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The trichotomous achievement goal model and intrinsic motivation: a sequential mediational analysis

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Abstract

This experiment was designed to extend the research by Elliot and Harackiewicz (1996) on the trichotomous achievement goal model in several important ways and to more thoroughly document the processes through which the goals in the trichotomous model influence intrinsic motivation. Results indicated that performance–avoidance goals undermined intrinsic motivation relative to performance–approach and mastery goals; the latter goals evidenced the same intrinsic motivation. These results were obtained using highly evaluative performance goal manipulations, with early adolescent participants, and for a motor task relevant to physical ability. Sequential mediational analyses revealed that competence valuation, state anxiety, and task absorption processes accounted for the observed effects. Perceived competence served neither mediating nor moderating roles. © 2002 Elsevier Science (USA). All rights reserved.

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Over the past two decades, the achievement goal approach to achievement motivation has become the predominant conceptual framework used to study behavior in school, sport, and work settings. Achievement goals are defined as the purpose or cognitive-dynamic focus of competence-relevant activity (Elliot, 1999; Maehr, 1984) and the specific goal adopted is posited to influence how individuals interpret and experience achievement settings (Dweck, 1986; Nicholls, 1984). Initially, achievement goal theorists used a performance–mastery goal dichotomy in accounting for competence-based strivings; in recent years, this dichotomous model has been extended to a trichotomous model comprising performance–approach (focused on attaining normative competence), performance–avoidance (focused on avoiding normative incompetence), and mastery (focused on task mastery or improvement) goals (Elliot, 1997; Elliot & Harackiewicz, 1996).

Intrinsic motivation is an outcome variable of central importance to the achievement goal literature, as individual's interest in and enjoyment of an activity for its own sake (Deci & Ryan, 1985) is presumed to influence long-term performance and persistence in achievement settings (Harackiewicz, Baron, Tauer, & Elliot, in press; Vallerand, Fortier, & Guay, 1997). Proponents of the dichotomous achievement goal model have contended that performance goals, relative to mastery goals, should undermine intrinsic motivation (Ames, 1992), but the extant experimental research has produced a mixed yield (Rawsthorne & Elliot, 1999).

From the standpoint of the trichotomous model, the reason for this mixed empirical yield is the failure to differentiate performance–approach and performance–avoidance goals, which are presumed to have divergent effects on intrinsic motivation. Specifically, performance–avoidance goals are posited to undermine intrinsic motivation, whereas performance–approach goals are not (Elliot, 1997). The only research to put the trichotomous model to test in an experimental context is the intrinsic motivation work conducted by Elliot and Harackiewicz (1996). In their research with undergraduate participants,

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Elliot and Harackiewicz (1996) instantiated each of the goals in the trichotomous model and observed the effect of the manipulations on intrinsic motivation for a puzzle solving activity. The results supported the trichotomous model. Performance–avoidance goals undermined intrinsic motivation, relative to performance–approach and mastery goals; the latter, approach, goals evidenced the same intrinsic motivation. Mediational results indicated that task absorption accounted for the observed effects. Relative to performance–approach and mastery goals, performance–avoidance goals reduced task absorption, which, in turn, undermined intrinsic motivation. The two approach goals promoted task absorption (and, consequently, intrinsic motivation) to the same degree.

The present research had two primary aims. First, we sought to extend the direct effects documented by Elliot and Harackiewicz (1996) in several important ways. The manipulations used in the prior work were relatively weak (see Rawsthorne & Elliot, 1999, for a discussion of the strength/weakness of goal manipulations) and it could be argued that a performance–approach goal manipulation with a stronger evaluative focus will undermine intrinsic motivation (see Grant & Dweck, 2002). Highly evaluative performance–goal manipulations were used in the present research to examine this issue. In addition, college-age participants were used in the prior work and it could be argued that performance–approach goals are only beneficial for individuals, like undergraduates, with extensive experience in normative evaluative contexts (see Midgley, Kaplan, & Middleton, 2001). Early adolescents (13–15-years-old) served as participants in the present research to examine this issue. Finally, a perceptual-cognitive task (hidden figure puzzles) relevant to intellectual ability was used as the experimental activity in the prior work and the generalizabilty of the findings to other types of tasks and abilities remains an open question. A motor task (basketball dribbling) relevant to physical ability was used in the present research to address this issue.

The second aim of the present research was to more thoroughly examine the processes through which the three achievement goals influence intrinsic motivation. Elliot and Harackiewicz (1996) documented task absorption as a mediator variable, but a number of other processes are undoubtedly operative and need empirical attention if a clear understanding of the relationship between achievement goals and intrinsic motivation is to be acquired. The experimental investigations in the intrinsic motivation literature that have explored multiple paths in process-based analyses (see Baron & Harackiewicz, 2001; Elliot et al., 2000; Harackiewicz & Elliot, 1998; Reeve & Deci, 1996) have clearly revealed that attending to a single explanatory path is incomplete at best and can even be misleading. In the present research, we investigated the role of four potential mediator variables: competence valuation, task absorption, state anxiety, and perceived competence.

Competence valuation represents the importance a person places on attaining competence and *task absorption* represents concentration on and cognitive immersion in an activity. These variables reflect an affective and cognitive involvement in task performance (respectively) and both variables have been shown to facilitate intrinsic motivation (Elliot & Harackiewicz, 1996; Harackiewicz & Manderlink, 1984). In achievement settings, *state anxiety* represents feelings of nervousness or apprehension about evaluation and, to the best of our knowledge, this variable has yet to be examined as a mediator in experimental work on intrinsic motivation. State anxiety is an aversive phenomenological experience that is likely to be inimical to intrinsic motivation. *Perceived competence* represents an individual's belief about whether he or she has or is able to perform well at an activity; it is an important intrapsychic resource that clearly facilitates the development of intrinsic motivation, but has been found to be less central to the maintenance of intrinsic motivation (Harackiewicz & Sansone, 1991).

In the present study, we assessed competence valuation and state anxiety, prior to task engagement, task absorption at the mid-point of task engagement, and perceived competence at the beginning, mid-point, and conclusion of task engagement. We hypothesized that the failure-focus of performance–avoidance goals would lead to a self-protective divestment from competence, heightened apprehension about the impending evaluative event, and reduced task absorption during task performance. In contrast, the success-focus of both performance–approach and mastery goals was predicted to foster an investment in attaining competence, mitigate apprehension about evaluation, and facilitate task absorption. No perceived competence effects were anticipated (given our use of an already enjoyable activity and our provision of positive feedback to all participants; see Harackiewicz & Sansone, 1991) and the hypothesized effects were expected to be observed across levels of perceived competence.

We not only examined the role of multiple mediators in the present research, but we also investigated sequential mediational processes. Specifically, we hypothesized that performance–avoidance goals would lead to low competence valuation and state anxiety, prior to task engagement, and that this divestment from competence and apprehension about evaluation would disrupt absorption in the task during engagement, which, in turn, would undermine intrinsic motivation for the task. In contrast, we predicted that both performance–approach and mastery goals would facilitate competence valuation and mitigate state anxiety, which would promote task absorption, which, in turn, would foster intrinsic motivation. Again, we anticipated that

these processes would be observed, independent of perceived competence. Few intrinsic motivation experiments have documented sequential mediation; doing so would greatly enhance our understanding of how achievement goals exert their influence on intrinsic motivation.

Method

Participants

Forty-five male and 45 female 13–15-years-old French physical education students voluntarily participated in the experiment. Participants were blocked on gender and randomly assigned to one of the three experimental conditions.

The experimental activity

The experimental task was a basketball dribbling activity, the object of which was to dribble a basketball through a course of obstacles as quickly as possible over two separate trials. This activity has been used in previous intrinsic motivation research (Cury, Biddle, Sarrazin, & Famose, 1997) and pilot testing has indicated that children find the activity enjoyable, desire to perform it competently, and consider a 2 min 30 s finishing time a good performance. Participants had learned how to play basketball in their physical education class, but the dribbling activity was a novel task for all.

Procedure

Participants were run individually by a male experimenter who was unaware of the experimental condition and the hypotheses being tested. Upon the participant's arrival at the laboratory, the experimenter introduced the basketball dribbling activity verbally and through demonstration. The experimenter then announced that he needed to leave for a few minutes to check on another participant and that the participant could do whatever he or she wanted, including dribbling on the course, reading basketball magazines, or nothing at all. During this free-choice period, the participant's behavior was monitored by an observer hidden in an adjoining room and the time the participant spent on the course was recorded. When 5 min had elapsed, the experimenter returned and handed the participant a written goal manipulation.

Participants in the two *performance goal* conditions read the following:

> This research is being conducted in collaboration with the French Basketball Federation in order to better understand how teenage students play basketball, and the focus of today's session is on dribbling. The intention is to compare French students to one another on their technical level of dribbling, which is estimated by their time taken to complete the course.

Performance-approach participants additionally read:

> This course has been set up and used all over France in order to identify and select the students at each school with the best dribbling. You will be videotaped and the tape of the students with the best times will be shown to the other students at your school. There are two trials and the object is to try to go as fast as possible. If your performance is better than a majority of students, you will demonstrate that you have a good technical level of dribbling.

In contrast, *performance–avoidance* participants additionally read:

> This course has been set up and used all over France in order to identify students' most important errors in dribbling. You will be videotaped and the tape of the students with the worst times will be shown to the other students at your school so they can see the errors to avoid. There are two trials and the object is to try to go as fast as possible. If your performance is worse than a majority of students, you will demonstrate that you have a poor technical level of dribbling.

In both *performance goal* conditions, participants were also informed:

> When you have finished your two attempts, you will be provided with information regarding your time taken to complete the course and how you performed compared to other students.

Participants in the *mastery* goal condition read the following:

> This research is being conducted in collaboration with the French Basketball Federation in order to better understand how teenage students play basketball, and the focus of today's session is on dribbling. The intention is to assess the teaching quality of the course in order to use it to teach dribbling in school. This course has been set up and used all over France. The aim of this session is to see if you can quickly improve your dribbling. There are two trials and the object is to go as fast as possible. When you have finished your two attempts, you will be provided with information regarding your time taken to complete the course.

After the manipulation, the participant was asked to indicate the purpose of the session as a manipulation check. Immediately before task engagement, the participant completed measures of competence valuation, state anxiety, and perceived competence. The participant then completed the two trials on the dribbling course. Between trials, the participant completed measures of task absorption and perceived competence, and was given 4 min to rest. At the end of the second trial, all participants received positive task-based and normative feedback for the two trials: "Your time is less than 2 min and 30 s, and this time represents a good performance compared to that of other students" (actual performance data was not obtained in this experiment).

The experimenter then announced that he needed to leave again, to check on another participant, and that the participant could do whatever he or she wanted, including dribbling on the course, reading basketball magazines, or nothing at all. During this free-choice period, the participant's behavior was again monitored by the hidden observer and the time the participant spent on the course was recorded. When 5 min had elapsed, the experimenter returned and presented the participant with a perceived competence measure. On completion of the measure, the participant was dismissed. Debriefing was conducted in a separate session with participants and their parents.

Measures

Manipulation check. Manipulation check items focusing on each goal were adapted from Cury et al. (1997): performance–approach (''The purpose of this session is to select the students with the best technical level of dribbling compared to others''), performance–avoidance (''The purpose of this session is to select the students with the worst technical level of dribbling compared to others''), and mastery (''The purpose of this session is to test a learning method designed to improve dribbling''). Participants responded on a 1 (no agreement at all) to 5 (agree completely) scale.

Intrinsic motivation. The amount of time participants spent on the course during the two free-choice periods served as the Time 1 and Time 2 intrinsic motivation (IM) indicators. Behavioral measures of this type have been used, since the onset of intrinsic motivation research (Deci, 1971).

Competence valuation. Elliot et al.'s (2000) two-item measure was used to assess competence valuation (e.g., ''I care very much about how I do on the course''). Participants responded on a 1 (strongly disagree) to 7 (strongly agree) scale ($\alpha = .82$).

State anxiety. Thill and Cury's (2000) four-item measure was used to assess state anxiety (e.g., ''I am experiencing unpleasant feelings (stomach in knots, sweaty hands ...''). Participants responded on a 1 (not at all) to 5 (very much) scale ($\alpha = .82$).

Task absorption. The six items used in Elliot & Harackiewicz's (1996) experiments were used to assess task absorption (e.g., ''I was totally absorbed in my dribbling''). Participants responded on a 1 (strongly disagree) to 7 (strongly agree) scale ($\alpha = .81$).

Perceived competence. Three single-item measures were used to assess perceived competence (PC) over the course of task engagement (see Elliot & Harackiewicz, 1996, for similar items): pre-performance PC (''How do you think you will do on the course today?''), mid-performance PC (''How do you think you did on the first trial?''), and post-performance PC (''How do you think you did on the two trials?''). Participants responded on a 1 (very poorly) to 7 (very well) scale.

Results

Manipulation check

Multivariate analyses of the manipulation check items yielded clear evidence of the efficacy of the manipulations. For example, the comparison of the mastery and performance–approach conditions was significant, Wilk's Lambda = .09, Rao's $R(3, 85) = 302.67$, $p < .001$; mastery goal participants agreed more with the mastery goal item ($M = 4.76$) than performance–approach goal participants ($M = 1.66$; $F[1, 87] = 491.16$, $p < .001$ and agreed less with the performance–approach goal item ($M = 1.30$) than performance–approach goal participants ($M = 4.43$; $F[1, 87] = 471.61$, $p < .001$). The same nature and magnitude of differences were observed when comparing the mastery and performance–avoidance conditions, and the performance–approach and performance–avoidance conditions (Wilk's Lambdas $\geqslant .07$, Rao's Rs > 300, Fs > 400, ps $< .001$, and mean differences $\geqslant 2.93$).

Overview

The zero-order correlations among the primary variables in the experiment are presented in Table 1. Simultaneous regression analyses were conducted to investigate the hypotheses. In accord with Elliot & Harackiewicz (1996), a set of orthogonal contrasts were used in initial analyses: the performance–mastery contrast compared the performance goal conditions (−1) to the mastery goal condition (+2) and the approach–avoidance contrast compared the performance–approach (+1) and performance–avoidance goal conditions (−1). These contrasts, along with Time 1 IM, comprised the basic regression model. When analyses with the basic model revealed a significant approach–avoidance effect, two separate planned comparisons anchored the performance–approach and performance–avoidance goal conditions to the mastery goal condition: the approach–mastery contrast compared the performance–approach (−1) and mastery (+1) goal conditions, and the avoidance–mastery contrast compared the performance–avoidance (−1) and mastery (+1) goal conditions. Time 1 IM was included in these ancillary analyses.[1]

Preliminary analyses examined the main and interactive effects of gender. No gender effects were observed, so gender was excluded from further consideration.

[1] All of the results reported in the text are essentially identical (i.e., all βs $\geqslant$ or within .01 of those in the text) when Time 1 IM is omitted from the equations.

Table 1
Zero-order correlations among primary variables

	1	2	3	4	5	6	7	8	9	10	11
1. Performance-mastery contrast	—										
2. Approach-avoidance contrast	—	—									
3. Approach-mastery contrast	—	—	—								
4. Avoidance-mastery contrast	—	—	—	—							
5. Pre-performance perceived competence	−.02	.01	.03	−.01	—						
6. Mid-performance perceived competence	−.01	.07	.04	.03	.07	—					
7. Post-performance perceived competence	−.02	−.13	−.05	−.08	−.08	.19	—				
8. Time 2 IM	.34**	.45**	−.07	.52**	−.12	.14	.07	—			
9. Competence valuation	.17	.46**	.08	.38**	.08	.15	−.09	.49**	—		
10. State anxiety	−.28**	−.25*	.11	−.36**	−.09	−.01	−.07	−.46**	−.16	–	
11. Task absorption	.16	.41**	.06	.34**	.08	.17	.12	.59**	.48**	−.23*	–

Note. IM, intrinsic motivation. *$p < .05$, **$p < .01$. The correlations between the contrast variables are ommited because these relationships are of little conceptual value.

Achievement goals to intrinsic motivation

The first set of analyses examined the direct effect of achievement goals on intrinsic motivation (see Table 2 for Time 2 IM means). Regressing Time 2 IM on the basic model yielded a significant overall model, $F(3, 86) = 15.61$, $p < .001$, $R^2 = .35$. The performance–mastery ($\beta = .33$, $p < .001$) and approach–avoidance ($\beta = .46$, $p < .001$) contrasts were significant, indicating that mastery goal participants dribbled longer than performance goal participants and performance–approach goal participants dribbled longer than performance–avoidance goal participants. Time 1 IM was also a positive predictor of Time 2 IM ($\beta = .18$, $p < .05$). Planned comparisons revealed an avoidance–mastery effect ($\beta = .51$, $p < .001$), indicating that mastery goal participants dribbled longer than performance–avoidance goal participants. No difference was observed between the performance–approach and mastery goal conditions.

Achievement goals to mediators

Having established the direct effects, we next examined the link between the achievement goals and the potential mediators (see Table 2 for mediator means). Regressing competence valuation on the basic model yielded a significant overall model, $F(3, 86) = 9.99$, $p < .001$, $R^2 = .51$. The approach–avoidance contrast was significant ($\beta = .47$, $p < .001$), indicating that performance–approach goal participants reported greater competence valuation than performance–avoidance goal participants. Planned comparisons revealed an avoidance–mastery effect ($\beta = .37$, $p < .001$), indicating that mastery goal participants reported greater competence valuation than performance–avoidance goal participants. No difference was observed between the performance–approach and mastery goal conditions.

Regressing state anxiety on the basic model yielded a significant overall model, $F(3, 86) = 5.69$, $p < .01$,

Table 2
Means for time 2 IM, competence valuation, state anxiety, task absorption, and the three PC variables by experimental condition

Dependent measure	Experimental condition		
	Performance-approach goal	Performance-avoidance goal	Mastery goal
Time 2 IM	158.35_a	67.65_b	162.86_a
Competence valuation	6.32_a	5.07_b	6.11_a
State anxiety	3.12_a	3.63_b	2.89_a
Task absorption	4.52_a	3.38_b	4.34_a
Pre-performance PC	4.70_a	4.60_a	4.63_a
Mid-performance PC	4.53_a	4.30_a	4.66_a
Post-performance PC	4.76_a	4.60_a	5.06_a

Note. IM, intrinsic motivation; PC, perceived competence. Within each dependent measure, means not sharing common subscripts are significantly different from each other ($p < .05$ at minimum; Fisher's least significant difference test). Time 2 IM values ranged from 0 s (did not dribble on the course at all during the free-choice period) to 300 s (dribbled on the course during the entire free-choice period). Competence valuation had a possible range of 1 (low) to 7 (high). State anxiety had possible range of 1 (low) to 5 (high). Task absorption had a possible range of 1 (low) to 7 (high). The three PC variables had a possible range of 1 (very poorly) to 7 (very well). Time 1 IM is residualized from the tabled Time 2 IM values. Standard deviations were 79.75, 1.12, 0.84, 1.14, 0.95, 0.85, and 1.09 for Time 2 IM, competence valuation, state anxiety, task absorption, pre-performance PC, mid-performance PC, and post-performance PC, respectively.

$R^2 = .17$. The performance–mastery ($\beta = -.26$, $p < .01$) and approach–avoidance ($\beta = -.26$, $p < .01$) contrasts were significant, indicating that mastery goal participants reported less anxiety than performance goal participants, and performance–approach goal participants reported less anxiety than performance–avoidance goal participants. Planned comparisons revealed an avoidance–mastery effect, ($\beta = -.36$, $p < .001$), indicating that mastery goal participants reported less anxiety than performance–avoidance goal participants. No difference was observed between the performance–approach and mastery goal conditions.

Regressing task absorption on the basic model yielded a significant overall model, $F(3, 86) = 8.69$, $p < .001$, $R^2 = .23$. The approach–avoidance contrast was significant ($\beta = .42$, $p < .001$), indicating that performance–approach goal participants reported greater task absorption than performance–avoidance goal participants. Time 1 IM was also a significant positive predictor of task absorption ($\beta = .21$, $p < .05$). The planned comparisons revealed an avoidance–mastery effect ($\beta = .34$, $p < .001$), indicating that mastery goal participants reported greater task absorption than performance–avoidance goal participants. No difference was observed between the performance–approach and mastery goal conditions.

The regression analyses with the three PC measures failed to yield any significant experimental effects. Thus, the three PC variables cannot be considered further as mediational variables.[2]

Having established the first link in the mediational chain, we next examined competence valuation and state anxiety as mediators of the achievement goal to task absorption relationship. Regressing task absorption on the basic model with competence valuation and state anxiety included yielded a significant overall model, $F(5, 84) = 7.53$, $p < .01$, $R^2 = .31$ (increment in $R^2 = .08$, $p < .05$). Competence valuation ($\beta = .32$, $p < .01$), but not state anxiety, was a positive predictor of task absorption and inclusion of the mediator variables reduced the beta for the approach–avoidance effect from .42 to .25 ($p < .05$). Regressing task absorption on the avoidance–mastery contrast with competence valuation and state anxiety included yielded a significant overall model, $F(4, 85) = 8.32$, $p < .05$, $R^2 = .28$ (increment in $R^2 = .13$, $p < .001$). Competence valuation ($\beta = .39$, $p < .001$), but not state anxiety, was a positive predictor of task absorption and inclusion of the mediator variables reduced the beta for the approach–avoidance effect from .34 to .16 (ns). Thus, competence valuation was validated as a partial mediator of the approach–avoidance and avoidance–mastery effects (see Judd & Kenny, 1981, for the requirements for documenting mediation of experimental effects).

Final mediational analyses

The final link in the mediational chain was tested by regressing Time 2 intrinsic motivation on the basic model with competence valuation, state anxiety, and task absorption included. The overall model was significant, $F(6, 83) = 16.99$, $p < .001$, $R^2 = .55$ (increment in $R^2 = .20$, $p < .001$). Each mediator variable had a significant influence on Time 2 IM: participants with greater competence valuation ($\beta = .18$, $p < .05$), less state anxiety ($\beta = -.25$, $p < .01$), and greater task absorption ($\beta = .34$, $p < .001$) evidenced greater intrinsic motivation. Inclusion of the mediator variables reduced the beta for the performance–mastery effect from .33 to .18 ($p < .05$) and reduced the beta for the approach–avoidance effect from .46 to .17 (ns). Thus, competence valuation, state anxiety, and task absorption were validated as partial, sequential mediators of the performance–mastery and approach–avoidance effects.

Mediation of the avoidance–mastery effect was examined by regressing Time 2 intrinsic motivation on the avoidance–mastery contrast with the potential mediators included. The overall model was significant, $F(5, 84) = 20.42$, $p < .001$, $R^2 = .55$ (increment in $R^2 = .25$, $p < .001$. Each mediator variable had a significant influence on Time 2 IM: participants with greater competence valuation ($\beta = .19$, $p < .05$), less state anxiety ($\beta = -.26$, $p < .01$), and greater task absorption ($\beta = .35$, $p < .001$) evidenced greater intrinsic motivation. Inclusion of the mediator variables reduced the beta for the avoidance–mastery effect from .51 to .23 ($p < .01$). Thus, competence valuation, state anxiety, and task absorption were validated as partial, sequential mediators of the avoidance–mastery effect (see Figs. 1a and b for pictorial summaries of the approach–avoidance and avoidance–mastery mediation.[3]

Discussion

The results from the present research provide additional support for the trichotomous achievement goal model. In accord with Elliot and Harackiewicz (1996), performance–avoidance goals undermined intrinsic motivation relative to performance–approach and mas-

[2] We also examined the moderating role of perceived competence (PC) in the achievement goal to intrinsic motivation relationship by repeating each intrinsic motivation analysis with one of the three PC variables and its corresponding PC interactions included in the equation. No significant PC interactions were obtained in these analyses and all of the significant effects reported in the text remained significant. Clearly, the effects documented herein are independent of PC processes.

[3] Sobel's tests were significant ($p < .05$ at minimum) for each of the mediational processes documented in the text.

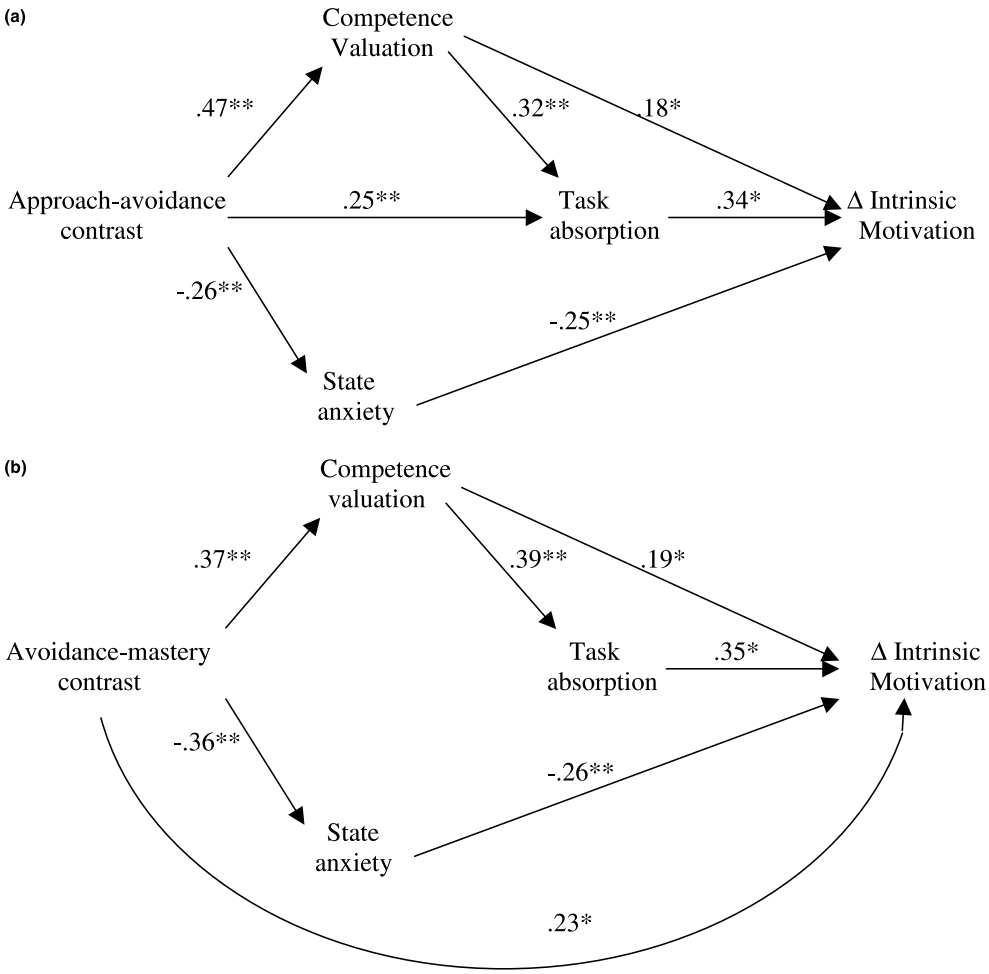

Fig. 1. (a) The sequential mediational model for the approach–avoidance contrast (performance–approach = +1, performance–avoidance = −1); (b) The sequential mediational model for the avoidance–mastery contrast (mastery = +1; performance–avoidance = −1). Path values are standardized regression coefficients from the regression analyses. *$p < .05$; **$p < .01$.

tery goals, whereas performance–approach and mastery goals displayed the same level of intrinsic motivation. These effects were independent of participants' perceptions of competence throughout the course of task engagement and were even demonstrated controlling for participants' pre-experiment level of intrinsic motivation. These findings nicely extend the generalizability of the trichotomous model by demonstrating that performance–approach goals can have a positive effect on intrinsic motivation under highly evaluative (as well as mildly evaluative) conditions, with early adolescent (as well as undergraduate) participants, and for motor tasks relevant to physical ability (as well as for perceptual-cognitive tasks relevant to intellectual ability). Thus, assertions that the benefits of performance–approach goals are limited to highly constrained conditions (see Midgley et al., 2001) would appear to be unfounded.

Nevertheless, it is important to state that there are certainly instances in which performance–approach and mastery goals have divergent effects and in which the pursuit of performance–approach goals has deleterious consequences. For example, in the face of failure, performance–approach goals may be more likely than mastery goals to lead to reduced intrinsic motivation (most likely by prompting the adoption of performance–avoidance goals). On the other hand, performance–approach goals sometimes yield benefits that mastery goals do not (see Elliot & Church, 1997; Harackiewicz, Baron, & Elliot, 1998) and may even yield positive effects when mastery goals yield negative. For example, performance–approach goals may facilitate giving up and moving on when repeated efforts on an unsolvable task prove unfruitful, whereas mastery goals may lead to counterproductive persistence in this instance (see Janoff-Bulman & Brickman, 1982; McFarlin, Baumeister, & Blascovich, 1984). We are hard-pressed to come up with an example in which performance–avoidance goals are beneficial, although such unusual situations may exist. Additional experimental work is clearly needed to reveal further the costs and benefits of pursuing the different achievement

goals in the trichotomous model (as well as the recently proposed 2 × 2 framework, see Elliot & McGregor, 2001).

Our mediational findings provided an explanation for how the direct effects of achievement goals on intrinsic motivation occurred. Three different variables were shown to have a mediational role: competence valuation, state anxiety, and task absorption. Performance-avoidance, relative to performance–approach and mastery goals, reduced competence valuation, which in turn undermined intrinsic motivation. This explanatory path suggests that focusing on the possibility of failure may prompt individuals to divest from competence in a self-protective manner, and although this affective divestment may minimize the sting of failure, it does so at the cost of eroding the desire for subsequent task engagement. Self-protective competence valuation processes of this sort may underlie such broad and invidious social problems as high school drop-out (Vallerand et al., 1997) and African American underachievement (Ogbu, 1992; Steele & Aronson, 1995). For example, in discussing the latter issue, Steele & Aronson (1995) argued that "protective disidentification" from intellectual activities is likely to have "the byproduct of diminishing interest, motivation, and, ultimately, achievement" (p. 797).

Performance-avoidance, relative to performance–approach and mastery, goals also increased participants' state anxiety, resulting in decreased intrinsic motivation. This path suggests that focusing on the possibility of failure evokes evaluation apprehension in individuals and that this phenomenologically aversive experience undercuts the desire for subsequent task engagement. Researchers in the voluminous test anxiety literature have unequivocally demonstrated the deleterious effects of evaluation apprehension on a variety of outcomes, but they have predominantly attended to quantitative outcomes such as performance attainment rather than qualitative outcomes such as intrinsic motivation (Hembree, 1988). Our findings document that experiencing state anxiety in achievement settings is antithetical to intrinsic motivation for achievement tasks or, as White (1959) presciently stated, "anxiety is the enemy of exploratory play" (p. 315).

Finally, performance–avoidance, relative to performance–approach and mastery, goals also reduced task absorption, which, in turn, undermined intrinsic motivation. This finding replicated that of Elliot & Harackiewicz (1996) but, unlike prior research, we also documented *how* this mediation occurs by examining sequential mediational processes. Specifically, it appears that focusing on the possibility of failure prompted a self-protective divestment from competence, this divestment interfered with participants' absorption in the task, and this lack of absorption then undercut intrinsic motivation. Although one might expect state anxiety to similarly mediate the link between achievement goals and task absorption, state anxiety did not interfere with task absorption in this setting. Our state anxiety measure included aspects of both emotionality (physiological and affective reactions) and worry (cognitive concern; see Liebert & Morris, 1967), and it is possible that worry, but not emotionality, has a negative impact on task absorption, much like worry, but not emotionality, has a negative impact on performance attainment (Elliot & McGregor, 1999; Morris, Davis, & Hutchings, 1981). Subsequent research is needed to clarify this issue.

The contrasts between performance–approach and performance–avoidance goals, and between performance–avoidance and mastery goals, were shown to influence intrinsic motivation through highly similar processes (see Figs. 1a and b). However, for the mastery-avoidance, but not the approach–avoidance, contrast the direct effect on intrinsic motivation remained significant, even after accounting for the mediational role of competence valuation, state anxiety, and task absorption. This suggests that an additional mediational process is operative and we think a likely candidate is self-determination. Mastery, but not necessarily performance–approach, goals may be optimal facilitators of perceived autonomy throughout task engagement (Elliot & McGregor, 2001; McGregor and Elliot, 2001) and perceived autonomy has been shown to support intrinsic motivation (Deci & Ryan, 1990). Parenthetically, the mediational results for the contrast between omnibus performance goals (collapsed across valence) and mastery goals highlight further the value of the trichotomous model: only a single process variable, state anxiety, was documented as a mediator of the performance–mastery contrast, whereas multiple explanatory paths were documented with the approach–avoidance and avoidance–mastery contrasts.

The documentation of sequential mediation in the present research yielded a more fine-grained understanding of mediational processes than that typically seen in intrinsic motivation research. Despite the obvious benefits of sequential mediational investigations, they remain rare in the field. For example, we believe that the present research represents only the second demonstration of sequential mediation of a behavioral intrinsic motivation effect in the literature (see Harackiewicz & Elliot, 1998) and it represents the first time that both positive and negative intrinsic motivation processes have been validated together in the same mediational model, sequential or otherwise. We encourage other researchers within and beyond the intrinsic motivation literature to make use of this rich and fruitful approach to examining mediational mechanisms.

In closing, the present research bears testimony to the utility of the approach–avoidance distinction in the achievement motivation domain. Theoretically, the present work shows how approach and avoidance forms of regulation evoke processes before task engagement even begins that eventuate in inimical consequences for in-

trinsic motivation. Pragmatically, the present work indicates the need for intervention in school, sport, and work settings to encourage individuals to adopt approach rather than avoidance goals in their achievement pursuits.

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