the focal dependent variables at the between-person level. As expected, based on consideration of both the conceptual components of the goals and existing empirical work, original mastery approach goals and original performance avoidance goals were linked to the most and least adaptive patterns, respectively. Original performance approach goals had an adaptive pattern as well, albeit predicting fewer dependent variables than their mastery-based counterparts. The least clear empirical pattern was obtained for original mastery avoidance goals, as they were linked to both positive and negative outcomes. The results were quite consistent across statistical controls.

4. General discussion

The results of the present research provide support for the 2 × 2 SaS model of achievement goals and the accompanying achievement goal questionnaire. Study 1 yielded factor analytic evidence that the hypothesized 2 × 2 SaS model fit the data better than a series of other plausible alternatives. Each of the four goal constructs had good internal consistency, and the intercorrelations among the goal variables showed both sensible covariation as a function of shared competence components and clear separation of the constructs. A series of multigroup factor analyses indicated that the hypothesized model was invariant across sex, ethnicity, and achievement domain, suggesting that the 2 × 2 questionnaire is well suited for comparative investigations (see Gregorich, 2006). Study 2 yielded evidence of the predictive utility of the four achievement goal constructs in the 2 × 2 SaS model. As expected, original mastery approach goals and original performance avoidance goals showed the most and least adaptive patterns, respectively, with original performance approach and mastery avoidance goals falling in between. These patterns were observed even when demographic variables (sex, year at school, GPA) and response bias were controlled. We summarize and discuss these patterns in the following.

4.1. Empirical patterns

Original mastery approach goals were found to positively predict exam performance and intrinsic motivation. These goals were also a positive predictor of absorption and positive affect, and a negative predictor of negative affect. This link to positive (and not negative) cognitive and affective experience is likely to sustain effort, commitment, and volition over time, which should support knowledge and skill

development. As such, these goals provide a strong, fertile motivational foundation that it is likely to yield many benefits over time (Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008; Midgley et al., 2001).

Original performance avoidance goals showed a descriptive trend toward negatively predicting intrinsic motivation, but this expected finding did not reach significance; these goals did not negatively predict exam performance, contrary to expectations. However, they were a positive predictor of worry and a negative predictor of energy. The weak relations observed for intrinsic motivation and exam performance are surprising, as data (including meta-analytic data) clearly show that the demonstration and avoidance components of achievement goals are problematic for both of these outcome variables (Hulleman et al., 2010; Senko & Dawson, 2017; van Yperen, Blaga, & Postmes, 2014). Thus, it seems that their combination should be particularly maladaptive. Additional research is needed to test the conditions under which these goals have their most and least harmful implications for intrinsic motivation and performance. Regardless, these goals were positively associated with worry and negatively associated with energy which would likely erode engagement, enjoyment, performance, and even participation over time (de Lange, van Yperen, van der Heijden, & Bal, 2010; Oertig et al., 2013; Roskes, De Dreu, & Nijstad, 2012; Sideridis, 2005). Thus, longitudinal work on these goals would also be of great benefit.

Original performance approach goals had a somewhat more beneficial empirical pattern than one might anticipate given their demonstration focus, albeit still far less positive than that for original mastery approach goals. These goals were a positive predictor of exam performance (albeit in only one of three analyses), energy, and positive affect, and were not linked to any maladaptive variables. It is possible that the negative implications of a demonstration focus found in other work (Grant & Dweck, 2003; Senko & Dawson, 2017; Warburton & Spray, 2014) are overcome, to some degree, when this general concern is coupled with (and channeled through) concrete, other-based appetitive standards that help proximally guide behavior. Alternatively, it is possible that in the particular context in which our study was conducted (a class with over 300 students) students were striving to demonstrate competence to themselves, which is likely less pressured on average, than striving to demonstrate competence to their teachers or parents (Ziegler, Dresel, & Stoeger, 2008). Finally, it may be that this achievement context was not difficult or important (i.e. ego involving) enough for students adopting these goals to be vulnerable to their potential problems; it may take encounters with failure (and accompanying low perceived competence) or high stakes for the downside of original performance approach goals to be manifest (see Dweck, 1986).

Original mastery avoidance goals, as is often the case for goals containing a combination of a development or self-based focus with an avoidance tendency, yielded the least clear empirical pattern. These goals were a negative predictor of exam performance, and were a positive predictor of energy and negative affect. That these goals were linked to a positive outcome, higher energy, may be due to the fact that they represent a combination of two components widely considered to be adaptive in achievement settings—a development focus and a self-based referent. That these goals were linked to some negative outcomes, lower exam performance and higher negative affect, may be due to the fact that they may not be an ideal fit to young adults in an introductory level classroom context in which the trajectory of competence development remains upward for the modal student. The fit may be better, and the predictive utility commensurately stronger, for older students or students in more advanced classes who may experience or perceive an age-related loss of skills or abilities or an asymptote in knowledge or understanding (de Lange et al., 2010; Freund, 2006; Senko & Freund, 2015).

A clear "take-home" (or "take-to-the-classroom") message for teachers and parents from these findings is to encourage students to pursue original mastery approach goals and to discourage them from pursuing original performance avoidance goals. The bi-component structure of the goals may provide a concrete guideline for how to encourage or discourage such goals. For example, teachers seeking to encourage original mastery approach goals would do well to highlight both the importance of developing competence over time *and* the importance of using self-based standards to do so.

Less clear is what message to convey regarding original performance approach and original mastery avoidance goals. The former goals yielded a somewhat positive pattern, but further research is needed before the full nomological network of these goals is clearly understood. Given the demonstration focus of these goals, especially, we anticipate that some negative implications will be found, as we indicated above. Furthermore, even if original performance approach goals turn out to be linked to a largely positive pattern of findings, one may still be reticent to embrace them on the grounds of one's meta-theoretical values (e.g., competence development over competence validation) or philosophy of education (e.g., students of all ability levels should have equal access to competence feedback; see Elliot & Moller, 2003). Thus, we anticipate that at best, the message will be to do nothing regarding original performance approach goals (i.e., neither encourage nor discourage them), but most likely it will be to actively discourage them. Regarding original mastery avoidance goals, much more research is needed before recommendations for teachers and parents can be generated.

4.2. Goals and goal complexes

We use the term "goal" in the present work to refer to the constructs in the 2 × 2 SaS model, because this is the term used in the early theorizing by Dweck (1986), Nicholls (1984a, 1984b), Ames (1992), and others. Another, more recently proffered term that may be used for these multi-component constructs is "goal complex" (Elliot & Thrash, 2001). A goal complex is a composite of an aim that is used to guide behavior and a reason that energizes behavior. A reason prompts the adoption of an aim, and together these reason-aim combinations create a third construct that is represented in memory as a goal complex. Goal complexes are beginning to receive more research attention in the achievement goal literature (Gaudreau & Braaten, 2016; Gillet, Lafrenière, Huyghebaert, & Fouquereau, 2015; Oz, Lane, & Michou, 2016; Senko & Tropiano, 2016; Sommet & Elliot, 2017; Vansteenkiste, Mouratidis, & Lens, 2010). To date, researchers have operationalized goal complexes in a way that emphasizes the functional relation between reason and aim. That is, goal complex items are typically worded using one of the following structures: "aim IN ORDER TO reason" or "aim BECAUSE reason". In the 2 × 2 SaS model, the constructs are worded in terms of the fully integrated and fused goal complex, rather than worded in a way that emphasizes the functional relation between the reason and aim. For example, an item in the 2 × 2 SaS questionnaire used to assess the original performance approach goal in Study 2 is "My goal is to demonstrate that my ability is better than others"; this item may be restated as follows to highlight the functional relation of the two competence components: "My goal is to do better than others in order to demonstrate my ability". Thus, the goals of the 2 × 2 SaS model contain both reason and aim content, but they represent this content in a fused reason-aim construct, the way it is presumed to be represented in memory and used in regulation (see Elliot & Thrash, 2001).

A noteworthy feature of the existing literature on achievement goal complexes is that nearly all of the research conducted to date has linked competence aims to reasons grounded in self-determination theory. For

example, Vansteenkiste et al. (2010) examined other-based standards grounded in autonomous reasons (e.g., "It is my goal to perform better than my direct opponent because this goal is a challenge"). The present research is one of the few to move beyond self-determination theory derived reasons to focus on reasons grounded in the development-demonstration distinction (see also Hodis et al., 2016), and, as noted earlier, it is the first to conceptualize and operationalize the original standpoint-standard combinations in systematic fashion, and to integrate these combinations with the approach-avoidance distinction.

4.3. Avenues for future research and limitations

In the present research we focused on the combination of a development standpoint with a self-based standard and the combination of a demonstration standpoint with an other-based standard. It is possible to conceive of two other standpoint-standard combinations, namely, a development standpoint with an other-based standard and a demonstration standpoint with a self-based standard. We focused on the former combinations because they represent the original dichotomous conceptualization; however, future work would do well to extend the focus to the latter combinations as well.

Furthermore, in the present research we used self-based standards to operationalize the original mastery approach and mastery avoidance variables. As noted by Elliot et al. (2011), mastery goals in the original theorizing were comprised of task-based standards as well as self-based standards. Task-based standards represent an absolute criterion with which to evaluate competence, and task-approach goals represent striving to accomplish the absolute demands of the task (e.g., get a math problem correct), whereas task-avoidance goals represent striving to avoid a failure to accomplish the absolute demands of the task (e.g., avoid getting a math problem wrong). These standards may be combined with development standpoints to create additional variants of original mastery approach and mastery avoidance goals. In the present research we started with the most straightforward and, we think, prototypic type of original mastery-based goal focused on a development standpoint and self-based standard, but future research would do well to additionally examine task-based variants of these goals to see if they yield any different findings.

More broadly, it is possible to consider a greater range of standpoint (demonstrate/develop), standard (task, self, other), and valence (approach/avoidance) combinations that comprise a diverse array of goal complexes (Hodis et al., 2016). Indeed, more broadly still, any given achievement aim may be undergirded by a myriad of reasons outside of the achievement domain (e.g., trying to do well compared to others *in order to* impress a romantic partner; Sommet & Elliot, 2017). It is in a) clearly delineating the difference between standpoints and standards, b) incorporating the approach-avoidance distinction, and c) articulating the reason-aim functional relation, that the achievement goal approach can simultaneously be systematic in describing achievement goal models and comprehensive in explaining the idiographic achievement goal regulation that takes place in everyday, real-world contexts.

Given the complexity of achievement goal models and achievement goal regulation, it is necessary to select a subset of goals or goal complexes in any empirical investigation. Our choice of goals herein was driven by historical considerations; we are not arguing that the goals that we studied in this work are more important than other achievement goals. Different goals have different foci and provide different information value in a given investigation as a function of the topic of primary interest. What is critical in empirical work is to clearly define and place in context the constructs, models, and measures of achievement goals (and goal complexes) that one uses; it is in so doing that this literature will yield clear, interpretable data that will advance the field on conceptual, empirical, and applied fronts.

Although the present studies have noteworthy strengths, such as relatively large sample sizes, multiple dependent variables (including a non-self-report variable and both affective and cognitive variables), and rigorous data collection (e.g., three separate time points) and data analytic procedures (e.g., controlling GPA and response bias), some limitations are also worthy of mention. First, we carefully attended to the temporal order of the predictor and dependent variables in Study 2, but the data were correlational in nature. As such, conclusions regarding causal relations among the Study 2 variables are not warranted, and subsequent longitudinal and experimental work is needed to address this issue. Second, all of the patterns found in Study 2 were observed with one sample of students in one achievement context; different patterns might be found in other samples and other contexts. Other samples will contain students with a different proportion of males and females, different levels of perceived competence, a different distribution of ethnicities, a different distribution of socioeconomic statuses, etc., all of which may influence which goals are adopted and the way that the adopted goals guide behavior and predict processes and outcomes. Likewise, other achievement contexts will differ in terms of the type of grading structure, harshness or ease of evaluation, interest and relevance of the course material, perceived competitiveness of one's fellow students, etc., all of which may influence goal adoption and predictive utility. Broadly stated, future work is needed to test the generalizability of the present results and to explore potential moderator variables.

4.4. Conclusion

A great deal of theoretical and empirical work has been done since the advent of the achievement goal approach to achievement motivation in the early 1980s. As often occurs when many different theorists and researchers work in a given area, research accumulates and advances are made in a piecemeal rather than systematic and integrated fashion. As such, on occasion it is necessary to step back to take the "forest view" of the literature that allows a reassessment of where we have been and where it would be optimal for us to go. Our reassessment herein led us to the conclusion that, surprisingly, there is little known at present about the originally articulated achievement goals due to a lack of conceptual clarity about the multi-component nature of these goals and a lack of clear operationalization, accordingly. In our research we sought to rectify this problem by carefully reviewing the existing literature, placing the 2 × 2 SaS achievement goal model in historical context, creating an instrument to assess the goals of this model, and using these goals to predict important achievement-relevant processes and outcomes. Furthermore, we have elucidated theoretical connections between the original goal constructs and the goal complex constructs that are proving highly generative in the contemporary literature. With the added conceptual clarity and newly validated measure from the present research, we believe that a foundation is firmly in place for fruitful empirical work on the original achievement goal conceptualization, and on achievement goal complexes more generally.

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Appendix 1

Study 1: items and descriptive statistics for the 2 × 2 standpoints and standards (SaS) measure.

Items	*M*	*SD*	Min	Max	Skew	α/r_{it}
Original mastery approach						**0.82**
I am striving to develop my personal knowledge over time	4.27	0.79	2.00	5.00	−0.88	0.70
My aim is to develop my individual ability over time	4.19	0.83	1.00	5.00	−1.06	0.63
My aim is to increase my own competence over time	4.23	0.82	2.00	5.00	−0.90	0.69
Original mastery avoidance						**0.73**
I am striving to avoid losing my own knowledge over time	3.52	0.92	1.00	5.00	−0.54	0.55
My goal is to avoid a decrease in my individual ability over time	3.61	1.06	1.00	5.00	−0.75	0.63
My goal is to avoid becoming less personally competent over time	3.36	1.12	1.00	5.00	−0.38	0.57
Original performance approach						**0.88**
I am striving to demonstrate my knowledge compared to others	3.20	1.13	1.00	5.00	−0.27	0.78
My aim is to demonstrate that my ability is better than others	3.23	1.15	1.00	5.00	−0.27	0.77
I am striving to show that I am more competent than others	3.25	1.12	1.00	5.00	−0.12	0.76
Original performance avoidance						**0.79**
My goal is to avoid showing that I lack knowledge relative to others	3.53	1.13	1.00	5.00	−0.62	0.64
My aim is to avoid demonstrating that my ability is worse than others	3.32	1.15	1.00	5.00	−0.41	0.63
My goal is to avoid demonstrating that I lack competence compared to others	3.15	1.13	1.00	5.00	−0.21	0.64

Note. In Study 1, three different stems were used ("My goal is", "My aim is", and "I am striving") prior to the standpoint and standard content; in Study 2, the same stem ("My goal is") was used for all items, rather than synonyms (i.e., using "aim" or "striving"). The items were answered on a 1 (*not at all true of me*) to 5 (*extremely true of me*) scale. The descriptive results from Study 1 (N = 342) are presented. α/r_{it} represents Cronbach Alpha for the subscales (presented in bold) and the item-total correlation for the individual items.

Appendix 2. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.lindif.2019.04.009.

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