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# Perceiving school performance as instrumental to future goal attainment: Effects on graded performance

Ariel Malka\* and Martin V. Covington

*University of California, Berkeley, CA, USA*

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## Abstract

Three studies examined the perception among college students that school performance is instrumental to future goal attainment. Study 1, an exploratory study involving free report goal assessments, indicated that perceived instrumentality (PI) is a subjectively salient aspect of college students' achievement motivation. Study 2 provided evidence for the structural distinctiveness of PI from self-efficacy, task value, and the achievement goals, and also demonstrated that PI prospectively predicts unique variance in graded performance beyond that accounted for by these motivational variables. Study 3 demonstrated that PI prospectively predicts unique variance in graded performance independently of future time orientation. We argue that a comprehensive understanding of the purposes underlying classroom achievement behavior requires consideration of how school performance may be perceived as instrumental to the attainment of valued life goals.

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## 1. Introduction

Goal perspectives on motivation focus on the mental representations of desired outcomes that initiate and direct behavior (Austin & Vancouver, 1996; Emmons, 1997; Ford & Nichols, 1987). Goals can be very broad in scope (e.g., be helpful to everyone) or very narrow (e.g., be helpful to my parents) and, in a similar vein, can be

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\* Corresponding author.

*E-mail address:* [amalka@socrates.berkeley.edu](mailto:amalka@socrates.berkeley.edu) (A. Malka).

long in duration (e.g., become a successful businessperson after college) or short in duration (e.g., get an A on a business administration exam). Goals of these various levels are organized hierarchically such that goals at a relatively abstract/long-term level (e.g., be respected by others) give rise to goals at a lower level (e.g., become a doctor) which in turn engender goals at an even lower level (e.g., get an A in a biology course), all the way to the level of specific muscle tensions (Carver & Scheier, 1982; Miller, Galanter, & Pribram, 1986). From a goal perspective, to understand a person's behavior one must be mindful of the goals existing at multiple levels of abstraction to which the current behavior is perceived as instrumental.

When college students enter a classroom they do not leave their goal systems at the door. Like other activity, behaviors such as reading textbooks, studying for exams, and writing papers are embedded in the hierarchical goal systems of individuals. Mental representations of getting into graduate school, being a successful businessperson, having a fulfilling career, and even, in some instances, having quality relationships and contributing to the greater good (see Urdan & Maehr, 1995) often give rise to the more specific scholastic goals pursued by students. Studies examining perceived instrumentality (PI) in classroom situations have addressed this perception of connectedness between current classroom behavior and desired future outcomes (Husman, Derryberry, Crowson, & Lomax, 2004; Husman & Lens, 1999; Miller, Greene, Montalvo, Ravindran, & Nichols, 1996). However, most modern achievement motivation research, particularly that conducted within the achievement goal perspective (e.g., Elliot & McGregor, 2001; Pintrich, 2000), focuses on motivational variables that are not directly relevant to PI. The primary aims of the present research are to: (1) examine whether PI represents a subjectively salient and empirically distinct motivator of college students' achievement behavior and (2) assess the ability of PI to prospectively predict unique variance in graded performance independently of other commonly studied motivational variables.

### 1.1. Perceived instrumentality in achievement motivation

The construct of PI played a prominent role in the classic expectancy-value theories of motivation (Atkinson, 1957; Vroom, 1964). According to these theories, motivation to act in a situation is a function of the sum of the expectancy-value products across all incentives operative in that situation. In these formulations, expectancy is analogous to perceived instrumentality of a behavior to a *proximal* goal, similar to perceiving an internal control of reinforcement (Rotter, 1990). Vroom (1964) addressed the perceived instrumentality of behavior to distal future goals as well as proximal goals. Specifically, Vroom proposed that the *valence* of a proximal outcome (e.g., an A on an exam) is a function of the perceived instrumentality of the proximal outcome to distal future outcomes (e.g., the belief that getting an A will increase one's chances of becoming a successful lawyer) multiplied by the value of these future outcomes (e.g., the desirability of becoming a successful lawyer), summed across all relevant future outcomes. However, because a single proximal goal may be perceived as instrumental to a boundless number of distal outcomes, direct empirical translations

of this theory in field settings are impractical. Acknowledging this difficulty, Atkinson (1957) studied behavior in “ideal achievement-related situations,” in which no incentives are operative besides pure achievement-related satisfaction. In his elaboration of Atkinson’s theory, Raynor addressed the motivational relevance of perceiving performance on an immediate task to be part of a contingent path leading to future achievement opportunities (Raynor, 1969; Raynor & Rubin, 1971). This research took a step towards addressing PI as a motivator of achievement behavior but was limited in that it only dealt with perceived instrumentality of performance to attaining future achievement opportunities—a narrow sample of the goals to which performance may be perceived as instrumental.

The construct of PI has more recently been addressed by future time perspective theorists (Lens, 1986; Nuttin & Lens, 1985). Based on this work, educational psychologists have begun to examine the role of PI in motivating achievement behavior in classroom environments (Husman & Lens, 1999; Miller, DeBacker, & Greene, 1999). While most of this research has involved testing the relations between measures of PI and other self-report measures (e.g., Husman et al., 2004; Miller et al., 1999), some of this work has investigated the effect of PI on graded performance. Results indicate that PI positively predicts graded performance (De Volder & Lens, 1982; Miller et al., 1996; Raynor, 1970; VanCalster, Lens, & Nuttin, 1987).

### 1.2. Achievement Goal Theory

Achievement Goal Theory focuses on a different type of goal from that conceptualized in general goal perspectives and PI research (Ames, 1992; Dweck, 1986). In this approach, goals specifically related to how students define achievement in terms of competence are posited as the relevant motivational units (Pintrich, 2000). Classic achievement goal theory posits two goals—the performance goal and the mastery goal. The performance goal, which is aimed at *demonstrating* that one has ability, is associated with the belief that to achieve is to prove one’s competence. The mastery goal, which is aimed at *developing* ability, corresponds with the belief that to achieve is to master a skill or improve one’s competence. Although achievement goals have been shown to predict a host of school-related outcomes (e.g., Diener & Dweck, 1978; Meece, Blumenfeld, & Hoyle, 1988; Nolen, 1988), neither the mastery nor the performance goal has emerged as a strong or consistent predictor of graded performance (e.g., Pintrich & Garcia, 1991). Recently, Elliot and colleagues proposed an elaborated  $2 \times 2$  achievement goal framework in which the traditional performance and mastery goals are each conceptualized as possessing independent approach and avoidance aspects (Elliot & McGregor, 2001). Research employing this framework has shown that the performance-approach goal—aimed at proving high ability—is positively associated with performance, whereas the performance-avoidance goal—aimed at avoiding the demonstration of low ability—is negatively related to performance (Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot, McGregor, & Gable, 1999). Thus with the incorporation of an approach–avoidance distinction, the achievement goal approach gained the capacity to reliably predict graded performance.

### 1.3. Perceived instrumentality and achievement goals

Achievement goals are both conceptually and empirically distinct from the types of goals represented by PI (Husman et al., 2004; Miller et al., 1999; Pintrich, 2000). Recently, Elliot and Thrash (2001) proposed a model that clarifies the relationship between these distinct goal constructs (also see Simons, Dewitte, & Lens, 2000). Specifically, these researchers proposed that the achievement goals adopted in classroom situations are ultimately rooted in students' larger life goals. For example, the desire to become a doctor (a major life goal) may motivate a student to try to outperform her peers (the performance-approach goal). Elliot and Thrash (2001) acknowledge that the larger goals that underlie the achievement goals remain operative in achievement situations, even after they have lead to achievement goal adoption. In other words, students retain some sense of connectedness between their classroom behavior and the higher-order goals that they wish to attain, even while their behavior is filtered through one or more achievement goals. This theorizing raises two questions. First, relative to the achievement goals, how accessible are the future goals represented by PI as motivators of achievement behavior? Second, does PI contribute to the prediction of variance in graded performance independently of the achievement goals?

A straightforward way to explore the relative accessibility of PI as a motivator of achievement behavior is to instruct students to generate a list of school-related goals and then code these spontaneously generated goals for motivational content (see Emmons, 1986; Little, 1983). Harackiewicz, Barron, Carter, Lehto, and Elliot (1997) applied this methodology and found a small proportion (10%) of what they labeled "external" concerns, which were heavily outnumbered by both performance and mastery goals. It should be noted, however, that these researchers did not explicitly discourage subjects from reporting proximal motivators of achievement behavior, as opposed to general underlying purposes (see Pintrich, 2000), and, therefore, obtained reports of the desire to get good grades as a goal. Grade goals were then categorized as performance goals rather than external goals—a practice consistent with the assumption that wanting good grades is exclusively linked with the concern with demonstrating competence. While students might often pursue grade goals out of concern with demonstrating competence, they might also pursue such goals as a means to attaining future aspirations that are not directly related to the demonstration of competence. Therefore, more research is necessary for examining: (1) the proportion of instrumental goals that students generate under instructions that clearly define the goal unit of interest as an *underlying purpose* and (2) the degree to which students perceive the proximal goal of getting good grades as rooted in performance or instrumental concerns.

The sparse research addressing whether PI predicts graded performance independently of the achievement goals has yielded mixed evidence (Miller et al., 1996). This may be because this research has not assessed the approach and avoidance aspects of the achievement goals independently. As discussed, only achievement goal measures that distinguish approach and avoidance aspects of achievement motivation have been shown to reliably predict graded performance (Elliot & Church, 1997; Elliot &

McGregor, 2001). Therefore, in addition to assessing the distinctiveness of PI from the achievement goals posited in the  $2 \times 2$  model, it would be useful to test whether PI prospectively predicts unique variance in graded performance independently of these achievement goals.

#### *1.4. Perceived instrumentality and other prominent motivational constructs: Task value, self-efficacy, and future time orientation*

Task value, or students' evaluations of how important, interesting, and useful they find the course material to be (Pintrich, Smith, Garcia, & McKeachie, 1991), is conceptually similar to PI and may play a role in the effect of PI on performance (see Husman et al., 2004). Task value has been conceptualized as a superordinate construct of which PI is one component (Wigfield & Eccles, 2000). Some research, however, suggests that PI and task value are structurally distinct but correlated (Husman et al., 2004; Miller et al., 1999). To establish that PI is a construct worthy of theoretical attention, it would be useful to reexamine the distinctiveness of PI from task value, and to test whether PI prospectively predicts unique variance in graded performance independently of task value.

Self-efficacy, or perceived competence, has consistently emerged as a predictor of graded performance (Pintrich & Garcia, 1991). Research has yielded inconsistent evidence regarding the relationship between PI and self-efficacy (Lens & Decruyenaere, 1991; Shell & Husman, 2001) as well as the ability of PI to predict unique variance in performance independently of self-efficacy (Miller et al., 1996). It would make sense for students to feel more competent with regard to coursework that they experience as instrumental to future goal attainment. Therefore, to make a case for PI, it would be useful to demonstrate PI's distinctiveness from self-efficacy and ability to predict unique variance in performance beyond self-efficacy.

Finally, some researchers have conceptualized PI as part of a broader motivational construct labeled future time orientation (FTO; alternatively labeled future time perspective), defined as the degree to which one's current behavior is influenced by future concerns (Gjesme, 1983). This approach assumes that individuals can be more or less influenced by long-term, as opposed to immediate, concerns, and that this broad orientation has two components. The *valence* component of FTO represents individual differences in the value ascribed to future goals. The *connectedness* component of FTO represents individual differences in the general perception that current behavior will have implications for future goal attainment—or *global*, as opposed to *task-specific*, PI (De Volder & Lens, 1982; Husman & Lens, 1999; Shell & Husman, 2001). Both the expectancy-value and future time perspective frameworks suggest that the combination of valuing future goals and viewing current behavior as instrumental to their attainment should have an impact on performance (Lens & Decruyenaere, 1991; VanCalster et al., 1987; Vroom, 1964). It remains uncertain whether PI with regard to a specific course predicts variance in performance beyond the two FTO components and their interaction.

### 1.5. The present research

The present research examines whether: (1) PI is a *salient* and *independent* component of students' consciously accessible motivation to perform coursework and (2) PI adds *predictive utility* beyond that captured by the achievement goals and other prominent motivational variables. Study 1 was an exploratory study aimed at addressing the relative accessibility of instrumental goals as motivators of college students' achievement behavior and as the source of their proximal goal to get good grades. This study involved free report goal assessments. Study 2 was conducted in a large college classroom setting and served to: (1) test the empirical distinctiveness of PI from well-established measures of task value, self-efficacy, and the four goals posited in the elaborated  $2 \times 2$  achievement goal model and (2) assess whether PI prospectively predicts unique variance in graded performance beyond these motivational variables. Study 3 was also conducted in a college classroom setting and was primarily aimed at testing the ability of PI to predict unique variance in graded performance independently of FTO valence, FTO connectedness, and their interaction.

## 2. Study 1

Study 1 was an exploratory study that addressed the degree to which college students report that their: (1) academic achievement behavior and (2) desire to get good grades are motivated by performance, mastery/intrinsic, and instrumental goals.

### 2.1. Method

#### 2.1.1. Overview

Participants completed single-page forms on which they were asked to list their school-related goals. We instructed one group of participants to freely report up to 10 "underlying reasons" why they are "motivated to do their coursework" in courses generally (*coursework instructions*). Mindful that the goal of getting good grades is probably the most accessible school-related goal for college students, we explicitly informed participants receiving these instructions that "we are NOT interested in immediate goals such as getting good grades." We included a second set of instructions in which students were asked to report up to 10 underlying reasons why they "want to get good grades" in their courses (*grades instructions*) in order to explicitly address the degree to which the proximal desire to get good grades is rooted in performance or instrumental goals.

#### 2.1.2. Participants

Participants were 133 undergraduate students from a large, ethnically diverse West Coast state university who completed this study to partially fulfill a requirement for their psychology courses. A form containing the coursework instructions was administered to 64 (24 female, 36 male, and 4 unknown) participants and a form containing the grades instructions was administered to 69 (34 female, 30 male, and 5 unknown) participants.

### 2.1.3. Goal coding

Two coders implemented a coding system that categorized each freely reported goal as either *instrumental*, *performance*, or *mastery/intrinsic*. Goals were categorized as instrumental if they had to do with realizing future goals such as having a good job, helping to make the world a better place, earning high income, and getting into graduate school. Goals were categorized as performance if they had to do with proving ability, bolstering self-worth, living up to expectations, avoiding appearing unintelligent, or any other concern pertaining to the demonstration of competence to oneself or others. Finally, goals having to do with mastering course material for its own sake, feeling fulfillment, enjoying the experience of learning, or feeling intellectual stimulation were categorized as mastery/intrinsic. The agreement percentage across two coders was 93.6% and disagreements were resolved through discussion. Examples of freely reported goals coded for each category are: “have a secure future” and “get into grad school” (instrumental), “prove myself” and “making my parents proud” (performance), and “once in a while it’s actually interesting” and “to broaden my knowledge and learn things that interest me” (mastery/intrinsic).

### 2.2. Results and discussion

The mean number of goals and mean percentage of total goals per subject coded for each category are displayed in Table 1. For the average participant who received the coursework instructions, 27.0% of the goals reported were instrumental, 31.5% were performance, and 41.5% were mastery/intrinsic. Instrumental goals, though less frequently reported than performance and mastery goals, were identified by students as an important motivator of their classroom achievement behavior. It is worth noting that the proportion of goals coded instrumental in this study is higher than what would be expected based on the Harackiewicz et al. (1997) free report findings. This is likely due to the fact that these researchers did not explicitly discourage subjects from reporting the desire to get good grades as a goal and then coded grade goals as performance goals. The current findings suggest that when goals are explicitly defined as the underlying purposes of classroom behavior, the accessibility of instrumental goals as motivators of achievement behavior is substantially higher.

To more directly address the degree to which instrumental goals are identified as sources of the proximal desire to get good grades, we included the grades instructions

Table 1  
Study 1: mean number and percentage of goals per subject coded for each category

	Coursework instructions			Grades instructions		
	Instrumental	Performance	Mastery/ intrinsic	Instrumental	Performance	Mastery/ intrinsic
Number of goals per subject	1.39	1.70	2.22	1.88	2.43	0.91
% of total goals per subject	27.0%	31.5%	41.5%	35.1%	47.0%	17.9%

Note.  $N = 133$  ( $n = 64$  for coursework instructions and 69 for grades instructions).

described earlier. For the average participant who received the grades instructions, 35.1% of the goals reported were instrumental, 47.0% were performance, and 17.9% were mastery/intrinsic. Based on these findings, it appears that instrumental goals are often identified as reasons for wanting to get good grades. Although a higher proportion of the underlying reasons for wanting good grades had to do with performance concerns, these findings challenge the implicit assumption that the desire to get good grades is exclusively part of the performance goal domain.

### 3. Study 2

Having established that instrumental goals are an important part of why college students do their work and want good grades, we sought to investigate whether: (1) PI is structurally distinct from task value, self-efficacy, and the achievement goals and (2) PI has an impact on graded performance above and beyond that accounted for by these motivational variables.

#### 3.1. Method

##### 3.1.1. Overview

We conducted Study 2 in the context of a large introductory psychology course at the same university described in Study 1. Participants completed a questionnaire packet in research sessions outside of class in order to partially fulfill a research participation requirement. All participants completed the questionnaire prior to the first examination.

##### 3.1.2. Participants

Participants were 195 (132 female and 63 male) students enrolled in the course described above. Most participants were either 18 or 19 years old ( $M = 18.7$ ). The ethnicity breakdown was 48.7% Asian, 35.9% Caucasian, 4.1% Latino, 2.1% African American, and 9.2% other or unreported. Approximately 29% of participants indicated that they were likely to major in psychology.

##### 3.1.3. Measures

**3.1.3.1. Perceived instrumentality.** PI was assessed with a measure developed by Miller et al. (1999). This measure contains five items assessing the perception that outcomes in a specific course are instrumental to attaining valued future goals. In establishing this measure, Miller and colleagues demonstrated its structural distinctiveness from their own measures of the traditional performance and mastery goals as well as intrinsic and extrinsic task valuing. Initial exploratory factor analyses indicated that one of the PI items loaded more strongly on the task value factor and the mastery-approach factor than the PI factor. We, therefore, excluded this item and established a four-item PI scale. Of these four items, two items assess perceived instrumentality of *achievement* (e.g., “I do the work assigned in this class because my

achievement is important for attaining my dreams”) and two items assess perceived instrumentality of *learning* (e.g., “I do the work assigned in this class because learning the content plays a role in reaching my future goals”). Participants rated the PI items on a 1 (“Not at all true of me”) to 7 (“Very true of me”) scale ( $M = 5.15$ ,  $SD = 1.22$ ,  $\alpha = .88$ ).

*3.1.3.2. Task value.* Participants completed the task value subscale of the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich et al., 1991). This measure contains six items, with two items each assessing how interesting, important, and useful participants perceive the course material to be (e.g., “I think the course material in this class is useful for me to learn”). Task value items were rated on a 1 (“Not at all true of me”) to 7 (“Very true of me”) scale ( $M = 5.78$ ,  $SD = .99$ ,  $\alpha = .91$ ).

*3.1.3.3. Self-efficacy.* Participants completed the self-efficacy subscale of the MSLQ (Pintrich et al., 1991). This measure contains eight items, four of which assess grade expectancy (e.g., “I believe I will receive an excellent grade in this class”) and four of which assess perceived ability with regard to the course (e.g., “I’m certain I can master the skills being taught in this class”). Self-efficacy items were rated on a 1 (“Not at all true of me”) to 7 (“Very true of me”) scale ( $M = 5.39$ ,  $SD = .92$ ,  $\alpha = .91$ ).

*3.1.3.4. Achievement goals.* The four achievement goals that comprise the  $2 \times 2$  model—performance-approach, performance-avoidance, mastery-approach, and mastery-avoidance—were assessed with Elliot and McGregor’s (2001) achievement goal measure. Participants rated the three items comprising each achievement goal subscale on a 1 (“Not at all true of me”) to 7 (“Very true of me”) scale. Sample items for each subscale are: “It is important for me to do better than other students” (performance-approach;  $M = 4.67$ ,  $SD = 1.58$ ,  $\alpha = .92$ ); “My fear of performing poorly in this class is often what motivates me” (performance-avoidance;  $M = 5.02$ ,  $SD = 1.50$ ,  $\alpha = .82$ ); “I want to learn as much as possible from this class” (mastery-approach;  $M = 5.25$ ,  $SD = 1.20$ ,  $\alpha = .85$ ); and “I worry that I may not learn all that I possibly could in this class” (mastery-avoidance;  $M = 4.35$ ,  $SD = 1.45$ ,  $\alpha = .83$ ).

*3.1.3.5. Graded performance.* Grades were determined based on performance on two non-cumulative midterm examinations (each worth approximately 16.7% of the final grade), a cumulative final examination (worth approximately 33.3% of the final grade), attendance in mandatory discussion sections outside of the main lecture (worth 5% of the final grade), a term paper (worth approximately 16.7% of the final grade), and a research participation requirement (worth approximately 11.7% of the final grade). Graded performance was operationalized as the percentage of total possible points obtained ( $M = 82.05$ ,  $SD = 8.39$ ).

*3.1.3.6. Control variables.* Participants reported the following demographic information: sex, ethnicity, and year in school. Participants also rated how certain they are that they will major in psychology on a 1 (“No, definitely not”) to 5 (“Yes, definitely”) scale ( $M = 2.92$ ,  $SD = 1.11$ ).

### 3.2. Results

#### 3.2.1. Confirmatory factor analyses

Confirmatory factor analyses (CFAs) were conducted using Amos 5 (Arbuckle, 2003) to test the empirical distinctiveness of PI from task value, self-efficacy, and the four achievement goals. The CFA models were fit to covariance matrices and parameters were generated with maximum likelihood estimation. The hypothesized model, displayed in Fig. 1, specified that each of the 30 motivational items loads exclusively on its associated latent variable.<sup>1</sup> The fit of this model was adequate based on conventional standards ( $\chi^2/df=1.91$ ; Root Mean Square Error of Approximation (RMSEA)=.068; Incremental Fit Index (IFI) =.92; Comparative Fit Index (CFI)=.92), although the  $\chi^2$  value was significant at this sample size ( $\chi^2(367, N=195)=700.99, p < .001$ ) (see Bentler & Bonett, 1980; Hoyle & Panter, 1995).

In addition, six alternative models were fit to the data and compared to the hypothesized model. Each alternative model depicted the four PI items loading on one of the other latent motivational variables rather than comprising their own factor (e.g., PI and Task value combined). As displayed in Table 2, the hypothesized model provided a significantly better fit to the data than each of the six alternative models.

#### 3.2.2. Preliminary analyses

Prior to conducting the main regression analysis, we tested for sex, ethnicity, year in school, and certainty of major differences in graded performance. Only ethnicity differences were found. Caucasians performed better than Asian Americans to a marginally significant extent;  $r = -.15, p = .06$ ; and both Caucasians and Asian Americans performed significantly better than the remaining ethnic groups;  $r$ 's = .48 and .34, respectively,  $p$ 's < .001. The remaining ethnic groups did not significantly differ from one another. To represent the effects of ethnicity, we included two ethnicity vectors in the main regression analysis.

#### 3.2.3. Regression analysis

To test the hypothesis that PI prospectively predicts unique variance in graded performance independently of the other motivational variables, we regressed graded performance on task value, self-efficacy, and the four achievement goals at step 1,

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<sup>1</sup> Within the PI, self-efficacy, and task value variables, certain error terms were permitted to covary based on the presumption that their associated items would share variance independent of their respective factors. Specifically, the errors associated with the two PI items that assess perceived instrumentality of achievement were permitted to covary, as were the errors associated with the two PI items that assess perceived instrumentality of learning. Within the self-efficacy scale, the errors associated with the four items assessing grade expectancy were permitted to covary, as were the errors associated with the four items assessing perceived ability. Finally, within the task value scale, the errors associated with the pair of items assessing interest, the pair of items assessing usefulness, and the pair of items assessing importance were each permitted to covary. These error terms were permitted to covary in both the hypothesized model and the alternative models, and thus provided neither with an advantage.

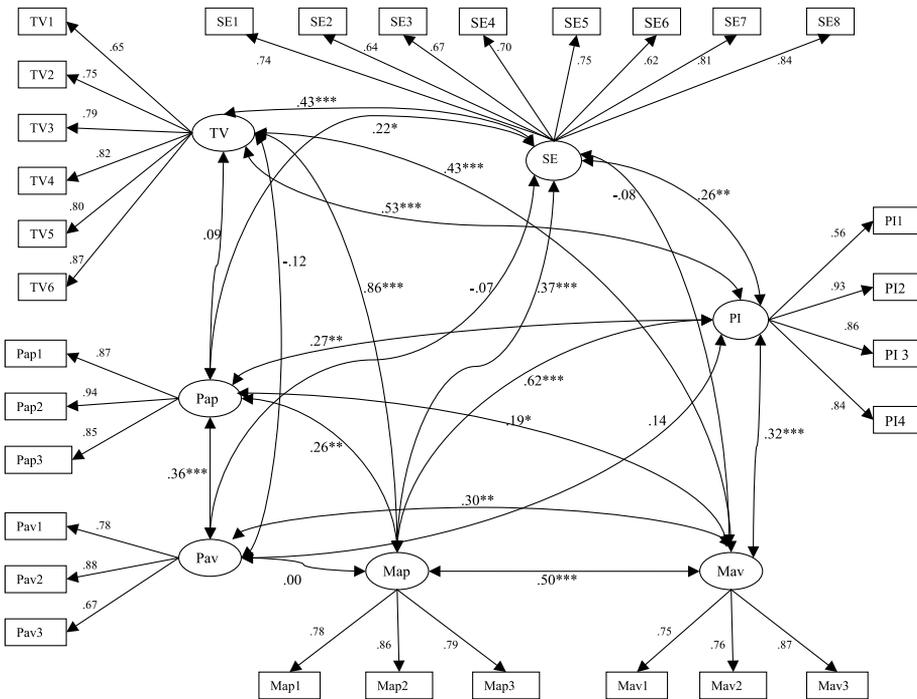


Fig. 1. Study 2: hypothesized confirmatory factor analysis model. PI, perceived instrumentality; SE, self-efficacy; TV, task value; Pap, performance-approach; Pav, performance-avoidance; Map, mastery-approach; and Mav, mastery-avoidance. Parameter estimates are standardized. Residual terms as well as covariances among specific residual terms are not represented in the figure. All factor loadings are significant at  $p < .001$ . For the correlations among the latent variables: \* $p < .05$ , \*\* $p < .01$ , and \*\*\* $p < .001$ .

Table 2  
Study 2: confirmatory factor analysis model comparisons assessing the structural distinctiveness of perceived instrumentality

Model	Hierarchical $\chi^2$ test (comparison with hypothesized model depicting PI as an independent factor)
Task value and PI combined	$\Delta\chi^2(6) = 184.99^{***}$
Self-efficacy and PI combined	$\Delta\chi^2(6) = 255.05^{***}$
Performance-approach and PI combined	$\Delta\chi^2(6) = 264.77^{***}$
Performance-avoidance and PI combined	$\Delta\chi^2(6) = 288.35^{***}$
Mastery-approach and PI combined	$\Delta\chi^2(6) = 147.38^{***}$
Mastery-avoidance and PI combined	$\Delta\chi^2(6) = 248.49^{***}$

Note.  $N = 195$ .  
\*\*\* $p < .001$ .

and added PI at step 2. As mentioned, we also controlled for two vectors representing the effects of ethnicity. The results of this analysis are displayed in Table 3. At step 1, a significant positive main effect was found for self-efficacy;  $\beta = .15, p < .05$ ; and a significant negative main effect was found for performance-avoidance;  $\beta = -.16, p < .05$ . Also, a near-significant positive main effect was found for performance-

Table 3  
Study 2: regression and structural equation analysis predicting graded performance

Step	Predictor	Regression analysis $\beta$	Standardized estimates from structural equation models	
			Correlated predictors	Independent predictors
1	Task value	-.10	-.20	-.09
	Self-efficacy	.15*	.17†	.13*
	Performance-approach	.15†	.10	.09
	Performance-avoidance	-.16*	-.24**	-.22**
	Mastery-approach	.16	.13	.06
	Mastery-avoidance	-.07	-.10	-.11
2	Perceived instrumentality	.19*	.22*	.22**

Note. The regression analysis also included two ethnicity vectors. For the full regression model,  $F(9, 185) = 5.44, p < .001, R^2 = .21, N = 195$ .

\*  $p < .05$ .

\*\*  $p \leq .01$ .

†  $p < .10$

approach;  $\beta = .15, p = .055$ . At step 2, PI had a significant positive main effect;  $\beta = .19, p < .05$ . This confirmed the hypothesis that PI prospectively predicts unique variance in graded performance.

### 3.2.4. Structural equation analysis

Structural equation modeling was used to estimate the effects of latent variables representing PI and the six remaining motivational constructs on graded performance. Using the same program and methods described in Section 3.2.1, we estimated the parameters in a model depicting the seven latent motivational variables—PI, task value, self-efficacy, and the four achievement goals—as predictors of graded performance. Each item was modeled as an indicator of its respective latent motivational variable.<sup>2</sup> Parameter estimates for the effects of each latent motivational variable on performance are displayed in Table 3. In one analysis, the latent motivational variables were permitted to covary, and in a second analysis, the relations among the latent motivational variables were fixed to zero. Not surprisingly, the model in which the latent motivational variables were allowed to covary provided an adequate fit to the data ( $\chi^2/df = 1.88$ ; RMSEA = .067; IFI = .92; CFI = .92) whereas the model in which these covariances were fixed to zero fell short of some conventional standards for an adequate fit ( $\chi^2/df = 2.73$ ; RMSEA = .095; IFI = .83; CFI = .83). More importantly, the effect of PI on graded performance was significant in both the correlated predictors model;  $\beta = .22, p < .05$ ; and the independent predictors model;  $\beta = .22, p < .01$ . These findings mirror those of the regression analysis indicating that PI accounts for unique variance in graded performance.

<sup>2</sup> The error terms associated with the PI, task value, and self-efficacy items that were permitted to covary in the CFAs were also permitted to covary in these models.

### 3.3. *Brief discussion*

The results of Study 2 indicate that PI is empirically distinguishable from established measures of self-efficacy, task value, and the four goals comprising the elaborated achievement goal model. Furthermore, Study 2 showed that PI prospectively predicts variance in graded performance above and beyond that accounted for by these motivational variables. It should be noted, however, that the PI measure used in this study assessed the perception that performance in a particular course is instrumental to valued future goal attainment. It is reasonable to argue that this scale is confounded by a general tendency to place strong emphasis on one's future (Gjesme, 1983), which may account for the effect of PI on performance. Study 3 was conducted to address this possibility.

## 4. Study 3

As discussed earlier, the construct of FTO is conceptualized as having both connectedness and valence components. The connectedness component represents global, as opposed to task-specific, PI and the valence component represents a general tendency to value future goals. According to expectancy-value (Vroom, 1964) and future time perspective (Nuttin & Lens, 1985) models of motivation, the connectedness and valence components of FTO may interactively predict performance. Specifically, to the degree that a person generally values future goals, perceiving connectedness between current behavior and future goals should produce greater motivation. We conducted Study 3 to test the alternative hypothesis that the effect of PI on performance is merely attributable to a general tendency to be future-focused, as indicated by the two FTO components and their interaction. A secondary purpose of Study 3 was to replicate the finding of Study 2 that PI's effect on performance is not attributable to the achievement goals, task value, and/or self-efficacy.

### 4.1. *Method*

#### 4.1.1. *Overview*

Study 3 was conducted within an intensive 6-week summer personality psychology course at the same university described in Studies 1 and 2. Participants volunteered to complete the questionnaire packet containing this study's measures. All participants completed their questionnaires prior to the first examination.

#### 4.1.2. *Participants*

Ninety-one (55 female and 36 male) students in the course described above served as this study's participants. The mean age among participants was 22.1 years. The ethnicity breakdown was 46.2% Asian, 27.5% Caucasian, 3.3% Latino, 1.1% African American, and 22% other or unreported. Approximately 50% of participants indicated that they were likely to major in psychology.

### 4.1.3. Measures

**4.1.3.1. Perceived instrumentality, task value, self-efficacy, and the achievement goals.** The four-item PI scale used in Study 2 (Miller et al., 1999) was administered to participants ( $M = 4.98$ ,  $SD = 1.31$ ,  $\alpha = .88$ ). Also as in Study 2, participants completed the task value ( $M = 5.73$ ,  $SD = .88$ ,  $\alpha = .90$ ) and self-efficacy ( $M = 5.42$ ,  $SD = .92$ ,  $\alpha = .91$ ) subscales of the MSLQ (Pintrich et al., 1991). Finally, participants completed the achievement goal scale used in Study 2 (Elliot & McGregor, 2001) assessing performance-approach ( $M = 4.61$ ,  $SD = 1.56$ ,  $\alpha = .89$ ), performance-avoidance ( $M = 4.17$ ,  $SD = 1.45$ ,  $\alpha = .67$ ), mastery-approach ( $M = 5.55$ ,  $SD = 1.07$ ,  $\alpha = .78$ ), and mastery-avoidance ( $M = 3.94$ ,  $SD = 1.33$ ,  $\alpha = .77$ ) goals.

**4.1.3.2. Future time orientation.** FTO was measured with the scale developed by Shell and Husman (2001). This scale contains 25 items that participants rated on a 1 (“Strongly disagree”) to 5 (“Strongly agree”) scale. The FTO connectedness subscale consists of 16 of these items (e.g., “What one does today will have little impact on what happens ten years from now,” reverse scored;  $M = 3.79$ ,  $SD = .44$ ,  $\alpha = .80$ ) and the FTO valence subscale consists of the remaining 9 items (e.g., “Long range goals are more important than short range goals;”  $M = 3.21$ ,  $SD = .53$ ,  $\alpha = .70$ ). Shell and Husman (2001) reported evidence for the inventory’s 2-factor structure and validity for both subscales with regard to certain scholastic criteria.

**4.1.3.3. Graded performance.** Grades were determined based on performance on two non-cumulative midterm examinations (each worth 30% of the final grade), a cumulative final examination (worth 35% of the final grade), and a research participation requirement (worth 5% of the final grade). Graded performance was operationalized as the percentage of total possible points obtained ( $M = 83.23$ ,  $SD = 9.36$ ).

**4.1.3.4. Control variables.** Participants reported their sex, ethnicity, and year in school. Participants also rated their certainty of majoring in psychology using the item from Study 2 ( $M = 3.26$ ,  $SD = 1.62$ )

## 4.2. Results

### 4.2.1. Regression analyses

**4.2.1.1. Overview.** Hypotheses were tested by conducting three hierarchical regression analyses with graded performance as the dependent variable. Because of the small sample size, separate analyses were conducted to test the unique effects of PI controlling for subsets of motivational variables.<sup>3</sup> In the first analysis, we regressed

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<sup>3</sup> Study 3 was primarily designed to test the ability of PI to predict unique variance beyond FTO, and, therefore, did not possess an adequate sample size to examine the effect of PI while controlling for a large number of motivational variables. The effect of PI controlling for all of the remaining motivational variables was comparable to that obtained in Study 2 ( $\beta = .23$ ) but fell slightly short of significance ( $p = .067$ ).

Table 4  
Study 3: regression analyses predicting graded performance

Step	Predictor	$\beta$
<i>Future time orientation</i>		
1	FTO connectedness	.22*
	FTO valence	.02
2	FTO connectedness $\times$ FTO valence	.24*
3	Perceived instrumentality	.24*
<i>Achievement goals</i>		
1	Performance-approach	.18
	Performance-avoidance	-.07
	Mastery-approach	.13
	Mastery-avoidance	-.16
2	Perceived instrumentality	.28*
<i>Self-efficacy and task value</i>		
1	Task value	.10
	Self-efficacy	.19
2	Perceived instrumentality	.22†

Note. For the future time orientation model,  $F(4, 86) = 4.10$ ,  $p < .01$ ,  $R^2 = .16$ ; for the achievement goals model,  $F(5, 85) = 2.60$ ,  $p < .05$ ,  $R^2 = .13$ ; and for the self-efficacy and task value model,  $F(3, 87) = 3.04$ ,  $p < .05$ ,  $R^2 = .10$ .  $N = 91$ .

\*  $p < .05$ .

†  $p < .10$ .

graded performance on the two FTO components at step 1, added the FTO connectedness  $\times$  FTO valence interaction at step 2, and added PI at step 3. In the second analysis, we regressed graded performance on the achievement goals at step 1 and added PI at step 2. In the third analysis, we regressed graded performance on task value and self-efficacy at step 1 and added PI at step 2. Prior to conducting these analyses we tested for sex, ethnicity, year in school, and certainty of major differences in graded performance. No significant differences were found and these variables were, therefore, excluded from the main analyses. The results of these analyses are displayed in Table 4.

*4.2.1.2. Future time orientation.* In the first step, a significant positive main effect was found for FTO connectedness;  $\beta = .22$ ,  $p < .05$ . In the second step, the FTO connectedness  $\times$  FTO valence interaction was significant;  $\beta = .24$ ,  $p < .05$ . Computing separate standardized regression slopes between FTO connectedness and graded performance for hypothetical individuals high (+1 SD) and low (-1 SD) in FTO valence, we found that among participants high in FTO valence (i.e., those who especially value future goals) there was a strong effect of FTO connectedness on performance (.43), but among participants low in FTO valence (i.e., those who are less inclined to value future goals) there was no such effect (-.04). This finding is consis-

tent with expectancy-value (Vroom, 1964) and future time perspective (Nuttin & Lens, 1985) models of motivation. In the third step, a significant positive main effect was found for PI;  $\beta = .24$ ,  $p < .05$ . This confirmed the hypothesis that PI prospectively predicts unique variance in graded performance independently of FTO.

*4.2.1.3. Achievement goals.* At step 1, none of the achievement goal main effects reached significance. At step 2, PI had a significant positive main effect;  $\beta = .28$ ,  $p < .05$ ; replicating the finding that PI accounts for unique variance in graded performance independently of the achievement goals.

*4.2.1.4. Self-efficacy and task value.* At step 1, neither self-efficacy nor task value had a significant main effect. At step 2, PI had a near-significant positive main effect;  $\beta = .22$ ,  $p = .073$ .

### 4.3. Brief discussion

PI was shown to have an effect on graded performance independently of a general tendency to perceive connectedness between current behavior and future outcomes, a general tendency to value future goals, and the combination of these two tendencies. This suggests that the perception that performance in a specific course will help one attain future goals impacts performance beyond the influence of being generally future-oriented. Additionally, the unique effect of PI on performance controlling for the achievement goals was replicated. The effect of PI on performance controlling for self-efficacy and task value only approached significance.

## 5. General discussion

Many constructs have been proposed in the achievement motivation literature (Murphy & Alexander, 2000), some with questionable utility for advancing scientific understanding of achievement motivation processes. From a scientific standpoint, it would be advantageous to limit the classroom achievement motivation constructs studied to those that provide unique insight into the following questions: (1) what motivates students? and (2) how do the sources of students' motivation affect their classroom behavior? The three studies presented here provide evidence that the construct of PI meets these standards. Regarding the "what motivates students?" question, Study 1 showed that a reasonable percentage of students' consciously accessible reasons for doing schoolwork have to do with the perceived instrumentality of school outcomes to future goals that are not directly related to the desires to demonstrate or develop ability. Also, Study 2 provided evidence that PI is empirically distinguishable from established measures of task value, self-efficacy, and the four goals comprising the elaborated  $2 \times 2$  achievement goal model. Thus PI appears to be a subjectively salient and empirically distinct aspect of college students' achievement motivation. Regarding the prediction of classroom behavior, Studies 2 and 3 demonstrated that PI prospectively predicts graded performance in college courses independently of task value, self-efficacy, the

achievement goals, and FTO. Thus PI appears to be a useful construct for addressing how students' motivation maps onto their actual performance.

### *5.1. Achievement goals and non-achievement goals as motivators of classroom behavior*

Achievement goals, as defined in Achievement Goal Theory, are more than just purposes underlying students' achievement behavior, they are purposes that center around a definition of achievement in terms of competence (Pintrich, 2000). However, as some motivation theorists have stated, goals pertaining to conceptions of competence are not the only goals that motivate students to do well in school (Miller et al., 1996; Urdan & Maehr, 1995); after all, college classrooms are not the "ideal achievement-related situations" that Atkinson (1957) manufactured in the laboratory. Rather, students' perceptions of the instrumentality of performance to non-achievement goals (i.e., goals not centering around competence) are often what propel them to enact the behaviors of interest to achievement motivation researchers. PI represents the degree to which individuals feel a sense of connectedness between their outcomes in a particular course and these larger life goals.

Although it has been proposed that larger life goals influence achievement goal adoption (Elliot & Thrash, 2001), empirical research based on Achievement Goal Theory has not examined the achievement goals and PI simultaneously. A singular focus on achievement goals in achievement motivation research has advantages. Most notably, placing rigid boundaries around the goals that are appropriate for study in achievement contexts ensures that a boundless number of goal constructs will not be introduced into the achievement motivation literature. Such a proliferation of goal constructs would make it difficult to synthesize the overwhelming array of very specific findings that would emerge in the literature. We propose, however, that a focus on the general perception of connectedness between course outcomes and life goals is a manageable initial undertaking. Future research on PI might then gradually shift to a focus on potentially useful differentiations within the broad PI construct.

### *5.2. Distinctions within perceived instrumentality*

The omnibus PI construct employed in this research glosses over several theoretically, and perhaps empirically, meaningful distinctions within PI. First, as with the achievement goals, it may be useful to distinguish approach and avoidance PI. Specifically, some individuals may be motivated by the perception that doing well in a course will help them attain something good (e.g., wealth) whereas other students might be motivated by the perception that not doing well in a course will cause them to attain something bad (e.g., poverty). This approach–avoidance distinction is a prominent aspect of both the current achievement motivation literature (Elliot & Covington, 2001) and the broader goals literature (Coats, Janoff-Bulman, & Alpert, 1996; Elliot, Sheldon, & Church, 1997), and might prove useful in the PI literature as well.

Second, a distinction within extrinsic motivation made by Self-Determination theorists is that between integrated and introjected regulation (Deci & Ryan, 1985; Sheldon & Kasser, 1995). To these researchers, extrinsic motivation that has been

internalized varies with regard to whether it is truly accepted and felt as congruent with core psychological needs (i.e., integrated) or taken on without full endorsement and acted upon to avoid guilt and anxiety (i.e., introjected). Individuals may perceive school performance as instrumental to integrated goals, introjected goals, or both. Furthermore, the degree of integration of the goal to which one's achievement is perceived as instrumental is likely to affect the quality of one's experience in the classroom situation (Sheldon & Kasser, 1998). For example, a student who would like to become a doctor because she feels that this is the only way to prove her worth might be affected differently by perceived instrumentality of performance to this goal than a student who would like to become a doctor for reasons that are more aligned with her core psychological needs. Simons and colleagues have addressed a similar distinction between internally and externally regulated PI (Simons et al., 2000). Future research should explore the implications of the quality of internalization of goals to which coursework is perceived as instrumental.

Third, different aspects of a college course might be perceived as instrumental to future goal attainment. On the one hand, one may perceive that performing well grade-wise in a course will make one more likely to attain future goals. Alternatively, one may perceive that learning and mastering the course material will make one more likely to attain future goals. For example, consider two students in a social psychology course who hope to one day become successful lawyers. One of these students is motivated by the perception that getting an A in the course will make her more likely to have a transcript suitable for admission to a top tier law school. The other student is motivated by the perception that mastering the principles taught in the course will make him a more effective lawyer. Both of these students perceive the course as instrumental to the attainment of a valued future goal—but the first student perceives high instrumentality of *graded performance* whereas the second student perceives high instrumentality of *learning*. Husman (1998) and Husman et al. (2004) have proposed a similar distinction between exogenous (i.e., task-unrelated) and endogenous (i.e., task-related) instrumentality. The measure of PI used presently collapses across these two forms of PI. Future research might explore whether these distinct types of PI relate to different outcomes.

### 5.3. Implications and conclusions

In addition to advancing theoretical perspectives on achievement motivation, understanding the role of PI in students' classroom motivation may also have practical educational benefits. Researchers have studied classroom structures designed to influence students' goals, and consequently, educational outcomes (Ames, 1984, 1992; Urdan, 2001). The findings of the present research suggest that in addition to classroom goal structures based on Achievement Goal Theory, those based on nurturing PI may also be worthwhile. Additionally, future research examining the role of PI in the academic challenges faced by socio-economically disadvantaged minorities may yield insight that is useful for developing interventions for members of these groups. Specifically, to the extent that lack of achievement valuing plays a role in these challenges (e.g., Graham & Taylor, 2002), nurturing a belief that achievement

will assist with valued future goal attainment may be especially beneficial for socio-economically disadvantaged minorities.

The present research possesses certain limitations. First of all, the independent effect of PI in Study 3 fell slightly short of significance when certain variables were controlled. Because this effect was nearly significant and was comparable in size to the effect obtained in Study 2, we propose that the lack of statistical significance was due to the small sample size. Nonetheless, future research should reexamine the ability of PI to account for unique variance in performance using larger sample sizes. Other limitations of the present research include lack of variation in the types of college courses sampled, lack of variation in the college from which these courses were sampled, and lack of representation of socio-economically disadvantaged minority students in the samples. In addition to addressing the theoretical issues raised in this discussion section, future research should attempt to replicate the current findings in a variety of courses (e.g., engineering courses and humanities courses) and with more demographically diverse samples.

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