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# Competence Valuation as a Strategic Intrinsic Motivation Process

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*This research investigated the strategic use of competence valuation in achievement settings and examined the consequences of implementing this self-enhancement strategy for intrinsic motivation. In two studies, participants reported higher competence valuation following positive feedback; in turn, competence valuation was positively related to intrinsic motivation. Competence valuation mediated the direct relationship between feedback and intrinsic motivation, and this mediation was independent of perceived competence, which also served a mediational function. Study 2 identified the specific nature of the observed effects. Participants receiving positive feedback reported higher competence valuation (and perceived competence), which led to enhanced intrinsic motivation; the reciprocal processes were not operative for those receiving negative feedback.*

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**I**ntrinsic motivation may be defined as interest in or enjoyment of an activity for its own sake (Lepper, 1981; Ryan, 1992). Over the past 30 years, a substantial body of research on intrinsic motivation has emerged, most of which documents various contextual variables (e.g., rewards, deadlines, evaluation) that increase or decrease intrinsic motivation and the mediational processes through which these effects occur. From the beginning, intrinsic motivation theorists have placed competence at the conceptual center of the construct (Deci, 1975; Harter, 1978; White, 1959; see Deci & Ryan, 1985, for a discussion of additional important aspects of intrinsic motivation), and over the years, two competence-relevant processes have emerged as important mediators of

intrinsic motivation effects—perceived competence and competence valuation.

Perceived competence represents the extent to which a person believes that he or she has performed or is able to perform well at an activity (Bandura, 1982; Harter, 1981). Perceived competence is presumed to affect intrinsic motivation following feedback, either during or at the conclusion of performance on a task (Bandura, 1982; Harackiewicz, 1989). Thus, performance feedback is hypothesized to influence perceptions of competence, which in turn influence intrinsic motivation.<sup>1</sup> Several studies have shown that perceived competence is an important process variable in intrinsic motivation research (Bandura & Schunk, 1981; Elliot & Harackiewicz, 1994; Harackiewicz & Elliot, 1993, 1998; Harackiewicz & Larsen, 1986; Harackiewicz, Manderlink, & Sansone, 1984; Harackiewicz, Sansone, & Manderlink, 1985; Manderlink & Harackiewicz, 1984; Reeve & Deci, 1996; Sansone, 1986, 1989; Sansone, Sachau, & Weir, 1989). Competence valuation represents the degree to which a person cares about doing well at an activity (Harackiewicz & Manderlink, 1984). Competence valuation is presumed to be operative prior to and during performance of the task (Harackiewicz, 1989). Thus, an aspect of the

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performance context (e.g., the offer of a reward) is hypothesized to influence how important it is to do well at the beginning of the task (directly or in interaction with an individual difference variable such as achievement orientation), which in turn influences intrinsic motivation (alone or in interaction with a contextual or individual difference variable). Numerous studies have demonstrated that competence valuation is an important process variable in intrinsic motivation research (Elliot & Harackiewicz, 1994; Epstein & Harackiewicz, 1992; Harackiewicz, Abrahams, & Wageman, 1987; Harackiewicz & Elliot, 1993, 1998; Harackiewicz & Manderlink, 1984; Harackiewicz et al., 1984, 1985; Reeve & Deci, 1996; Sansone, 1986, 1989). Perceived competence and competence valuation are commonly construed as independent mediators of intrinsic motivation effects (Harackiewicz & Sansone, 1991); the knowledge that one is competent and the desire to be competent are viewed as separate paths through which intrinsic interest and enjoyment are sustained and enhanced.

Although most research has examined the effects of contextual (and individual difference) variables on competence valuation prior to performance of a task, Sansone (1986, 1989) has suggested that competence valuation also may be influenced by feedback after performance. This raises the intriguing possibility that competence valuation may, in some instances, represent a person's strategic self-investment or divestment from the pursuit of competence. That is, to bolster or protect his or her self-esteem, a person may declare that performing well at a task is highly important immediately following successful performance on that task or a person may insist that performing well at the task is not at all important immediately following a poor performance. This strategic valuing or devaluing of competence is likely to have direct implications for intrinsic motivation: Increasing one's investment in competent performance should enhance intrinsic motivation, whereas decreasing it would undoubtedly decrease intrinsic motivation. In referring to the motivated valuing or devaluing of competence following feedback as strategic, we do not intend to imply that it is a conscious process. Motivated biases can operate with or without conscious awareness (Showers & Cantor, 1985), and we presume that this particular strategy is largely a nonconscious process (or at least operates most effectively at the nonconscious level). The present research investigates this strategic aspect of competence valuation and examines whether this process operates independently of the other primary competence-relevant process—perceived competence. In the following paragraphs, we will establish the conceptual foundation for this expanded view of competence valuation and describe the specific hypotheses tested in the present research.

It is essentially axiomatic in the social and personality psychology literatures that self-evaluation is a motivated process (Banaji & Prentice, 1994; Sedikides, 1993). Several different motives for self-evaluation have been posited, one of the most prominent being self-enhancement—the desire to elevate the positivity of the self-concept and protect the self-concept from negative information (Banaji & Prentice, 1994; Sedikides & Strube, 1997). Most self-theorists view self-enhancement as a (if not the) basic motive guiding self-evaluation, and a large body of research has accumulated over the past two decades to support this proposition. This literature has demonstrated that self-enhancement can be accomplished through a diverse assortment of strategies (for reviews, see Banaji & Prentice, 1994; Brown & Dutton, 1995; Dunning, 1993; Kunda, 1990; Sedikides & Strube, 1997; Taylor & Brown, 1988).

One interesting strategy, and the one most directly relevant to the present work, involves the selective (i.e., motivated) valuing and devaluing of self-relevant attributes. Several variants of this strategy have been delineated. Festinger (1957), for instance, posited that an individual experiencing cognitive dissonance (i.e., psychological discomfort generated by a discrepancy between two cognitive elements) may decrease the importance of the elements involved in the dissonant relations as a mode of dissonance reduction. Rosenberg (1967; see also Steele, 1992; Wells & Marwell, 1976) argued that individuals are motivated to value the qualities that they think they possess and devalue those they believe they lack. In his self-evaluation maintenance model, Tesser (1988) hypothesized that being outperformed by another person (especially a close other) on a particular activity leads individuals to reduce the relevance of performance at the activity to their self-definition. Each of these propositions has received empirical support, although research in this area has actually been somewhat sparse relative to that on many other self-enhancement strategies (Festinger's proposition: Aronson, Blanton, & Cooper, 1995; Simon, Greenberg, & Brehm, 1995; Rosenberg's proposition: Frey & Stahlberg, 1987; Hill, Smith, & Lewicki, 1989; Kling, Ryff, & Essex, 1997; Lewicki, 1984; Osborne, 1997; Rosenberg, 1982; Tesser's proposition: Tesser & Campbell, 1980; Tesser & Paulus, 1983).

One limitation of the extant research on this "selective importance" (Brown, 1991) strategy is its predominant focus on responses to negative information (Kling et al., 1997). Individuals may implement this strategy in response to positive information, negative information, or both; thus, it is important for researchers to examine both valences and to identify the specific nature of the effects observed. Another limitation is that researchers have focused little attention on the consequences of

implementing a selective importance strategy. Although the consequences of using self-enhancement strategies have recently begun to receive attention (Kling et al., 1997; Taylor & Armor, 1996), no research to date has examined this strategy as a mediational mechanism.

In achievement settings, competence is the self-attribute that is evaluated because individuals are commonly provided with positive or negative competence information (feedback) following performance of a task. Implementing the selective importance strategy in this context would entail the valuing or devaluing of competence at the activity as a function of success or failure: Individuals performing well would place a high value on competent performance and/or those performing poorly would minimize the importance of competent performance. In the present research, we examined this strategic use of competence valuation in two studies. Study 1 was an experimental study in which positive and negative feedback on a novel hidden-figures task was manipulated and participants (Ps) were subsequently provided with an opportunity to bolster or minimize the value of performing well at the task. Study 2 was a field study in which students in the college classroom were given veridical feedback on their course examinations and then provided with an opportunity to bolster or minimize the value of performing well in the class. In both studies, we hypothesized that Ps would implement the selective importance strategy by reporting high levels of competence valuation following good performance and/or low levels of competence valuation following poor performance. In Study 2, we also sought to identify the specific direction of the effect by comparing a good performance group to an average performance group and an average performance group to a poor performance group. We made no a priori predictions regarding the direction of the effect.

In addition to investigating the strategic use of competence valuation in achievement settings, we also examined the consequences of implementing this self-enhancement strategy. Reducing competence valuation following failure may have some temporary self-esteem benefits but it is also likely to have negative ramifications. For example, in their discussion of African American underachievement, Steele and Aronson (1995) argued that “protective dis-identification” from the intellectual domain following academic failure is likely to have “the byproduct of diminishing interest, motivation, and, ultimately, achievement” (p. 797). On the positive side, if initial success leads to increased identification and competence valuation, it seems likely that positive motivational and achievement outcomes would accrue.

In the present research, we examined the relationship between the strategic use of competence valuation

and intrinsic motivation. Both competence valuation and intrinsic motivation represent an investment in performing a task—competence valuation is viewed as a commitment to performing the task well (Epstein & Harackiewicz, 1992; Harackiewicz & Elliot, 1998) and intrinsically motivated behavior is typically accompanied by a sense of total absorption and immersion in the task (Csikszentmihalyi & Nakamura, 1989; Privette, 1983; Waterman, 1990). It is likely that a commitment to competent performance on a task would foster an absorption and immersion in the task; thus, we posit that competence valuation will promote intrinsic motivation (for empirical precedents with competence valuation assessed at the beginning of the task, see Elliot & Harackiewicz, 1994; Epstein & Harackiewicz, 1992; Harackiewicz & Manderlink, 1984; Reeve & Deci, 1996).

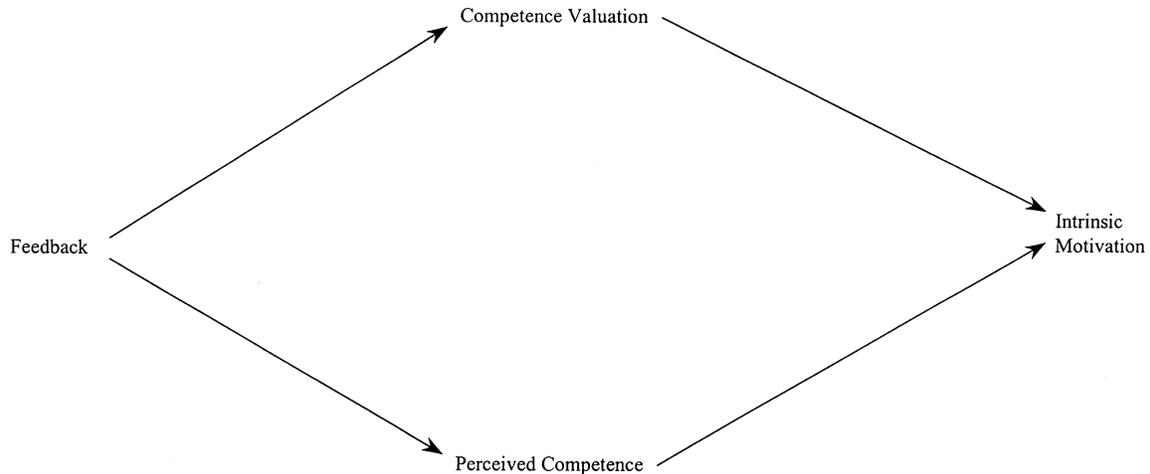
Putting the two components of our hypotheses together yields the following model: positive/negative feedback → competence valuation → intrinsic motivation. From this model, it can be seen that we view (the strategic use of) competence valuation as a mediator of the direct relationship between positive/negative feedback and intrinsic motivation. Several researchers have found empirical support for the direct effect of feedback on intrinsic motivation (McAuley & Tammen, 1989; Reeve & Deci, 1996; Sansone et al., 1989; Vallerand & Reid, 1984; Weinberg & Ragan, 1979; cf. Anderson & Rodin, 1989; Baumeister & Tice, 1985); however, the mediational role of competence valuation has yet to be demonstrated.<sup>2</sup> Nevertheless, the other competence-relevant process, perceived competence, has been shown to mediate the relationship between positive/negative feedback and intrinsic motivation. Positive, relative to negative, feedback has been linked to perceived competence, which in turn is a positive predictor of intrinsic motivation (Reeve & Deci, 1996; Vallerand & Reid, 1984, 1988). As such, it is important to take perceived competence into account when investigating the mediational role of competence valuation, and in the present studies, we examined competence valuation and perceived competence as joint, independent mediators of the relationship between feedback and intrinsic motivation. A diagram of the mediational model to be tested in the present research is provided in Figure 1.

## STUDY 1

### *Method*

#### *PARTICIPANTS AND DESIGN*

The study consisted of 51 female and 46 male university undergraduates who participated in the experiment in return for extra course credit. Ps were randomly assigned to one of four experimental conditions in a 2



**Figure 1** The hypothesized model: Competence valuation and perceived competence as joint mediators of the relationship between positive/negative feedback and intrinsic motivation.

(feedback: good performance vs. poor performance)  $\times$  2 (order: perceived competence first vs. competence valuation first) between-Ps factorial design.<sup>3</sup>

#### PROCEDURE AND MANIPULATIONS

After arriving at the experimental laboratory, Ps were introduced to the target activity—Nina puzzles. Nina puzzles are a hidden word game, the object of which is to find and circle the word *Nina*, which is interspersed a number of times throughout a series of drawings. After completing a sample Nina puzzle, Ps reported their level of enjoyment of the activity, thereby providing a prefeedback measure of intrinsic motivation. Ps were then informed that they would be given 90 seconds to solve each of three Nina puzzles and that they would be provided with performance feedback once they had finished all of the puzzles. Ps then proceeded to solve the three Nina puzzles. To minimize participant-experimenter interaction, tape-recorded instructions guided Ps through the puzzle-solving period. After completing the puzzles, Ps were given a filler task while the experimenter ostensibly scored their puzzles. All Ps were then provided with a three-page booklet, the first page of which was an information form containing the following:

In today's session you found \_\_\_\_% of all the Ninas hidden in the puzzles. Over the past two semesters, we have collected data from more than 400 (university) students. The number of Ninas that you found in today's session represents

\_\_\_\_ good puzzle solving compared to other (university) students.

\_\_\_\_ average puzzle solving compared to other (university) students.

\_\_\_\_ poor puzzle solving compared to other (university) students.

Ps in the good performance condition were informed that they found 81% of the hidden Ninas and a check mark was placed next to the good puzzle-solving phrase; Ps in the poor performance condition were told that they found 41% of the hidden Ninas and a check mark was placed next to the poor puzzle-solving phrase. These percentage values were selected on the basis of a pilot test that was conducted to determine specific feedback values that would be both clearly valenced yet within the range of believability.

After reading the information form, Ps were instructed to turn the page of the booklet and complete the next two pages. Page 2 contained the perceived competence and competence valuation questions. The order of these questions was counterbalanced: In the perceived competence first condition, Ps encountered the perceived competence question prior to the competence valuation questions; in the competence valuation first condition, Ps encountered a competence valuation question prior to the perceived competence question. When they had completed the competence valuation and perceived competence questions, Ps turned to the last page of the booklet and reported their enjoyment of the Nina puzzle activity (thereby providing a postfeedback measure of intrinsic motivation). Then Ps were queried as to whether they had heard anything about the experiment before participating (and if so, what they had heard) and whether they had solved Nina puzzles prior to the experimental session. Finally, Ps were informed about the deception involved in the performance feedback, given their extra credit slip, and dismissed.<sup>4</sup>

## MEASURES AND MATERIALS

*Nina puzzles.* Nina puzzles have been used in previous intrinsic motivation research (Harackiewicz, 1979; Ryan, 1982); pilot testing by Harackiewicz and Elliot (1993) has demonstrated that university undergraduates desire to perform competently at the activity and find it enjoyable. The Nina puzzles selected for use in this experiment were those that were found to produce minimal performance variability in previous pilot testing with a large set of Nina puzzles (Elliot & Harackiewicz, 1996).

*Process measures.* A single item was used to assess perceived competence: "How do you think you did on the three Nina puzzles today?" Ps responded to this question on a 1 (*very poorly*) to 7 (*very well*) scale. Two items were used to assess competence valuation: "It was important to me to do well on the Nina puzzles in today's session" and "I cared very much how I did on the Nina puzzles." Ps' responses on the 1 (*strongly disagree*) to 7 (*strongly agree*) scales were summed to form a competence valuation index (Cronbach's  $\alpha = .82$ ).

*Intrinsic motivation.* Two types of indicators of intrinsic motivation have been widely used in the literature: self-report measures of enjoyment and behavioral measures of persistence. These two types of measures are commonly positively correlated (around .4 in magnitude) in contexts in which confirming feedback is provided (Harackiewicz, 1979; Harackiewicz et al., 1984). However, these measures are often uncorrelated in contexts where nonconfirming or negative feedback is provided (Ryan, Koestner, & Deci, 1991), and the use of self-report rather than behavioral persistence measures is clearly preferable in these instances. Given the use of negative feedback in the present research, a self-report measure of task enjoyment was used as our indicator of intrinsic motivation.

A single self-report item was used to assess prefeedback task enjoyment ("At this time, how enjoyable do you think this Nina puzzle activity is?"). Ps responded to this question on a 1 (*not enjoyable at all*) to 7 (*very enjoyable*) scale. Elliot and Harackiewicz' (1996) three-item self-report measure of task enjoyment was used to assess intrinsic motivation following the receipt of performance feedback ("I enjoy doing Nina puzzles very much," "I think that doing Nina puzzles is boring" [reversed], and "Nina puzzles are fun"). Ps' ratings on the 1 (*strongly disagree*) to 7 (*strongly agree*) scales were summed to form the postfeedback index of task enjoyment (Cronbach's  $\alpha = .91$ ). A substantial amount of empirical work attests to the reliability of such measures and to their validity as indicators of intrinsic motivation (see Harackiewicz, 1979; Rawsthorne & Elliot, 1999; Ryan, Mims, & Koestner, 1983; Sansone, 1986).

## Results

## OVERVIEW

A series of hierarchical multiple regression analyses were conducted to investigate the effect of the independent variables (feedback, order, and Feedback  $\times$  Order) on the dependent variable (postfeedback task enjoyment) and to test the process variables (perceived competence and competence valuation) as joint mediators of the direct effect. Following the guidelines of Judd and Kenny (1981), the dependent variable was first regressed on the independent variables to test for a direct effect. Once a direct effect had been documented, the process variables were regressed on the independent variables to examine the first link in the proposed mediational sequence. Finally, the link between the process variables and the dependent variable was tested by regressing the dependent variable on the process variables with the independent variables controlled.

A set of orthogonal contrasts were used to test the hypotheses: the feedback contrast compared the good performance group (+1) to the poor performance group (-1), the order contrast compared the perceived competence first order (+1) to the competence valuation first order (-1), and the Feedback  $\times$  Order product term represented the interaction between the two variables. Gender (women = +1, men = -1) was included in all analyses and prefeedback task enjoyment was included in all analyses using postfeedback task enjoyment as the dependent variable. Gender was not a variable of central theoretical interest in the present research but was included in the analyses as a control variable; those interested in additional details regarding the gender variable are encouraged to contact the senior author. Preliminary analyses examining all possible interactions involving the primary variables (feedback and order) and the covariates (gender and prefeedback task enjoyment) failed to yield any significant higher-order effects; therefore, these interactions were not included in the analyses. Feedback, order, Feedback  $\times$  Order, gender, and (in analyses with postfeedback task enjoyment) prefeedback task enjoyment comprised the basic model used in the following analyses. Descriptive statistics and zero-order correlations for the study variables are provided in Table 1.

## THE DIRECT EFFECT OF THE INDEPENDENT VARIABLES ON THE DEPENDENT VARIABLE

Regressing postfeedback task enjoyment on the basic model revealed a marginally significant effect for gender,  $F(1, 92) = 2.93, p = .09$  ( $\beta = .12$ ) and a significant effect for prefeedback task enjoyment,  $F(1, 92) = 76.95, p < .0001$  ( $\beta = .64$ ), indicating that women and those with higher initial enjoyment of the puzzles reported greater intrinsic motivation. More important, the analysis also

**TABLE 1: Study 1: Descriptive Statistics and Intercorrelations Among the Variables**

Variable	Variable									
	M	SD	1	2	3	4	5	6	7	
1. Feedback	—	—	—	—	—	—	—	—	—	—
2. Order	—	—	-.03	—	—	—	—	—	—	—
3. Perceived competence	4.16	1.51	.54**	-.08	—	—	—	—	—	—
4. Competence valuation	4.12	1.60	.26*	-.16	-.05	—	—	—	—	—
5. Prefeedback task enjoyment	4.75	1.13	.10	.11	.11	.12	—	—	—	—
6. Postfeedback task enjoyment	4.95	1.25	.30**	.12	.31**	.21**	.67**	—	—	—
7. Gender	—	—	-.05	.03	-.26**	-.11	-.04	.09	—	—

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

**TABLE 2 Primary Results for Studies 1 and 2**

	Feedback to Postfeedback Enjoyment	Feedback to Perceived Competence/ Competence Evaluation	Perceived Competence/ Competence Valuation to Postfeedback Enjoyment	Feedback to Postfeedback Enjoyment With Mediators Controlled
Study 1	.24**	.53**/.25*	.28**/.17*	.06
Study 2	.30**	.81**/.19*	.32**/.18*	.00

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

revealed a significant effect of feedback,  $F(1, 92) = 11.20, p < .005$  ( $\beta = .24$ ), indicating that Ps who received positive feedback reported greater task enjoyment than did those who received negative feedback.

*THE EFFECT OF THE INDEPENDENT VARIABLES ON THE PROCESS VARIABLES*

*Perceived competence.* The regression of perceived competence on the basic model yielded significant effects for gender,  $F(1, 93) = 7.86, p < .01$  ( $\beta = -.23$ ) and feedback,  $F(1, 93) = 40.13, p < .0001$  ( $\beta = .53$ ). Men reported higher perceptions of competence, as did those who received positive performance feedback.

*Competence valuation.* Regressing competence valuation on the basic model yielded a significant effect for feedback,  $F(1, 93) = 6.20, p < .05$  ( $\beta = .25$ ), indicating that Ps receiving positive feedback reported a higher level of competence valuation than did those receiving negative feedback.

*MEDIATION ANALYSIS: THE EFFECT OF THE PROCESS VARIABLES ON THE DEPENDENT VARIABLE WITH THE INDEPENDENT VARIABLES CONTROLLED*

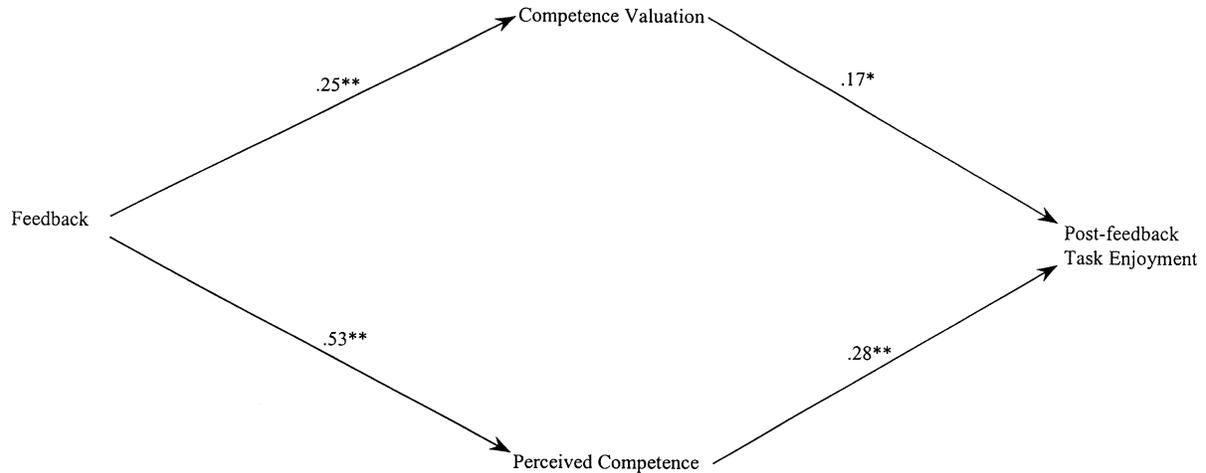
Mediation was tested by regressing postfeedback task enjoyment on the basic model with perceived competence and competence valuation also in the equation. This analysis yielded a significant effect for gender,  $F(1, 90) = 7.87, p < .01$  ( $\beta = .20$ ) and prefeedback task enjoyment,  $F(1, 90) = 74.72, p < .0001$  ( $\beta = .61$ ), indicating that women and those reporting higher initial enjoyment of the puzzles reported greater intrinsic motivation. More

important, the analysis also revealed an effect for both perceived competence,  $F(1, 90) = 9.85, p < .005$  ( $\beta = .28$ ) and competence valuation,  $F(1, 90) = 5.19, p < .05$  ( $\beta = .17$ ). Ps with higher perceptions of competence and those reporting higher levels of competence valuation indicated greater enjoyment of the Nina puzzles. Furthermore, the direct relationship between feedback and postfeedback task enjoyment was no longer significant with perceived competence and competence valuation in the equation, and the beta coefficient for this relationship dropped from .24 to .06. These results clearly establish perceived competence and competence valuation as joint mediators of the direct relationship between feedback and postfeedback task enjoyment. These results are summarized in Table 2, and a pictorial summary of the final mediational model is presented in Figure 2.<sup>5</sup>

Parenthetically, we also tested an interactional mediational model in which perceived competence and competence valuation combine multiplicatively to predict postfeedback task enjoyment. This analysis yielded a null result for the interaction.

*Discussion*

The results of this study provide strong support for our hypotheses. Ps used competence valuation in a strategic manner, reporting higher competence valuation following positive performance feedback relative to negative performance feedback. Competence valuation, in turn, was a positive predictor of task enjoyment. Positive feedback also led to higher perceptions of competence at the activity, and perceived competence was a positive



**Figure 2** The final mediational model.

NOTE: Path values are standardized regression coefficients; only the theoretically central variables are included for presentation clarity.

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

predictor of task enjoyment. Mediation analyses revealed that competence valuation and perceived competence were joint, independent mediators of the direct effect of positive/negative feedback on task enjoyment. That is, positive/negative feedback had its effect on task enjoyment by influencing both the competence valuation and perceived competence processes, which in turn had independent influences on task enjoyment; when the mediational role of competence valuation and perceived competence were accounted for, the direct effect of positive/negative feedback on task enjoyment was eliminated.

Study 2 represents an attempt to conceptually replicate and extend the results of Study 1. In Study 1, performance variability was intentionally minimized and positive/negative feedback was manipulated on a novel task—hidden-figures puzzles. In contrast, in Study 2, performance attainment was left free to vary and veridical positive/negative feedback was provided on a real-world achievement task—course examinations. If the same pattern of results obtained in Study 1 could be obtained in Study 2, it would nicely attest to the reliability of the findings and demonstrate their generalizability to an important and ecologically valid achievement setting.

In Study 2 we also sought to pinpoint the precise nature of the effects documented in Study 1. The contrast of positive performance feedback with negative performance feedback in Study 1 was informative with regard to the presence of effects on competence valuation and intrinsic motivation but it shed no light on the specific direction of the effects—those receiving positive feedback could be increasing their competence valuation/intrinsic motivation, those receiving negative feed-

back could be decreasing their competence valuation/intrinsic motivation, or both could be occurring. The use of a continuous performance feedback variable in Study 2 afforded a more detailed analysis of these effects. Specifically, it enabled us to trichotomize the performance feedback variable and to conduct ancillary a priori contrasts comparing the good performance group to the average performance group and the average performance group to the poor performance group.

## STUDY 2

### Method

#### PARTICIPANTS AND CONTEXT

The study consisted of 106 female and 64 male university undergraduates who participated in the experiment in return for extra course credit. The class was conducted in lecture format; students were informed at the beginning of the course that evaluation would be based on a normative grading structure.

#### PROCEDURE

At the beginning of the semester, Ps reported how much they thought they would enjoy the class, thereby providing a prefeedback measure of intrinsic motivation. One week after each of two exams, Ps were provided with performance feedback. Ps were informed of their raw score on the exam and given a grade distribution that linked their raw score to a specific letter grade. Near the end of the semester, Ps were provided with a questionnaire on which they first indicated their perceptions regarding how well they were doing in the class; then, on a separate page, they indicated how important it was for them to do well; and finally, on the last page,

**TABLE 3: Study 2: Descriptive Statistics and Intercorrelations Among the Variables**

Variable	M	SD	Variable							
			1	2	3	4	5	6	7	
1. Feedback	64.00	16.68	—							
2. Perceived competence	4.05	1.82	.79**	—						
3. Competence valuation	5.93	1.03	.13†	.17*	—					
4. Prefeedback class enjoyment	5.62	1.01	.00	.08	.22**	—				
5. Postfeedback class enjoyment	5.03	1.45	.26**	.39**	.27**	.24**	—			
6. Gender	—	—	-.05	-.10	.22**	.19*	.00	—		
7. SAT score	1191.81	151.87	.40**	.27**	-.08	-.04	-.06	-.17*	—	

NOTE: SAT = Scholastic Aptitude Test.  
 † $p < .10$ . \* $p < .05$ . \*\* $p < .01$ .

they reported their enjoyment of the class (thereby providing a postfeedback measure of intrinsic motivation). At the end of the semester, Ps completed a consent form allowing the investigator access to their Scholastic Aptitude Test (SAT) information from the university registrar, thereby enabling analyses to be conducted controlling for this (relatively) objective indicator of ability.<sup>6</sup>

*MEASURES AND MATERIALS*

*The exams and the feedback variable.* The exams in the class were noncumulative and were composed of both multiple choice and short-answer/essay questions. Ps' scores on the two exams were summed to form the feedback (continuous) variable (Cronbach's  $\alpha = .86$ ).

*Process measures.* As in Study 1, a single item was used to assess perceived competence: "I think I have done very well in this class." Ps responded to this question on a 1 (*strongly disagree*) to 7 (*strongly agree*) scale. Two items were used to assess competence valuation: "It is important to me to do well in this class" and "I care very much how well I do in this class." Ps' responses on the 1 (*strongly disagree*) to 7 (*strongly agree*) scales were summed to form a competence valuation index (Cronbach's  $\alpha = .88$ ).

*Intrinsic motivation.* As in Study 1, a single self-report item was used to assess prefeedback class enjoyment ("I think I will enjoy this class very much"). Ps responded to this question on a 1 (*not at all true of me*) to 7 (*very true of me*) scale. Elliot and Church's (1997) eight-item self-report measure of class enjoyment was used to assess intrinsic motivation following the receipt of performance feedback (sample items: "I enjoy this class very much," "I think this class is boring" [reversed]). Ps' ratings on the 1 (*strongly disagree*) to 7 (*strongly agree*) scales were summed to form the postfeedback index of class enjoyment (Cronbach's  $\alpha = .96$ ).

*SAT scores.* An SAT score index was created by summing Ps' scores on the verbal and math components of the SAT.

*Results*

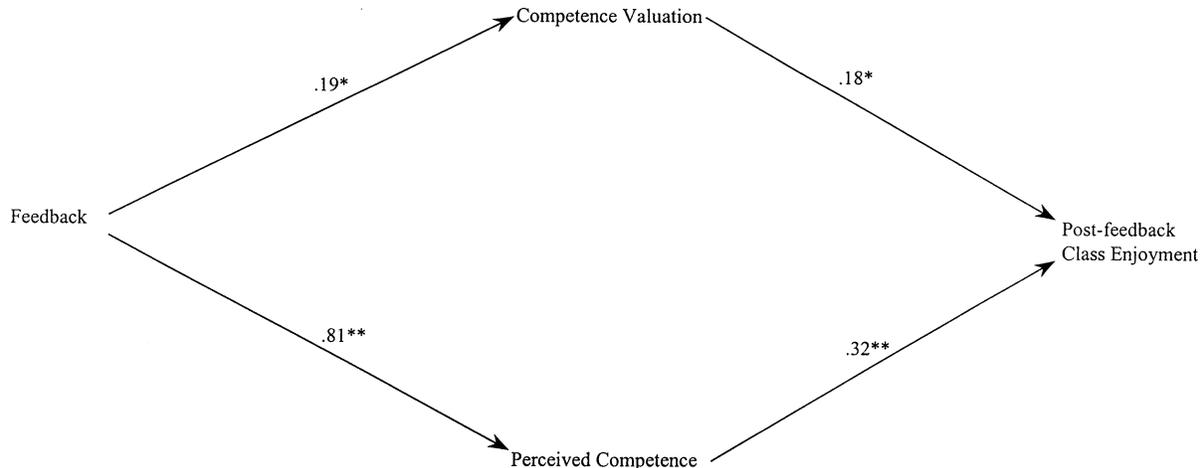
*OVERVIEW*

The same basic data-analytic procedures used in Study 1 also were employed to analyze the Study 2 data. A series of multiple regression analyses were conducted to investigate the effect of the independent variable (feedback) on the dependent variable (postfeedback class enjoyment) and to test the process variables (perceived competence and competence valuation) as joint mediators of the direct effect. Ancillary analyses were conducted to determine the specific direction of the observed effects.

Feedback, SAT scores, gender (women = +1, men = -1), and (in analyses with postfeedback class enjoyment as the dependent variable) prefeedback class enjoyment comprised the basic model in the analyses. Preliminary analyses examining all possible interactions involving feedback yielded a single significant higher-order effect. The Feedback  $\times$  Gender  $\times$  Prefeedback class enjoyment interaction in the postfeedback class enjoyment analyses attained significance; this interaction was controlled for in the final analyses (those interested in the specific nature of the effect are encouraged to contact the senior author). Descriptive statistics and zero-order correlations for the study variables are provided in Table 3.

*THE DIRECT RELATIONSHIP BETWEEN THE INDEPENDENT VARIABLES AND THE DEPENDENT VARIABLE*

The regression of postfeedback class enjoyment on the basic model yielded a significant effect for SAT scores,  $F(1, 161) = 6.93, p < .01$  ( $\beta = -.20$ ) and prefeedback class enjoyment,  $F(1, 161) = 17.79, p < .0001$  ( $\beta = .32$ ), indicating that Ps with low SAT scores and those with higher initial enjoyment of the class reported greater intrinsic motivation. More important, the analysis also revealed an effect of feedback,  $F(1, 161) = 14.69, p < .0005$  ( $\beta = .30$ ), indicating that Ps performing well in



**Figure 3** The final mediational model.

NOTE: Path values are standardized regression coefficients and only the theoretically central variables are included for presentation clarity. \* $p < .05$ . \*\* $p < .01$ .

the class reported greater enjoyment of the class than did those performing poorly.

*THE RELATIONSHIP BETWEEN THE INDEPENDENT VARIABLES AND THE PROCESS VARIABLES*

*Perceived competence.* Regressing perceived competence on the basic model yielded a significant effect for feedback,  $F(1, 166) = 245.55, p < .0001$  ( $\beta = .81$ ). Ps performing well in the class reported higher perceptions of competence than did those performing poorly.

*Competence valuation.* The regression of competence valuation on the basic model yielded a significant effect for gender,  $F(1, 166) = 7.80, p < .01$  ( $\beta = .21$ ) and feedback,  $F(1, 166) = 5.51, p < .05$  ( $\beta = .19$ ). Women reported a higher level of competence valuation than did men, and Ps performing well in the class reported a higher level of competence valuation than did those performing poorly.

*MEDIATION ANALYSIS: THE RELATIONSHIP BETWEEN THE PROCESS VARIABLES AND THE DEPENDENT VARIABLE WITH THE INDEPENDENT VARIABLES CONTROLLED*

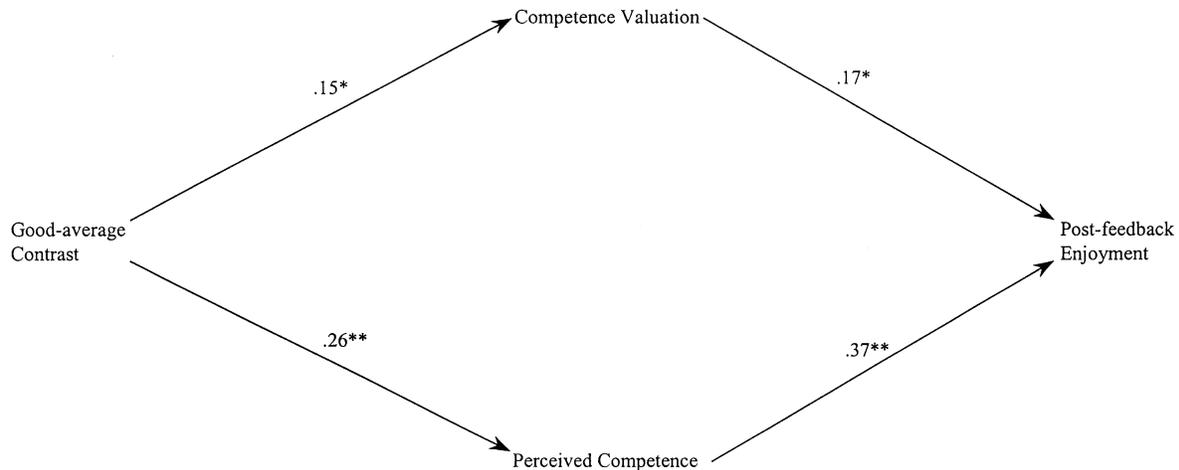
Mediation was tested by regressing postfeedback class enjoyment on the basic model with perceived competence and competence valuation also in the equation. This analysis yielded a significant effect for SAT scores,  $F(1, 159) = 4.41, p < .05$  ( $\beta = -.16$ ) and prefeedback class enjoyment,  $F(1, 159) = 11.90, p < .001$  ( $\beta = .26$ ), indicating that Ps with low SAT scores and those with higher initial enjoyment of the class reported greater intrinsic motivation. More important, the analysis also yielded an effect for both perceived competence,  $F(1, 159) = 8.55, p < .005$  ( $\beta = .32$ ) and competence valuation,  $F(1, 159) =$

6.48,  $p < .05$  ( $\beta = .18$ ). Ps with higher perceptions of competence and those reporting higher levels of competence valuation indicated greater enjoyment of the class. Furthermore, the direct relationship between feedback and postfeedback class enjoyment was no longer significant with perceived competence and competence valuation in the equation, and the beta coefficient for this relationship dropped from .30 to .00. These results clearly establish perceived competence and competence valuation as joint mediators of the direct relationship between feedback and postfeedback class enjoyment. These results are summarized in Table 3 and a pictorial summary of the final mediational model is presented in Figure 3.

Parenthetically, we also tested an interactional mediational model in which perceived competence and competence valuation combine multiplicatively to predict class enjoyment. This analysis yielded a null result for the interaction.

*ANCILLARY ANALYSES*

Ancillary analyses were conducted to determine the precise nature of the observed relationships. In these analyses, the feedback (continuous) variable was split into three groups representing different levels of performance: good performance (1 *SD* above the mean, +1), average performance (within 1 *SD* of the mean, 0), and poor performance (1 *SD* below the mean, -1). An initial set of analyses was performed to determine whether this trichotomous feedback variable would yield the same results that were obtained with the continuous feedback variable. This was indeed the case—all of the significant effects reported above from the continuous variable analyses also were significant using the trichotomous



**Figure 4** The mediational model for the good-average contrast.

NOTE: Path values are standardized regression coefficients and only the theoretically central variables are included for presentation clarity. \* $p < .05$ . \*\* $p < .01$ .

variable in its place. Two a priori contrasts were then created: the good-average contrast compared the good performance group (+1) to the average performance group (-1; the poor performance group was represented by 0) and the average-poor contrast compared the average performance group (+1) to the poor performance group (-1; the good performance group was represented by 0). These contrasts are not orthogonal to the overall contrast but represent protected planned comparisons, which are conceptually analogous to Fisher's least significant difference tests (see Elliot & Harackiewicz, 1996). Two sets of analyses were conducted, both of which repeated the sequence of primary analyses using one of the a priori contrasts in place of the overall feedback variable.

*Analyses with the good-average contrast.*<sup>7</sup> The postfeedback class enjoyment analysis yielded a significant effect for prefeedback class enjoyment,  $F(1, 165) = 10.80, p < .005$  ( $\beta = .25$ ), indicating that Ps with higher initial enjoyment reported greater intrinsic motivation. More important, the analysis also revealed an effect for the good-average contrast,  $F(1, 165) = 3.87, p = .05$  ( $\beta = .15$ ), indicating that Ps in the good performance group reported greater class enjoyment than did those in the average-performance group.

The perceived competence regression yielded significant effects for both SAT scores,  $F(1, 165) = 8.24, p < .005$  ( $\beta = .21$ ) and the good-average contrast,  $F(1, 165) = 9.08, p < .005$  ( $\beta = .22$ ). Ps with higher SAT scores and those who performed better had higher perceptions of competence. The competence valuation regression yielded effects for both gender,  $F(1, 166) = 8.27, p < .005$  ( $\beta = .22$ ) and the good-average contrast,  $F(1, 166) = 3.79, p = .05$  ( $\beta =$

.15). Women and those who performed better reported higher levels of competence valuation.

The mediational analysis yielded a significant effect for SAT scores,  $F(1, 163) = 4.38, p < .05$  ( $\beta = -.15$ ) and prefeedback class enjoyment,  $F(1, 163) = 6.35, p < .05$  ( $\beta = .18$ ), indicating that Ps with low SAT scores and those with higher initial enjoyment of the class reported greater intrinsic motivation. More important, the analysis also yielded an effect for both perceived competence,  $F(1, 163) = 24.38, p < .0001$  ( $\beta = .37$ ) and competence valuation,  $F(1, 163) = 5.09, p < .05$  ( $\beta = .17$ ). Ps with higher perceptions of competence and those reporting higher levels of competence valuation indicated greater enjoyment of the class. Furthermore, the direct relationship between the good-average contrast and postfeedback class enjoyment was no longer significant with perceived competence and competence valuation in the equation, and the beta coefficient for this relationship dropped from .15 to .02. These mediational results clearly establish perceived competence and competence valuation as joint mediators of the direct relationship between the good-average contrast and postfeedback class enjoyment. A pictorial summary of these results is presented in Figure 4.

*Analyses with the average-poor contrast.* The average-poor contrast attained significance in only one analysis. The perceived competence regression yielded a significant effect for the average-poor contrast,  $F(1, 166) = 7.20, p < .01$  ( $\beta = .20$ ) as well as SAT scores,  $F(1, 166) = 7.44, p < .01$  ( $\beta = .21$ ). Ps who performed average and those with higher SAT scores had higher perceptions of competence. There clearly was no effect for the average-poor contrast in either the postfeedback class enjoyment ( $\beta =$

-.01,  $p > .90$ ) or the competence valuation ( $\beta = .04$ ,  $p > .65$ ) analysis.<sup>8</sup>

### Discussion

The results of this study replicated and extended those of Study 1. As in Study 1, performance feedback had a direct influence on intrinsic motivation, and this direct relationship was mediated by competence valuation as well as perceived competence. That is, positive relative to negative feedback was a positive predictor of competence valuation and perceived competence, and these process variables, in turn, were positive, independent predictors of class enjoyment. When the mediational role of competence valuation and perceived competence was accounted for, the direct relationship between positive/negative feedback and class enjoyment was eliminated.

Study 2 extended the Study 1 results by clarifying the specific way in which competence valuation was used strategically. Ancillary analyses revealed that Ps receiving positive feedback reported higher competence valuation and perceived competence, which led to enhanced class enjoyment; null effects were obtained on competence valuation and class enjoyment for Ps receiving negative feedback. Study 2 also extended Study 1 by demonstrating the ecological validity of the processes under consideration.

### General Discussion

The present research was designed to investigate the strategic use of competence valuation in achievement settings and to examine the consequences of implementing this self-enhancement strategy for intrinsic motivation. Results from an experimental and a field study provided strong support for our hypotheses and validated the proposed mediational model. In both studies, Ps reported higher competence valuation following positive performance feedback relative to negative performance feedback; in turn, competence valuation was shown to be positively related to intrinsic motivation. Process analyses demonstrated that competence valuation mediated the direct relationship between positive/negative feedback and intrinsic motivation and that this mediation was independent of perceived competence, which also served as a mediator. Study 2 identified the specific direction of the observed effects. Ps receiving positive feedback reported higher competence valuation and perceived competence, which led to enhanced intrinsic motivation; the reciprocal set of processes did not appear to be operative for those receiving negative feedback.

In the intrinsic motivation literature, competence valuation is typically measured at the beginning of the task and is thought to reflect the degree to which an individ-

ual is committed to competent performance a priori. The present research broadens this conceptualization of competence valuation by examining it at a later point in the task sequence, following performance feedback (see also Sansone, 1986, 1989), and by positing that at this later point it is amenable to strategic use for self-enhancement purposes. Implicit in this conceptualization is the idea that competence valuation takes on different functional significance at different points in the process of task engagement. However, it is interesting to consider the possibility that competence valuation at the beginning of task engagement may, at times, also serve a strategic, self-enhancement function. For example, in achievement situations that carry high instrumental value and/or are accompanied by the distinct possibility of failure, some individuals may decrease their competence valuation (i.e., insist that they do not really care how they do), at least publicly, in the interests of self-esteem protection. There is no direct evidence of this a priori strategic use of competence valuation to date, although the use (and consequences) of a different a priori self-enhancement strategy, self-handicapping, has recently been documented in the intrinsic motivation literature (Deppe & Harackiewicz, 1997). It is important to note that competence valuation is positively related to intrinsic motivation, regardless of whether it is assessed prior to performing the task or after the task has been completed and feedback received.

It is interesting to contemplate the reason that competence valuation was used strategically in Study 2 following the receipt of positive performance feedback but not following the receipt of negative feedback. Motivated biases such as self-enhancement must be plausible (sensible to the dispassionate observer) to be effectively implemented (Elliot & Devine, 1994; Kunda, 1990; Sedikides & Strube, 1997), and it seems that the strategic use of competence valuation in the context of negative feedback could not pass the plausibility test. That is, for most Ps in Study 2, the achievement setting (i.e., the class) represented a part of their declared major (psychology), and it is likely that the devaluation of competence following negative feedback was not a viable avenue for self-enhancement in this instance. It is possible that in other academic situations (see Steele, 1992), or other achievement settings more generally, competence valuation may be used strategically following the receipt of positive or negative performance information. However, it also is possible that the costs of divestment from competence are so obvious and salient that this strategy is only rarely implemented—as something of a last resort (i.e., the Study 2 findings may reflect a generalizable phenomenon). Investigation of the robustness of the

Study 2 findings across different achievement settings should be a high priority on the empirical agenda.

The process results obtained in the present research represent one of the first times that both of the primary competence-relevant variables in the intrinsic motivation literature—perceived competence and competence valuation—have been validated as independent mediator variables within the same model. Several researchers have established the mediational role of each of these variables separately in various contexts; however, prior to the present work, only a single study had documented them as joint mediational mechanisms (see Harackiewicz et al.'s [1985] study employing anticipated performance and competence valuation prior to task engagement as process variables). The present results, in conjunction with those of Harackiewicz et al. (1985), suggest that investigations focusing solely on one competence-relevant process to the exclusion of the other (clearly the modal tendency in the literature) may be incomplete, if not misleading, and more generally illustrate the need to consider multiple explanatory paths in process-based analyses.

Intrinsic motivation was the outcome measure of choice in the present work; however, as alluded to in the introduction, the strategic use of competence valuation also may have implications for other important motivational and achievement-relevant outcomes. For example, the selective investment or divestment from competence may be predictive of academic performance and/or whether students persist or drop out from the intellectual domain altogether (see Steele, 1992; Vallerand, Fortier, & Guay, 1997). It is interesting to note that in considering these other potential consequences of strategic competence valuation, it may be useful to construe intrinsic motivation as an intermediary variable, accounting for the influence of competence valuation on academic performance and/or school dropout rate. That is, it is possible that strategic competence valuation has a direct impact on intrinsic motivation, which in turn serves as the proximal predictor of other, long-term consequences. Future research is needed to investigate these other outcome variables and to examine the possible dual role of intrinsic motivation as outcome and sequential mediator variables.

In the present work, we defined the self-enhancement motive as the desire to elevate the positivity of the self-concept and protect the self-concept from negative information. This definition is concordant with the prevailing view in the self-literature in which self-enhancement is portrayed as encompassing the desire to both maximize positive and minimize negative self-evaluation (see Sedikides & Strube, 1995, 1997). However, Baumeister, Tice, and colleagues (Baumeister, Tice, & Hutton, 1989; Tice, 1991; see also Rhodewalt, Morf,

Hazlett, & Fairfield, 1991; Wolfe, Lennox, & Cutler, 1986) have discussed the possibility of distinguishing between conceptually independent self-aggrandizement/enhancement (the desire to maximize positive self-evaluation) and self-protection (the desire to minimize negative self-evaluation) motives. Bifurcating the self-enhancement motive in this fashion has a conceptual parallel in the achievement motivation literature, another body of work in which the motives underlying evaluation are a central concern. For decades, achievement motivation theorists have distinguished the need for achievement (the desire to attain the pride of accomplishment) from fear of failure (the desire to avoid the shame of failure) and conceptualized these motives as independent constructs (Atkinson, 1957; Lewin, Dembo, Festinger, & Sears, 1944; McClelland, Atkinson, Clark, & Lowell, 1953; Murray, 1938; cf. Atkinson & Feather, 1966). This bifurcation in the achievement motivation literature has yielded theoretical and empirical dividends (Elliot, 1997; Heckhausen, 1991), and we believe it may be similarly beneficial in the broader literature on the self-concept as well.

A straightforward set of hypotheses that would emerge out of a bifurcation of the self-enhancement motive would be that the self-aggrandizement/enhancement motive leads to strategies focused on maximizing positive evaluation and the self-protection motive leads to strategies focused on minimizing negative evaluation. Although these hypotheses seem reasonable, we believe they represent a partial, not complete, portrait of self-evaluation involving these two motives. Another possibility is that the self-protection motive would lead to strategies focused on maximizing positive evaluation (maximizing the positive to minimize the negative). For example, individuals may raise their competence valuation following the receipt of positive feedback in an attempt to combat their pervasive fears regarding incompetence or to stockpile the benefits of positive information to help soften the blow when negative information is received. Likewise, strategies focused on minimizing negative evaluation may be used in the service of the self-aggrandizement/enhancement motive, although this type of regulation may be less prevalent than the aforementioned. The general principle that we would like to highlight is that motives and strategies are conceptually distinct entities and that these two types of construct may be combined to form a variety of different forms of self-regulation (see Elliot & Church, 1997, for a similar argument regarding motives and goals in the achievement motivation literature).

In closing, we would like to highlight the integrative nature of the present work. In the process of documenting the strategic use of competence valuation and its ramifications for intrinsic motivation, we have at-

tempted to forge a link between the intrinsic motivation and self-enhancement literatures. In addition, in the process of overviewing and discussing the obtained results, it has become evident that there are parallels and points of convergence in the literatures on achievement motivation and motivated self-evaluation. To date, theoretical and empirical work in the intrinsic motivation and achievement motivation domains has proceeded in isolation from the more general, yet clearly pertinent, work on the self-concept, and we believe that all parties involved stand to benefit greatly from the establishment of a dialogue between these conceptual camps.

#### NOTES

1. Perceived competence also can be conceptualized as an antecedent variable, as in the achievement motivation and self-regulation literatures (see Atkinson, 1957; Carver & Scheier, 1990). When used in this context, however, perceived competence is commonly discussed in terms of competence expectancies or outcome expectations.

2. In a different theoretical context, Sansone (1986) demonstrated that positive/negative feedback interacted with achievement orientation to predict competence valuation, and competence valuation, in turn, affected intrinsic motivation in interaction with ego involvement. However, there was no evidence of a direct relationship between positive/negative feedback and intrinsic motivation, and these results therefore document a complex indirect relationship between positive/negative feedback and intrinsic motivation rather than mediation per se.

3. An achievement goal variable also was manipulated in this experiment to investigate a separate set of research questions. Including the main and interactive effects of this variable in the analyses yielded results that were the same as those reported in the text (i.e., all effects reported as significant in the text remained significant).

4. Seven Ps in the experiment were excluded from analyses because they either had solved Nina puzzles prior to the experimental session (two Ps), reported that they had heard the experiment involved doing fun puzzles (two Ps), or voiced suspicion during the experimental session (three Ps). Repeating the analyses with these subsets of individuals included yielded results that were the same as those reported in the text (i.e., all effects reported as significant in the text remained significant).

5. An ancillary set of analyses were conducted to examine whether there were any actual performance differences across experimental groups and whether controlling for actual performance altered the pattern of the observed results. The results from these analyses revealed no significant group differences in performance and evidenced the same pattern of effects as those reported in the text (i.e., all effects reported as significant in the text remained significant).

6. The data for this study were collected in the context of a larger project on motivational processes in the classroom. Two of the variables used in this study (exam performance and Scholastic Aptitude Test [SAT] scores) also were used by Elliot and McGregor (1999) to investigate a conceptually distinct set of issues.

7. Preliminary analyses examining all possible interactions involving the good-average contrast revealed a significant effect for the Good-Average Contrast  $\times$  Gender interaction; this interaction was controlled for in the final analyses. The same set of preliminary interactions involving the average-poor contrast yielded no significant higher-order effects.

8. Measures of self-esteem (Rosenberg, 1965), positive mood (Brunstein, 1993), extraversion (Costa & McCrae, 1992; which some view as analogous to positive emotionality), optimism (Scheier, Carver, & Bridges, 1994), and behavioral activation system (BAS) sensitivity (Carver & White, 1994) also were available in this data set (see Note 6). We thought it would be informative to examine the robustness of the direct and indirect intrinsic motivation effects across these variables

and to test whether these variables accounted for variance in intrinsic motivation, either alone or in interaction with the feedback variables. Repeating the analyses controlling for these additional variables yielded the same results as those reported in the text (all significant relationships remained significant). In addition, none of these variables was shown to be a direct predictor of intrinsic motivation, and none of the variables interacted with any of the feedback variables in predicting intrinsic motivation.

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