

Understanding Reactions to Feedback by Integrating Ideas From Symbolic Interactionism and Cognitive Evaluation Theory

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The first 2 experiments examined how interpersonal and objective feedback influenced targets' perceptions of performance, ability, and effort. Interpersonal feedback was more influential when objective feedback was intermediate than when it was high or low. Path analyses indicated that reflected appraisals entirely mediated influences of interpersonal feedback on self-perceptions and partially mediated influences of objective feedback on self-perceptions. The 3rd experiment presented targets with high or low evaluations of ability and effort and intermediate objective feedback. Ability feedback and objective feedback influenced self-perceptions of ability and intrinsic interest. Effort feedback influenced only self-perceptions of effort. Links among feedback, reflected appraisals, self-perceptions, intrinsic interest, and performance-related behaviors confirmed predictions of symbolic interactionism and cognitive evaluation theory.

People receive evaluative feedback in nearly every aspect of daily life, including work, school, home, and even leisure and play. Consequently, understanding how people react to various types of performance evaluations has become a major area of research (e.g., Eccles & Wigfield, 1985; Greenberg & Pyszczynski, 1985; Jussim, 1986; Markus & Wurf, 1987; Moreland & Sweeney, 1984; Shrauger, 1975; Swann, Griffin, Predmore, & Gaines, 1987). In this article, we report three experiments that integrate aspects of symbolic interactionism and cognitive evaluation theory to explain how performance feedback influences self-perceptions and motivation. We begin by distinguishing between two types of feedback—interpersonal and objective.

Interpersonal and Objective Feedback

We use the term *interpersonal feedback* to refer to one person's expression to another of an evaluation of that second person's performance or competence.¹ A boss criticizing an employee, a teacher praising a student, and a coach telling an athlete that he or she had a great day are all examples of interpersonal feedback. This expression may but need not be communicated face-to-face. A letter praising colleagues for their interesting research is also an example of interpersonal feedback.

Objective feedback, by contrast, provides quantitative information about the level of a performance without any explicit evaluation of that performance. Examples of objective feedback include a salesman selling \$2,000 worth of products, a student receiving a score of 75 out of 100 on a test, or a football quarterback completing a 10-yard pass. Objective feedback also includes normative information, such as scoring in the 58th per-

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¹ Unfortunately, the term *feedback* has been used to refer to a wide range of phenomena, including behavior at any given moment, personality attributes, attitude-behavior consistency, social comparison, and objective test scores. Consequently, we use the term *interpersonal feedback* to distinguish these phenomena from others with which they could be confused.

centile of a standardized test or making it to the quarterfinals of a tennis tournament. Normative information provides quantitative information regarding the level of one's performance compared with others.

Sometimes objective feedback may be communicated interpersonally, as when a teacher informs students of their scores on a standardized math test. We consider this to be objective feedback because it includes quantitative information about level of performance; we do not consider it to be interpersonal feedback because it includes no explicit evaluation of that performance. In contrast to interpersonal feedback, which requires communication (of some sort) between two individuals, objective feedback may but need not be communicated socially. Runners may keep track of their own time when running five miles—the minute and second readings on their watches constitute objective feedback.

Conceptual Background

Our research focused on highly structured situations in which a lower status person received both objective feedback and interpersonal feedback from a higher status person regarding performance on some task. We do not deny the importance of research on situations in which only objective feedback is available or of research on situations in which only interpersonal feedback is available. These situations, however, are not the focus of our research. Our studies addressed situations in which people receive both interpersonal feedback and objective feedback. In many situations such as school, the workplace, and sports, there is potential for targets to receive both objective feedback (e.g., the number of questions correct on a test) and an interpersonal evaluation (“You did really well”).

Figure 1 presents the broad conceptual model of relations among feedback, motivation, and performance underlying this research. Presumably, evaluative feedback first influences psychological reactions, and these psychological reactions then mediate the influence of feedback on subsequent performance-related behaviors. The bottom three boxes show how the specific psychological variables emphasized in the current studies fit

into this general perspective. Our specific hypotheses were guided by two theories that address different aspects of reactions to feedback: symbolic interactionism and cognitive evaluation theory.

Symbolic Interactionism

Symbolic interactionist approaches (e.g., Cooley, 1902; Felson, 1989; Mead, 1934; Shrauger & Schoeneman, 1979; Stryker & Statham, 1985) propose that the self develops and changes as people see themselves through the eyes of others (Cooley, 1902; Mead, 1934). Metaphorically, others' evaluations function as a mirror in which one sees oneself—thus *reflected appraisals* refer to perceptions of others' evaluations, and *looking-glass self* refers to the idea that people see themselves through (their perceptions of) the eyes of others (Cooley, 1902; Felson, 1981, 1985, 1989; Mead, 1934; Shrauger & Schoeneman, 1979).

One of the central tenets of this perspective is that others' evaluations influence targets' self-concept indirectly, as mediated by targets' perceptions of those evaluations. That is, people “internalize” reflected appraisals. Despite the importance of this hypothesis to the theory, we know of no experimental research that has explicitly tested it. Some naturalistic studies have tested this hypothesis, but they have generally found only modest support for it (Felson, 1981, 1985, 1989). Numerous experiments have examined how feedback influences self-perceptions, but none have explicitly tested whether such influences occur through a process of internalization of reflected appraisals (see reviews by Bandura, 1977; Shrauger, 1975; Shrauger & Schoeneman, 1979). One major purpose of all three of our experiments, therefore, was to explicitly test this central assumption of the symbolic interactionist perspective.

Assuming an influence on self-perceptions, however, how and when does feedback influence motivation? Will any influence on self-perceptions affect motivation? Or will only certain types of influence affect motivation? These questions have been addressed by cognitive evaluation theory.

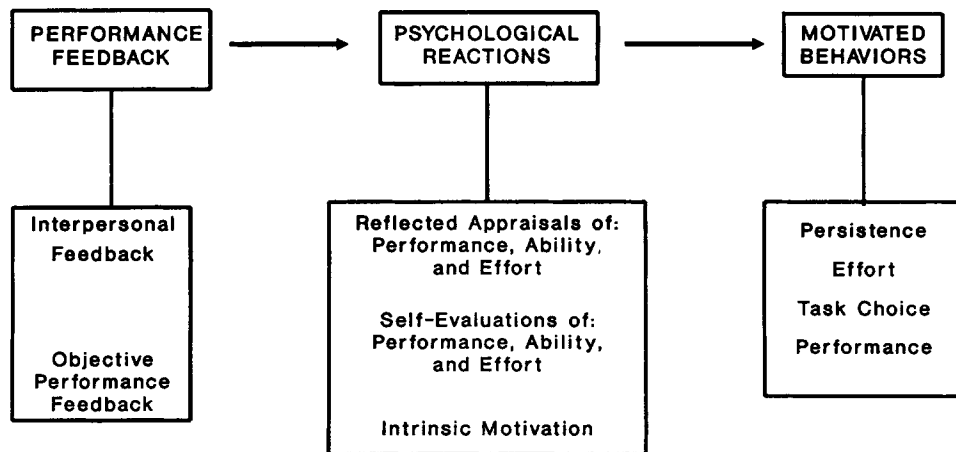


Figure 1. Conceptual model of relations among feedback, motivation, and performance.

Cognitive Evaluation Theory

Cognitive evaluation theory (Deci & Ryan, 1980; Ryan, Connell, & Deci, 1985) has addressed how performance feedback influences intrinsic motivation (liking or enjoyment of a task). This theory proposes that intrinsic motivation is enhanced by feelings of mastery and undermined by feelings of incompetence. Cognitive evaluation theory predicts that positive feedback (both interpersonal feedback and objective feedback) enhances intrinsic motivation *if* it increases feelings of mastery. Similarly, the theory predicts that negative feedback undermines intrinsic motivation *if* it decreases feelings of mastery (see also Harackiewicz & Larson, 1986; Harackiewicz, Sansone, & Manderlink, 1985; Koestner, Zuckerman, & Koestner, 1987; Sansone, 1986, 1989). Although the theory addresses other issues, too, such as autonomy, self-determination, and integration in personality, these issues are not addressed in the current studies.

Integration of Symbolic Interactionism and Cognitive Evaluation Theory

Although identifying processes by which feedback influences self-perceptions is a major focus of symbolic interactionism (e.g., Cooley, 1902; Felson, 1989; Mead, 1934), it is not a major focus of cognitive evaluation theory (Deci & Ryan, 1980, 1985). Although understanding influences on intrinsic motivation is a major focus of cognitive evaluation theory, it is not a major focus of symbolic interactionism. Deci and Ryan (1990) have recently characterized symbolic interactionist theories as focusing on the more cognitive aspects of self (reflected appraisals, self-perceptions, etc.) and cognitive evaluation theories as placing more emphasis on motivational processes. Therefore, we felt that an integration of some ideas of both theories might provide a more comprehensive picture of how performance feedback influences self-perceptions, motivation, and performance. (We are not attempting to fully integrate *all* ideas from both theories—that would be far beyond the scope of any single set of empirical studies.)

A simple integration of these two approaches suggests that two conditions are necessary for feedback to influence intrinsic motivation. First, feedback must be internalized—it must influence self-perceptions of competence. Second, self-perceptions of competence must influence intrinsic motivation. Consequently, the 1st two experiments examined conditions under which feedback and reflected appraisals were internalized. The third experiment assessed the viability of integrating the symbolic interactionist and cognitive evaluation theory perspectives. This was done by testing the hypotheses that feedback influences self-perceptions through a process of internalizing reflected appraisals and that self-perceptions (especially of ability) mediate effects of feedback on intrinsic motivation.

Study 1: Overview and Hypotheses

In many situations, people are more likely to receive positive evaluations after succeeding and negative evaluations after failing. Therefore, Study 1 addressed whether interpersonal feedback influenced reflected appraisals and self-perceptions

beyond the effects of objectively high or low test scores. This experiment used a 2 (objective feedback: high or low) \times 2 (interpersonal feedback: present or absent) design. Objective feedback was manipulated through a high or low score on an anagrams test. In the interpersonal-feedback-absent conditions, targets found out only their scores—they received no additional feedback from their evaluator. In the interpersonal-feedback-present conditions, the evaluator told targets that they received a good score when they were in the high objective feedback condition and that they did not receive a good score when they were in the low objective feedback condition.

Because this design *intentionally* confounds interpersonal feedback and objective feedback, it is uniquely appropriate for assessing whether interpersonal feedback influences targets beyond effects accounted for by clearly high or low objective feedback. After a good month, the boss may or may not praise the high sales of an employee; after a baseball player has a miserable game, the manager may or may not criticize the player. It is precisely the issue of whether the boss's praise or the manager's criticism has any effect over and above the high and low performance of the employee or player that Study 1 attempts to address.²

Influences of Interpersonal Feedback

Most directly, interpersonal feedback should influence the reflected appraisal concerning the specific performance or competence that the interpersonal feedback addresses. Interpersonal feedback regarding performance should influence reflected appraisals of performance (Coleman, Jussim, & Abraham, 1987). Interpersonal feedback regarding performance should also influence reflected appraisals of ability and effort. Compared with negative interpersonal feedback, positive interpersonal feedback leads targets to assume their evaluator views their ability and effort more favorably (Coleman et al., 1987). This probably occurs because targets make inferences regarding reflected appraisals of ability and effort on the basis of reflected appraisals of performance. Thus, the influence of interpersonal feedback regarding performance on reflected appraisals of ability and effort probably is mediated by reflected appraisals of performance. In addition, the symbolic interactionist perspective predicts that interpersonal feedback should influence self-perceptions when two conditions are met: (a) when interpersonal feedback influences reflected appraisals and (b) when those reflected appraisals are internalized.

Influences of Objective Feedback

Objective feedback, too, may influence reflected appraisals regarding performance. In many situations, targets are aware that their objective performance is known to evaluators (parents, teachers, employers, etc.). Even in the absence of interpersonal feedback, targets may assume that evaluators view their performance more favorably when their objective performance

² This study is not intended to identify orthogonal effects of interpersonal and objective feedback. It is suited for disentangling the effects of interpersonal and objective feedback when they are confounded, as they are so often in daily life.

is higher. If so, then objective feedback would also influence reflected appraisals of ability and effort, because (as previously discussed) these reflected appraisals may often be based on reflected appraisals of performance.

In addition, objective feedback should influence targets' self-perceptions, independent of reflected appraisals. In contrast to the subjective nature of interpersonal feedback, objective feedback conveys useful information diagnostic of performance level that is independent of the evaluator. In comparison with objectively failing, objectively succeeding (as indicated by extremely high or low test scores or percentile rankings) leads people to develop more positive self-evaluations, expectations, and motivation (e.g., Bandura, 1977; Eccles & Wigfield, 1985; Feather, 1966; Moreland & Sweeney, 1984; Sansone, 1986; Sansone, Sachau, & Weir, 1989). Thus, targets who perform well generally view their performance more favorably than those who perform poorly. Although objective feedback conveys no direct information regarding targets' own ability, people generally infer ability from performance (Bandura, 1977; Eccles & Wigfield, 1985; Heider, 1958; Weiner, 1979). This means that objective feedback may also influence self-perceptions of ability through its influence on self-perceptions of performance.

In contrast, because effort is a behavior (rather than an underlying attribute such as ability), targets may have a clear sense of how hard they tried regardless of the outcome. This would mean that they would not actually infer effort on the basis of performance. Perhaps, however, high performance creates a "glow of success" whereby targets also assume that their effort was high. Thus, we also examined relations between self-perceptions of performance and self-perceptions of effort.

Method

Subjects

Subjects were 96 introductory psychology students who participated to fulfill a course requirement. Six were highly suspicious regarding the purposes of the study. Their data, therefore, were eliminated from all analyses, which were then based on 37 men, 51 women, and 2 subjects who did not report their sex.

Materials

Anagram tests. All subjects took a test that involved solving 15 anagrams. To create the two objective feedback conditions, we designed one test to produce high scores ($M = 13.10$) and another to produce low scores ($M = 2.76$).

Questionnaire. A questionnaire assessed subjects' self-perceptions and reflected appraisals. This included subjects' self-perceptions of performance, ability, and effort and reflected appraisals (their perceptions of their teacher's view) of their performance, ability, and effort.

Each variable was assessed twice; all used 10-point (0–9) scales. Self-perceptions of performance were assessed with (a) one question asking how well subjects felt they performed and (b) another question asking them to rate their score on the test. Self-perceptions of ability were assessed with (a) one question regarding how much ability they felt they had to solve anagrams and (b) another question regarding how good they felt they were at solving anagrams. Self-perceptions of effort were assessed with (a) one question asking how hard they tried to solve the anagrams and (b) another question asking how much effort they exerted in trying to solve the anagrams.

Additional questions assessing reflected appraisals were nearly identical to the self-perception questions. The only exception was that they referred to how the teacher viewed them rather than to how they viewed themselves. The self-perception and reflected appraisal questions were interspersed with many others regarding their reactions to the "training program" (as discussed in the Procedures section).

Confederates

Four male actors were paid to be confederates. They were trained to play the role of a teacher and to express the three interpersonal feedback responses (positive, negative, and none). Pretesting ensured that most subjects perceived the interpersonal feedback they conveyed as it was intended. Examples of interpersonal feedback are "You have 13 out of 15 right—that's a very good score" (positive); "You have 3 out of 15 right—that's not a very good score" (negative); and "You have 3 [13] out of 15 right" (none).

Confederates were blind to the purposes of the study. Furthermore, they were not informed of the feedback they were to convey until immediately prior to conveying it. Consequently, teachers' knowledge of the feedback condition did not affect any of their initial interactions with the subjects.

Procedures

When they arrived, subjects were told by an experimenter that they were about to participate in an experimental program designed for the training of future teachers. Before beginning, subjects completed a consent form and were informed that their responses to the questionnaires would remain completely anonymous and confidential.

The experimenter then presented the following cover story:

Now let me tell you about the training program. You and a graduate student in education will comprise one of several teacher–student teams involved in performing a series of tasks (you will be the student and he will be the teacher). Your team will be compared to other teacher–student teams on test scores. Also, your teacher will evaluate your results and discuss them with me. After each task you will be asked to complete a questionnaire concerning your experiences as a student in this program. Do you have any questions?

One purpose of this cover story was to highlight the evaluation and the comparison among teams and to implicitly emphasize to subjects the importance of performing well. It also provided a context in which the teacher's evaluative reaction to subjects' performance would appear appropriate.

Each subject was introduced to the teacher, who then gave the subject a brief lesson on how to solve anagrams. Teachers interacted with 1 subject per session. The lesson described anagrams, provided some strategies for solving them, and included some illustrative examples. Next, the teacher handed the subject the test, informed the subject of the 8-min time limit for solving them, and left the room.

When 8 min had elapsed, the teacher returned to the room and gave the subject an answer sheet. Subjects then checked over their own test and wrote the number correct on the top of the test sheet. The teacher looked over the subject's test and responded with one of the three interpersonal feedback responses.

The teacher then left the room. Next, the experimenter returned and explained that the teacher was organizing a second lesson on anagrams and a second test. In the (alleged) interim, subjects were asked to complete a questionnaire assessing their experiences in the training program thus far. After completing the questionnaire, subjects were informed that the experiment was actually over, and they were debriefed.

Results and Discussion

Initial Analyses

Self-perceptions and reflected appraisals of performance, ability, and effort were assessed with two questions each. The correlations between these pairs of questions were all quite high (correlations for each pair were above .8). Therefore, we summed these pairs of items to form a two-question scale for each variable.

In all three studies, manipulation checks revealed that most targets perceived the feedback as intended. The proportions of subjects perceiving positive feedback as positive, negative as negative, and none as none averaged about 86% for the three studies (and ranged from 78% to 96%) and are not discussed further. In Study 1 (and again in the remaining two studies) initial analyses found few sex differences or confederate effects. Therefore, these effects are not discussed.

Effects of Objective Feedback

A series of analyses of variance (ANOVAs) supported our hypotheses regarding the effects of objective performance on reflected appraisals and self-perceptions. There were main effects of objective feedback on reflected appraisals of performance, $F(1, 84) = 215.83, p < .0001$; ability, $F(1, 84) = 104.74, p < .0001$; and effort, $F(1, 84) = 30.17, p < .0001$. The cell means in Table 1 show that in all comparisons, targets receiving a high score perceived the teacher as evaluating their performance, ability, and effort more favorably than did targets receiving a low score.

There also were main effects for objective feedback on all three self-perception variables: performance, $F(1, 85) = 284.48, p < .0001$; ability, $F(1, 85) = 44.55, p < .0001$; and effort, $F(1, 85) = 3.56, p < .07$. The cell means in Table 1 show that targets who received a high score evaluated their own performance, ability, and effort more favorably than did targets who received a low score.

Effects of Interpersonal Feedback

As expected, there were no main effects of interpersonal feedback (present vs. absent) on any dependent variable. Consequently, the next set of analyses assessed whether interpersonal feedback influenced targets beyond effects accounted for by objective feedback.

Results showed that interpersonal feedback did indeed influence reflected appraisals beyond effects accounted for by objective feedback. The interaction between objective feedback and interpersonal feedback was significant for reflected appraisals of performance, $F(1, 84) = 5.15, p < .03$, and for reflected appraisals of ability, $F(1, 84) = 5.37, p < .03$. As can be seen from the cell means in Table 1, for these reflected appraisals, the difference between the two interpersonal-feedback-present conditions is larger than the difference between the two interpersonal-feedback-absent conditions. The interaction did not reach significance for reflected appraisals of effort, $F(1, 84) = 1.49, p > .2$. These results suggest that when an evaluator simply informs a target of something they presumably know—that they failed after failing (or succeeded after succeeding)—targets assume that their evaluator views their performance and ability even more unfavorably (or favorably).

The pattern of cell means in Table 1 also suggests that interpersonal feedback influenced self-perceptions beyond effects of objective feedback. However, the interaction between interpersonal feedback and objective feedback was not significant for any of the self-perception variables: self-perceptions of performance ($F < 1, ns$); self-perceptions of ability, $F(1, 85) = 1.92, p < .2$; and self-perceptions of effort, $F(1, 85) = 1.83, p < .2$.

Process Analysis: Models of Relations Among Feedback, Reflected Appraisals, and Self-Perceptions

Causal modeling techniques were used to explicitly test the predictions derived from the symbolic interactionist perspective. All models were assessed with the LISREL VI program.

Table 1
Cell Means for All Dependent Variables: Study 1

Dependent variable	No interpersonal feedback		Interpersonal feedback	
	Low score (<i>n</i> = 18)	High score (<i>n</i> = 21)	Low score (<i>n</i> = 24)	High score (<i>n</i> = 23)
Reflected appraisals				
Performance	4.67	12.04	3.13	13.25
Ability	5.78	10.78	3.74	11.75
Effort	8.50	11.57	8.30	13.17
Self-perceptions				
Performance	2.28	13.30	1.76 ^a	13.50
Ability	6.17	11.04	4.17 ^a	11.67
Effort	12.83	13.09	13.13 ^a	15.17

Note. Reflected appraisals refer to targets' perceptions of their evaluator's view of them. In the two interpersonal feedback conditions, targets received negative feedback after a low score and positive feedback after a high score. In the two no feedback conditions, targets did not receive any interpersonal feedback. Higher scores indicate higher levels of perceived performance, ability, and effort.

^a *n* = 25.

Because of the relatively small sample and the relatively large number of parameters that would be needed to estimate a full measurement and structural model (over 50), these analyses focus on relations among the items used in the previous ANOVAs. The main advantages to using LISREL, therefore, were to obtain measures of goodness of fit with which to compare alternative models and to assess a full model simultaneously. Measurement error is not estimated or removed using this technique (nor is it usually removed in analyses using regression and ANOVA).

Assumptions regarding direct effects and mediation. We proposed that (a) the only direct influence of interpersonal feedback would be on reflected appraisals of performance; (b) the only direct influences of objective feedback would be on reflected appraisals and self-perceptions of performance; (c) reflected appraisals of performance would influence reflected appraisals of ability and effort; and (d) self-perceptions of performance would influence self-perceptions of ability and effort.

Except for influences of interpersonal feedback and objective feedback, all paths estimated in all models are based on correlational data. Consequently, evidence regarding the hypothesized causal relations would be more convincing if plausible alternative causal relations could be ruled out. Therefore, our first set of analyses assessed whether models making alternative assumptions could be eliminated.

A "no mediation" model? The first alternative model assumed no mediation at all—all relations among the dependent variables were assumed to result solely from spurious relations with the manipulated variables. This model assumed that interpersonal feedback and objective feedback directly influenced each dependent variable and that there were no causal relations among dependent variables. This model failed to account for the data, $\chi^2(15, N = 87) = 201.71, p < .0001$. Consequently, we next assessed several models of causal relations among the dependent variables.

Assumptions identical across all remaining models. There were neither theoretical reasons nor empirical evidence in the ANOVAs for assuming any main effects of the interpersonal feedback (present vs. absent) variable. Thus, all models described below included interpersonal feedback (present vs. absent) as an exogenous variable with no influences on any dependent variable. In addition, none of the models described below assumed causal relations among reflected appraisals of effort and ability. Therefore, the error terms for these variables were left unconstrained (they were allowed to correlate). Similarly, because we specified no causal relations among self-perceptions of effort and ability, the error terms for these variables were left unconstrained.

Alternative mediational assumptions. We assessed several models assuming relations among dependent variables that were different than those that we hypothesized. These alternative models assumed (a) objective feedback directly influenced self and reflected appraisals of effort and ability; (b) interpersonal feedback directly influenced reflected appraisals of effort and ability; (c) teacher and self-perceptions of effort and ability then influenced teacher and self-perceptions of performance, respectively; and/or (d) interpersonal feedback in-

fluenced self-perceptions, which then influenced reflected appraisals. All such models failed to fit the data (all chi-squares were below .01).

These analyses ruled out numerous models that assumed causal relations different than those we hypothesized. Consequently, the next model incorporated the hypothesized causal relations among interpersonal feedback, objective feedback, reflected appraisals, and self-perceptions.

Internalization model. The internalization model proposes that reflected appraisals influence targets' self-perceptions. Results for the internalization model are depicted in Figure 2. The path estimates (and those in all subsequent figures and analyses) are interpretable exactly as standardized betas from a regression analysis. The box labeled *Interpersonal Feedback* in Figure 2 refers to the interaction between interpersonal feedback (present or absent) and objective performance (high or low). Exactly as in the ANOVAs, this is the term that represents whether interpersonal feedback influenced subjects beyond the effects of objective feedback.

This model fit the data, $\chi^2(21, N = 87) = 28.78, p > .10$. Because the chi-square test is not very powerful for small samples, we used two indexes of fit provided by the LISREL program: the goodness-of-fit index (GFI) and the adjusted goodness-of-fit index (AGFI) that tend to *underestimate* fit in small samples (Bollen, 1990). Given our relatively small sample, these indexes seemed like an appropriately conservative second approach to assessing fit (i.e., less likely to show that the model fits well) and are used here and in both subsequent studies. Values above .9 for the GFI and above .8 for the AGFI are generally interpreted as representing good fit. These indexes indicated that the fit of the internalization model was not simply due to small sample size (GFI = .936; AGFI = .840).

The path coefficients were consistent with the symbolic interactionist predictions. All three paths representing internalization were significant: $B = .545, p < .0001$, for the effect of reflected appraisals of performance on self-perceptions of performance; $B = .410, p < .0001$, for the effect of reflected appraisals of ability on self-perceptions of ability; and $B = .485, p < .0001$, for the effect of reflected appraisals of effort on self-perceptions of effort (see Figure 2).

Results were also consistent with most of the hypothesized relations among perceptions of performance, ability, and effort. Specifically, the path coefficients relating reflected appraisals of performance to reflected appraisals of ability ($B = .870, p < .0001$) and to reflected appraisals of effort ($B = .624, p < .0001$) were high and significant (see Figure 2). These analyses are consistent with the idea that targets used their perception of the teacher's evaluation of their performance as a major basis for inferences regarding the teacher's perceptions of their ability and effort—higher reflected appraisals of performance led to higher reflected appraisals of ability and effort.

These analyses were also consistent with the hypothesis that targets inferred their ability on the basis of their perceptions of their performance ($B = .437, p < .0001$). Self-perceptions of effort, however, were essentially unrelated to self-perceptions of performance ($B = -.149, ns$). Thus, targets assumed that they had more ability, but not that they tried harder, when they felt that they performed better.

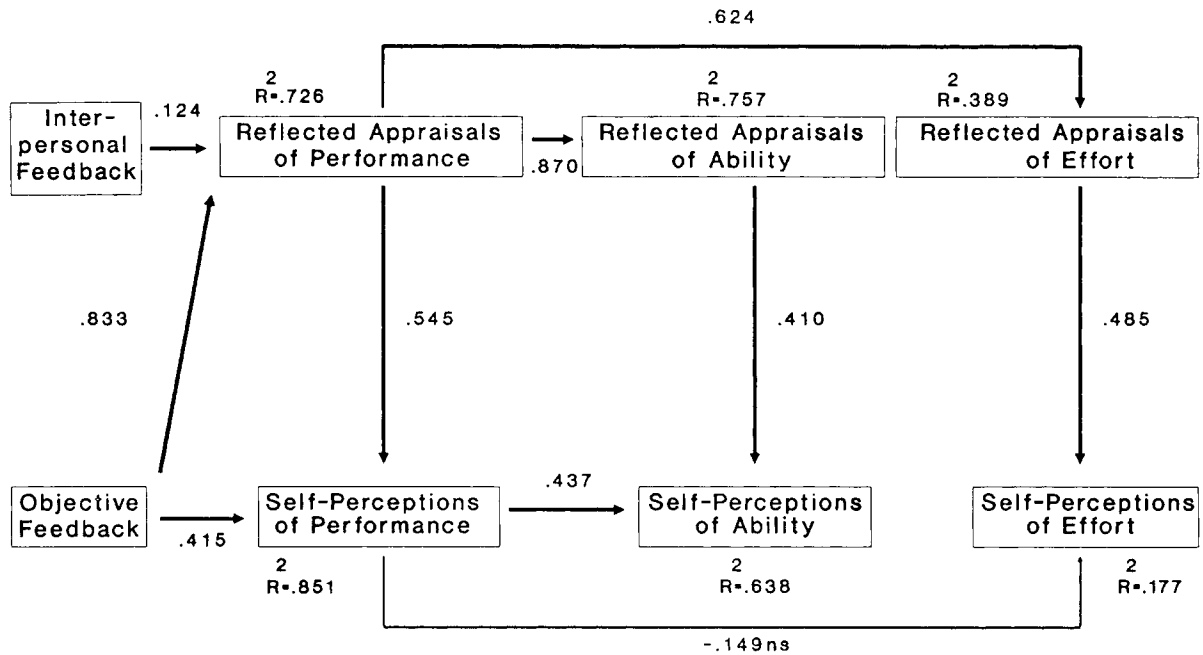


Figure 2. Internalization model: Study 1. (Reflected appraisals refer to targets' perceptions of the evaluator's view of them. Although the main effect for interpersonal feedback (present or absent) was included in the model, it is not shown because it did not relate to any variable. The box labeled *Interpersonal Feedback* represents the interaction between the interpersonal feedback and objective feedback manipulations. All paths are significant at $p < .05$, except where indicated by *ns*. Nonsignificant paths are also indicated by noticeably thinner arrows. All coefficients are standardized.)

Projection. In a process directly opposed to internalization, people sometimes infer others' perceptions of them on the basis of their perceptions of themselves. The process by which self-perceptions influence reflected appraisals is referred to as *projection*. Projection effects have been found in numerous studies (Bohrnstedt & Felson, 1983; Felson, 1985; Jussim, Coleman, & Nassau, 1987; Jussim & Osgood, 1989). Therefore, it is inappropriate to assume that associations between self-perceptions and reflected appraisals represent internalization until projection effects have been ruled out (see also Shrauger & Schoeneman, 1979).

Consequently, we assessed a projection model, which was identical to the internalization model, except for reversing the direction of the paths representing internalization (the three vertical paths in Figure 2). The projection model posits that self-perceptions influence reflected appraisals. The projection model, however, did not account for the data, $\chi^2(21, N = 87) = 33.62, p < .05$.³

Study 2

In Study 1, interpersonal feedback had no significant influence on any of the self-perceptions we assessed. According to the internalization model, this occurred mainly because the effect of the interpersonal feedback on reflected appraisals of performance was relatively small. Because the objective performance feedback was so clearly high or low, targets may not have viewed the interpersonal feedback as providing much addi-

tional information regarding the teacher's view of them. If this is true, then perhaps when objective performance is more intermediate (e.g., 8 or 9 out of 15, instead of 3 or 13), interpersonal feedback would have more influence on reflected appraisals. If the symbolic interactionist predictions are true, this would lead to greater influence of interpersonal feedback on self-perceptions through the internalization of the reflected appraisal process.

Alternatively, however, when objective performance is intermediate, targets may feel it provides less information regarding reflected appraisals. Consequently, they may rely more heavily on their own self-perceptions as a basis for inferring reflected appraisals. If so, rather than finding internalization, Study 2 may find stronger support for the projection hypothesis. Therefore, Study 2 compared these two perspectives regarding how targets respond to interpersonal feedback when objective feedback is intermediate.

³ It might be useful to compare the fit of the projection model to the fit of the internalization model. One can, however, only compare the fit of two models that are nested, namely, when the paths in one model are a subset of those in another model (see, e.g., Bentler & Bonett, 1980). Unfortunately, the internalization model and projection model are not nested, so that no such direct comparison is possible. However, it is appropriate to conclude that the internalization model in Study 1 is not significantly poorer than a perfect model (this is what the chi-square test indicates) and that the projection model is significantly poorer than a perfect model.

Method

Study 2 used essentially the same methods and procedures as Study 1, with one important exception—we used an anagrams test, created through pretesting, that produced intermediate performance, rather than clearly high or low performance. The average score on this test was 8.6 (out of 15).⁴

Self- and reflected appraisals of ability and effort were each assessed once (rather than twice as in Study 1). Self- and reflected appraisals of performance variables were still assessed twice. Study 2 also involved procedures that expanded the focus of Study 1 in two ways. First, we assessed relations among feedback and global self-esteem, using procedures similar to those employed by Greenberg & Pyszczynski (1985). We repeated this again in Study 3. Neither study found significant effects of either objective feedback or interpersonal feedback on global self-esteem. In addition, we found minimal evidence that initial self-esteem moderated reactions to feedback (4 significant interactions out of a possible 38 across the two studies). Thus, the self-esteem aspects of Studies 2 and 3 are not discussed further.

Another change was that we used two control conditions in Study 2. One control condition was identical to that used in Study 1 (“You got 9 right”). We also added an intermediate feedback condition (“You got 9 right. That is OK. It’s not so good, it’s not so bad”). Analyses showed, however, that reactions to no feedback and intermediate feedback were quite similar—there were never any significant differences between these conditions and their means were almost identical. Thus, these two groups were collapsed into a single group that we refer to as *neutral feedback*. The positive feedback and negative feedback manipulations were identical to those used in Study 1 (e.g., “You got 9 right. That’s [not] a very good score”).

Subjects were 197 introductory psychology students who participated to fulfill a course requirement. Twenty-three were suspicious regarding the purposes of the study, and their data were dropped from all analyses. This left 174 subjects (70 men and 104 women).

Results and Discussion

Analyses of Covariance (ANCOVAs)

Interpersonal feedback. An initial set of one-way ANCOVAs examined the impact of interpersonal feedback on each of the dependent variables, controlling for objective feedback (test score). Because objective feedback was essentially uncorrelated with interpersonal feedback in this study, adjusted cell means were nearly identical to observed cell means. Table 2 presents the observed cell means for all six dependent variables.

As predicted, interpersonal feedback had much more impact than in Study 1. Interpersonal feedback significantly influenced all three reflected appraisals: performance, $F(2, 170) = 37.57, p < .0001$; ability, $F(2, 169) = 11.65, p < .001$; effort, $F(2, 169) = 11.86, p < .001$. Interpersonal feedback also significantly influenced self-perceptions of performance, $F(2, 170) = 12.15, p < .001$; and ability, $F(2, 170) = 3.11, p < .05$. The effect of interpersonal feedback on self-perceptions of effort was not significant ($F < 1$). As indicated in Table 2, Bonferroni contrasts showed that, with the exception of self-perceptions of effort, recipients of positive feedback viewed themselves, and assumed that the teacher viewed them, most favorably on all dependent variables. In addition, most comparisons showed that reactions to no feedback were significantly lower than reactions to positive feedback and significantly higher than reactions to negative feedback.

Table 2
Cell Means for All Dependent Variables: Study 2

Dependent variable	Interpersonal Feedback		
	Positive (n = 46)	Neutral (n = 91)	Negative (n = 37)
Reflected appraisals			
Performance	11.02 _a	8.64 _b	5.54 _c
Ability	5.44 _a *	4.62 _b	3.62 _c
Effort	6.58 _a *	5.46 _b	4.70 _b
Self-perceptions			
Performance	10.20 _a	8.46 _b	6.54 _c
Ability	5.28 _a	4.60 _b	4.35 _b
Effort	7.57	7.40	7.43

Note. Reflected appraisals refer to targets’ perceptions of their evaluator’s view of them. Higher scores indicate higher levels of perceived performance, ability, and effort. Means with different subscripts are significantly different at $p < .05$.

* $n = 45$.

Objective feedback. Objective feedback significantly related to all dependent variables, except reflected appraisals of effort, $F(1, 169) = 2.52, p < .12$. This included reflected appraisals of performance, $F(1, 170) = 34.03, p < .0001$; reflected appraisals of ability, $F(1, 169) = 12.36, p < .001$; self-perceptions of performance, $F(1, 170) = 53.20, p < .0001$; self-perceptions of ability, $F(1, 170) = 14.19, p < .001$; and self-perceptions of effort, $F(1, 170) = 9.20, p < .003$. These results are generally consistent with findings from Study 1 in suggesting that not only did objective feedback influence self-perceptions, it also influenced reflected appraisals.

Process Analysis: Causal Models

Causal modeling procedures virtually identical to those used in Study 1 were used to assess several alternative models. In all models, we coded interpersonal feedback as a single variable with the values 1, 2, and 3 for negative feedback, neutral feedback, and positive feedback, respectively. We felt that this was justified because (a) the ordering of the means in each group appeared essentially linear (see Table 2); (b) analyses employing two dummy variables to represent effects of interpersonal feedback (this is the classic regression approach to ANOVA—see, e.g., Pedhazur, 1982) yielded results virtually identical to those obtained with our coding; and (c) in this way, we obtained a single coefficient for interpersonal feedback, rendering presentation of the results simpler and more comprehensible.

No mediation model. As in Study 1, we first tested a model that assumed that interpersonal feedback and objective feedback influenced all of the dependent variables and that there

⁴ The range of scores was 5 to 13. Because we believed that scores higher than 11 and lower than 7 might be seen as unambiguously positive and negative, respectively, we compared two sets of initial analyses. The first excluded all subjects who scored outside of the 7–11 range (30 subjects). The second set of analyses included all 174 subjects. These two analyses yielded nearly identical results, so we report analyses based on all 174 subjects.

were no other relations among the dependent variables. This model failed to account for the data, $\chi^2(15, N = 87) = 341.55$, $p < .0001$. Consequently, we tested several models assuming a variety of relations among the dependent variables.

Alternative mediational assumptions. As in Study 1, we tested models proposing mediational assumptions opposite to those we hypothesized. As in Study 1, all such models failed to account for the data (all chi-squares were below .01).

Internalization model. First, we tested Study 2's version of the internalization model. The only difference from Study 1 was that the effect of interpersonal feedback, rather than its interaction with objective feedback, is its main effect and that there was no factor equivalent to interpersonal feedback (present vs. absent). This model did not fit the data, $\chi^2(15, N = 173) = 26.35$, $p < .04$.

Projection model. We next tested the projection model, which also failed to fit the data, $\chi^2(15, N = 173) = 42.67$, $p < .001$.

An internalization and projection model. None of the models assessed so far provided a good account of our data. However, the internalization model and the projection model are not mutually exclusive. Not only is it hypothetically possible that both internalization and projection may co-occur, empirical research has demonstrated that sometimes they do co-occur (Jussim & Osgood, 1989). Thus, we next tested a model that included all paths specified by both the internalization model and the projection model.

This meant that we assessed a model including reciprocal paths between (a) reflected appraisals of performance and self-perceptions of performance, (b) reflected appraisals of ability and self-perceptions of ability, and (c) reflected appraisals of effort and self-perceptions of effort. For models with reciprocal paths to be identified, there must be at least one instrumental variable—a variable outside the reciprocal system that influences one, but not the other, of the two variables in the reciprocal system (see, e.g., Kenny, 1979). As can be seen in Figure 3, which presents the results for this model, this condition is met for all three pairs of variables involved in reciprocal relations. We refer to this model as the *internalization and projection model*.⁵

This model fit the data, $\chi^2(12, N = 173) = 15.58$, $p > .2$. Figure 3 shows why a model mixing internalization and projection was needed to account for the data. These analyses showed significant internalization of reflected appraisals of performance ($B = .644$, $p < .0001$), but no significant internalization of either reflected appraisals of ability ($B = .135$, *ns*) or reflected appraisals of effort ($B = .093$, *ns*). Although these analyses showed no projection of self-perceptions of performance ($B = .071$, *ns*), they showed significant projection of self-perceptions of ability ($B = .213$, $p < .02$) and of self-perceptions of effort ($B = .278$, $p < .02$). Thus, these analyses showed internalization only for reflected appraisals of performance and projection only for self-perceptions of ability and effort.

As in Study 1, reflected appraisals of performance influenced reflected appraisals of ability ($B = .602$, $p < .0001$) and effort ($B = .512$, $p < .0001$). Thus, targets again assumed that the teacher held a more favorable view of their ability and effort when they believed that the teacher evaluated their performance more favorably. Also as in Study 1, self-perceptions of

performance influenced self-perceptions of ability ($B = .494$, $p < .0001$), but not self-perceptions of effort ($B = .159$, $p < .2$). Thus, targets again apparently inferred their level of ability to solve anagrams, but not their effort, from their performance.

The internalization and projection model provided partial support for the symbolic interactionist perspective. Results showing internalization of reflected appraisals of performance were consistent with the perspective. In addition, even the internalization and projection model was consistent with the symbolic interactionist prediction that *if* interpersonal feedback influences self-perceptions, it occurs through a process of internalization of reflected appraisals. Results suggesting projection of self-perceptions of effort and ability were not consistent with symbolic interactionist predictions.

Results showing that interpersonal feedback influenced self-perceptions of ability, even though there was no internalization of reflected appraisals of ability, might appear inconsistent with the symbolic interactionist predictions. The internalization and projection model, however, shows why this effect actually is consistent with symbolic interactionist predictions. According to the model (see Figure 3), this effect occurred because (a) interpersonal feedback influenced reflected appraisals of performance, (b) these reflected appraisals influenced self-perceptions of performance, and (c) targets based their self-perceptions of ability on their self-perceptions of performance. The internalization and projection model suggests that interpersonal feedback would have no influence on self-perceptions of ability if it was not for internalization of reflected appraisals of performance.

Could an internalization and projection model account for Study 1 data? This raises the possibility that an internalization and projection model would have similarly accounted for the data in Study 1. Unfortunately, however, we were unable to test an identical version of this model in Study 1. An internalization and projection model would not have been adequately identified because there was no instrumental variable appropriate for estimating the reciprocal relations among reflected appraisals of performance and self-perceptions of performance. The small effect of interpersonal feedback on reflected appraisals of performance in Study 1 rendered it inappropriate to use interpersonal feedback as an instrumental variable (see, e.g., Kenny, 1979, for a discussion of reciprocal paths and instrumental variables).

We did, however, try the next best thing. We estimated a

⁵ On the basis of the comments provided in some reviews of previous drafts of this article, it seems clear that some researchers believe that one cannot estimate reciprocal paths unless one has an instrumental variable for *both* of the two variables involved in a reciprocal system. This is not true—see the discussion of this issue appearing in Kenny's (1979) *Correlation and Causality* (pp. 99–101). However, if there is only one instrumental variable, one must assume that the error terms of the variables involved in the reciprocal relationship are uncorrelated (otherwise the model is not identified). One reviewer suggested that although this assumption does not bias the estimates of the paths involved in the reciprocal relationship, it does make them less efficient. This seemed to us to be a cost worth incurring in order to have the opportunity to directly assess the hypothesized reciprocal relationships.

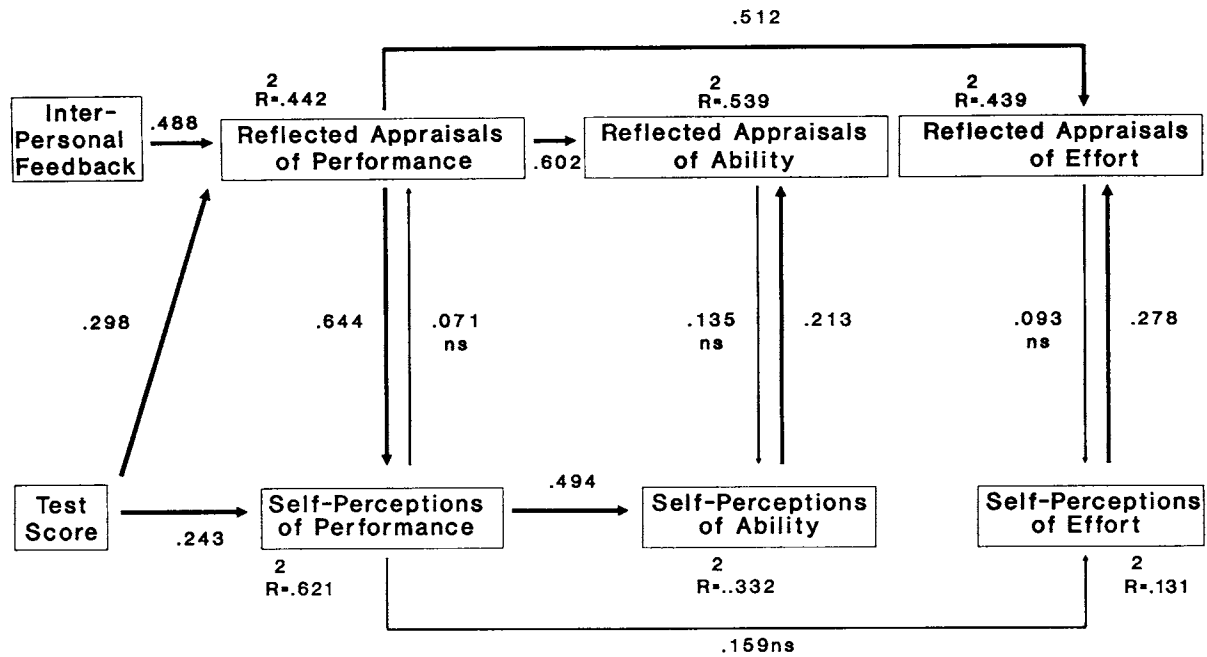


Figure 3. Internalization and projection model: Study 2. (Reflected appraisals refer to targets' perceptions of the evaluator's view of them. All paths are significant at $p < .05$, except where indicated by ns. Nonsignificant paths are also indicated by noticeably thinner arrows. All coefficients are standardized.)

version of the internalization and projection model that simply excluded the three nonsignificant vertical paths depicted in Figure 3. This model failed to account for the data, $\chi^2(21, N = 173) = 34.32, p < .04$. We conclude, therefore, that the pattern of significant causal effects depicted in Figure 3 does not account for the data in Study 1.

Reconciling Differences in Causal Modeling Results for Studies 1 and 2

The primary difference between Studies 1 and 2 involved the extremity of the objective feedback—in Study 1, objective feedback was high or low, but in Study 2, objective feedback was intermediate. How might this account for the causal modeling results showing more internalization in Study 1 than in Study 2?

In general, positive evaluations on the basis of high objective performance are probably more credible than positive evaluations on the basis of intermediate performance, and negative evaluations on the basis of low performance probably are more credible than negative evaluations based on intermediate performance. Highly credible evaluations are more likely to be internalized (Shrauger, 1975; Shrauger & Schoeneman, 1979).

Although this might explain why there was less internalization of reflected appraisals in Study 2, it does not explain why reflected appraisals of performance were internalized or why projection occurred for perceptions of ability and effort. It may be that when the objective basis for the evaluation is not as clear, targets are most susceptible to internalizing the reflected appraisal explicitly conveyed by the interpersonal feedback. Because the interpersonal feedback in Study 2 focused on performance, it was only reflected appraisals of performance that

were internalized. If this account is true, however, when interpersonal feedback focuses on ability or effort (in the context of intermediate objective feedback), it, too, would indeed be internalized. We refer to the idea that targets internalize only the aspect of the interpersonal feedback that is explicitly conveyed (when objective feedback is intermediate) as the *internalization specificity* hypothesis.

Projection effects may have occurred in Study 2 because the lowered credibility of the feedback lessened its implications for reflected appraisals of ability and effort. This is consistent with the pattern of lower path coefficients relating reflected appraisals of performance to reflected appraisals of ability and effort in Study 2 in comparison with those obtained in Study 1 (compare Figures 2 and 3). Consequently, targets may have relied more on their self-perceptions in arriving at judgments of the teacher's perceptions of their ability and effort. This explanation is consistent with research showing that projection effects are generally more likely to occur when the other's evaluations are more ambiguous (e.g., Bohrnstedt & Felson, 1983; Felson, 1981, 1985; Jussim & Osgood, 1989).

Study 3

The central purpose of Study 3 was to test our proposed integration of symbolic interactionism and cognitive evaluation theory. This integration suggested that feedback is linked to intrinsic motivation in two broad stages. First, interpersonal feedback must be internalized—feedback must influence self-perceptions of competence. Second, self-perceptions of competence must influence intrinsic motivation.

Internalization

In Study 3 we also assessed hypotheses regarding differences in results between the first two studies. Our conceptual integration of the first two studies suggested that interpersonal feedback has little influence on self-perceptions when objective performance is clearly high or low. However, interpersonal feedback should more strongly influence self-perceptions when (a) objective performance is intermediate and (b) the content of the interpersonal feedback explicitly conveys a particular reflected appraisal.

Study 3, therefore, provided a partial test of this integration. Study 3 focused on intermediate or ambiguous objective performance, so that the main hypothesis was that targets would internalize the specific content of the interpersonal feedback. This means that (a) evaluations of ability should influence self-perceptions of ability; (b) evaluations of effort should influence self-perceptions of effort; and (c) there would be no crossover influence—evaluations of ability should have little effect on self-perceptions of effort, and evaluations of effort should have little effect on self-perceptions of ability. In Study 3, therefore, we manipulated evaluations of ability and effort.

Intrinsic Motivation

Study 3 also examined cognitive evaluation theory hypotheses regarding the processes linking feedback, self-perceptions, intrinsic motivation, and performance-related behaviors. Cognitive evaluation theory (e.g., Deci & Ryan, 1980) specifies three steps in relations among feedback, self-perceptions, intrinsic motivation, and performance-related behaviors: (a) Feedback influences self-perceptions of competence, (b) self-perceptions of competence influence intrinsic motivation; and (c) intrinsic motivation influences performance-related behaviors. Numerous studies have demonstrated effects of reward or feedback on task choice or intrinsic motivation or have shown relations among perceptions of competence and intrinsic motivation (e.g., Deci & Ryan, 1980; Harackiewicz, Abrahams & Wageman, 1987; Harackiewicz & Larson, 1986; Harackiewicz et al., 1985; Jussim, Coleman, & Nassau, 1989; Lepper, Greene, & Nisbett, 1973; Ryan et al., 1985; Sansone, 1986, 1989; Sansone et al., 1989). Nonetheless, we are not aware of research documenting the entire set of links among feedback, perceptions of competence, intrinsic interest, and performance-related behaviors specified by the theory within a single study.

This is important because it is possible that, for example, feedback may influence task choice directly, without mediation by intrinsic motivation. Research showing that feedback influences task choice (e.g., Koestner et al., 1987) may confirm predictions of the theory even if intrinsic motivation does not mediate those effects of feedback on task choice. Similarly, other research has shown that feedback influences self-perceptions of competence and intrinsic motivation, without showing that those self-perceptions or intrinsic motivation actually influence behaviors such as task choice, persistence, or performance (Harackiewicz et al., 1987; Sansone, 1986, 1989; Vallerand & Reid, 1984, 1988). Some researchers have gone so far as to suggest that this failure to actually measure hypothesized mediating variables and assess their effects on behavior constitutes a

“serious problem” with the cognitive evaluation theory approach to intrinsic motivation (Locke & Latham, 1990). Study 3, therefore, was designed to redress this serious problem by explicitly assessing the processes mediating effects of feedback on motivation and performance.

Study 3 assessed two sets of predictions derived from cognitive evaluation theory. This theory predicts that interpersonal feedback will influence intrinsic interest in the anagrams task *if* it also influences self-perceptions of ability at anagrams (Deci & Ryan, 1980, 1985; Koestner et al., 1987). If targets internalize only the explicit aspects of the feedback they receive, ability feedback, far more than effort feedback, should increase intrinsic interest. This is because ability feedback should increase feelings of competence (self-perceptions of ability) much more than effort feedback. As shown in Studies 1 and 2, objective feedback also influences self-perceptions of ability. Consequently, objective feedback, too, should influence intrinsic motivation.

Study 3 also assessed cognitive evaluation theory predictions regarding relations among self-perceptions, intrinsic motivation, and achievement-related behaviors. Cognitive evaluation theory predicts that self-perceptions influence achievement-related behaviors mainly because they influence intrinsic motivation. That is, intrinsic motivation should mediate effects of self-perceptions on outcomes such as task choice, persistence, and performance.

Method

Subjects

Subjects were 92 introductory psychology students who participated to fulfill a course requirement. Eight subjects were suspicious regarding the purposes of the study and their data were dropped from all analyses. This left 84 subjects (44 men and 40 women).

Procedures

Study 3 used methods and procedures identical to those of Study 2, with the following exceptions. Self-perceptions of effort and ability were each assessed twice. Reflected appraisals of effort and ability were each assessed once. In addition, two questions assessed how much subjects liked solving anagrams.

Written Evaluation Form (Interpersonal Feedback Manipulation)

The interpersonal feedback manipulation was also different in Study 3. Interpersonal feedback was presented on a written form rather than verbally. Pretesting suggested that verbal evaluations of ability and effort generally came across awkwardly, which rendered them less credible and increased suspicion rates. The written evaluation had no such problems.

The written evaluation included two filler evaluations of “attention” and “interest” and the two manipulations—evaluations of effort and ability. Under the phrase “Your ability for solving anagrams is:” and the phrase “Your effort was:” there appeared five choices ranging from high to low. In the high ability condition *high* was circled; in the low ability condition *low* was circled; in the high effort condition *high* was circled; in the low effort condition *low* was circled. Thus, we used a 2 (ability feedback: high vs. low) \times 2 (effort feedback: high vs. low) design for this study.

Second Test

After subjects had completed the main part of the experiment (lesson, feedback, and questionnaires), they took a second anagrams test. This test consisted of 25 anagrams of intermediate difficulty. Before taking this test, subjects were told that they could work on this test for as little or as long as they liked.

Through pretesting, we developed procedures that guaranteed that nearly all subjects understood these instructions. In the debriefing, nearly all subjects indicated that they fully understood that they could stop whenever they pleased. Through pretesting, we discovered that some subjects spent an inordinate amount of time on this test. Consequently, we instituted a 40 min time limit—any subjects who continued for 40 min were informed that we needed to continue with the experiment so that they would have to stop. We did not, however, inform subjects of this limit prior to their actually taking the second test. This second test, therefore, provided two dependent measures: time spent solving anagrams when unconstrained (except for the 40 min limit) and actual performance.

Choice Questionnaire

After the second test, subjects were told that there would be one more task, on which they would have the opportunity to choose what they would do. We then gave them a Choice Questionnaire that included three questions assessing (a) how much they wished to continue solving anagrams, (b) how much they would like to solve different puzzles, and (c) whether they preferred to continue to solve anagrams or to solve different puzzles. All three questions used 9-point scales (1–9). The reliability of this scale was acceptable (.78). The questions provided an assessment of willingness to engage in the anagrams task.

Results and Discussion

ANCOVAs

A 2×2 (Effort Feedback \times Ability Feedback) ANCOVA was performed on all dependent variables. Objective performance (score on the first anagrams test) was the covariate. The Effort \times Ability interaction was not significant for any of the variables and is not discussed further. For all dependent variables, means associated with the main effects are displayed in Table 3.

Reflected appraisals. Ability feedback influenced reflected appraisals of ability, $F(1, 79) = 164.94, p < .0001$, and effort feedback influenced reflected appraisals of effort, $F(1, 79) = 139.97, p < .0001$. Objective performance significantly related to reflected appraisals of effort, $F(1, 79) = 4.55, p < .05$, and marginally related to reflected appraisals of ability $F(1, 79) = 3.10, p < .1$. There were no other significant effects on reflected appraisals.

Self-perceptions: Internalization specificity. Consistent with the internalization specificity hypothesis, ability feedback influenced self-perceptions of ability, $F(1, 79) = 24.96, p < .0001$, and effort feedback influenced self-perceptions of effort, $F(1, 79) = 17.70, p < .0001$. Also as predicted, there were no cross-over effects: Ability feedback had no significant influence on self-perceptions of effort ($F = .19$), and effort feedback had no significant influence on self-perceptions of ability ($F = 1.74$). Subjects who scored higher on the first test had higher self-perceptions of ability, $F(1, 79) = 7.57, p < .01$.

Cognitive evaluation theory. Results regarding intrinsic mo-

tivation were consistent with predictions from cognitive evaluation theory. In comparison with recipients of low ability interpersonal feedback, those receiving high ability feedback liked solving anagrams more, $F(1, 79) = 5.93, p < .02$. In addition, the pattern of means suggests that recipients of high ability feedback were more likely to wish to continue solving anagrams, $F(1, 78) = 2.49, p < .12$, solved more anagrams on the second test, $F(1, 78) = 2.18, p < .15$, and spent more time on the second test ($F < 1, ns$), although these effects did not reach statistical significance. Effects of effort feedback did not approach significance on any of the remaining dependent variables (all F 's < 1.3 ; all p 's $> .2$).

Because previous analyses had shown that high scorers had higher self-perceptions of ability, cognitive evaluation theory predicts that they should also like anagrams more. This prediction was confirmed, $F(1, 79) = 4.59, p < .04$. They also scored more highly on the second anagrams test, $F(1, 78) = 13.95, p < .001$.

Process Analysis: Causal Models

Our integration of symbolic interactionism and cognitive evaluation theory specified two stages linking feedback to intrinsic motivation: First, feedback must be internalized; second, self-perceptions (especially of ability) must influence intrinsic motivation. Cognitive evaluation theory specifies a third stage, one that links self-perceptions, intrinsic motivation, and achievement. Causal modeling, therefore, assessed each of these three stages.

We first tested a no mediation model specifying that our manipulations fully accounted for the covariances among the dependent variables (i.e., that there were no causal relations among those variables). This model failed to fit the data, $\chi^2(28, N = 83) = 133.46, p < .001$. We therefore proceeded with the first stage of causal modeling.

Symbolic interactionism: Internalization of reflected appraisals. If our interpretation of Study 2 results is correct, then Study 3 should support the internalization hypothesis of symbolic interactionism, and we should find little projection. Therefore, we next tested Study 3's version of the internalization model. This model assumed that (a) effort feedback influenced *only* reflected appraisals of effort; (b) ability feedback influenced *only* reflected appraisals of ability; (c) reflected appraisals of effort influenced *only* self-perceptions of effort; (d) reflected appraisals of ability influenced *only* self-perceptions of ability; (e) objective feedback (test score) might influence all reflected appraisals and self-perceptions; and (f) the effort feedback by ability feedback interaction, although included in this model, influenced no dependent variables. In addition, the covariance of the error terms for the two reflected appraisals was not constrained; and the covariance of the error terms for the two self-perceptions was not constrained.

Results for the internalization model are depicted in Figure 4. The model fit the data, $\chi^2(12, N = 83) = 15.48, p > .2$, GFI = .956, AGFI = .886. Path coefficients supported the symbolic interactionist predictions. The coefficient relating reflected appraisals of effort to self-perceptions of effort was significant ($B = .359, p < .01$), and the coefficient relating reflected appraisals of ability to self-perceptions of ability was significant

Table 3
Main Effect Means for Dependent Variables: Study 3

Dependent variable	Effort feedback		Ability feedback	
	Low	High	Low	High
Reflected appraisals				
Ability	4.62	4.50	2.50 _b	6.62 _b
Effort	2.45 _b	6.55 _b	4.33	4.67
Self-perceptions				
Ability	9.14	8.95	7.17 _b	10.93 _b
Effort	11.12 _b	14.45 _b	12.45	13.12
Motivation and performance				
Liking of anagrams	8.67	9.71	7.89 _b	10.52 _b
Choice of task	10.29	9.95	9.10 _a	11.12 _a
Persistence ^a	26.01	27.96	25.58	27.98
Score ^b	10.93	10.44	9.76 _a	11.60 _a

Note. Only the means associated with main effects are shown because no interactions were significant. Higher means indicate higher reflected appraisals and self-perceptions of ability and effort, more liking of the task, and higher scores on the second test. Reflected appraisals are on a 0- to 9-point scale; liking and self-perceptions are on a 0- to 18-point scale; choice of task is on a 0- to 27-point scale. Higher scores for choice of task represent more of a preference to continue working on the same task. Means with a subscript *a* are different from one another at $p < .15$. Means with a subscript *b* are different from one another at $p < .05$.

^a Persistence refers to time spent on the second test, measured in min. ^b Score refers to score on the second test.

($B = .567, p < .001$). Other effects in Figure 4 essentially repeat our ANCOVA results and are not discussed further.

We also tested two alternative models. The first assumed causal relations virtually opposite to those of the internalization model: (a) The feedback manipulations directly influenced only self-perceptions (not reflected appraisals), (b) self-perceptions influenced reflected appraisals, and (c) objective performance influenced all four variables. In addition, the covariance of the error terms for the two reflected appraisals was not

constrained, and the covariance of the error terms for the two self-perceptions was not constrained. This model failed to fit the data, $\chi^2(8, N = 83) = 151.66, p < .001$.

We also tested an internalization and projection model. This model was identical to the internalization model, with the exceptions that it also assumed that (a) self-perceptions of effort might influence reflected appraisals of effort, and (b) self-perceptions of ability might influence reflected appraisals of ability. Effort feedback was the instrumental variable for the recip-

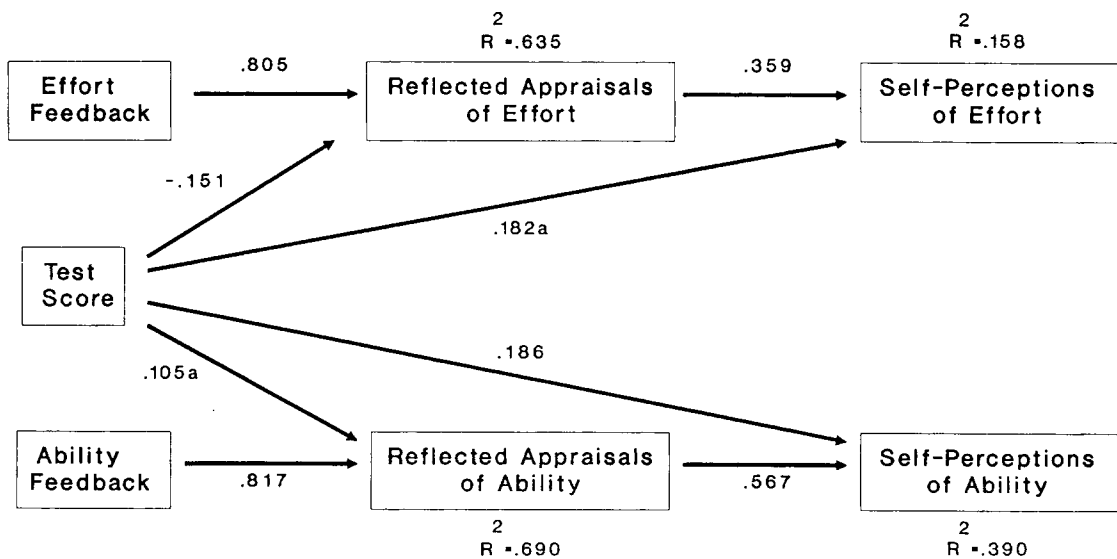


Figure 4. Internalization model: Study 3. (Reflected appraisals refer to targets' perceptions of the evaluator's view of them. All paths are significant at $p < .05$, except those with a subscript *a*, which are marginally significant at $p < .1$. All coefficients are standardized.)

rocal relations involving effort perceptions; ability feedback was the instrumental variable for the reciprocal relations involving ability perceptions.

Because this model includes two fewer restrictions than, but is otherwise identical to, the internalization model (and because the internalization model fit the data), the internalization and projection model was virtually guaranteed to fit the data, which it did, $\chi^2(10, N = 83) = 10.49$, $p > .3$. There were, however, three key questions. First, did this model fit significantly better than the internalization model (because these models are nested, they can be compared directly)? The answer was “maybe a little”—the difference in chi-squares (with $df = 2$) between the two models was 4.99, which was marginally significant ($p < .1$).

Second, did allowing for projection drastically reduce or eliminate any of the internalization effects? It did not. The path representing internalization of effort was quite similar in the two models, and the path representing internalization of ability was substantially stronger (see Figure 5).

Third, was there any evidence of projection? There was not. The path representing the influence of self-perceptions of ability on reflected appraisals of ability was small ($B = .026$) and not significant ($p > .5$). Although the path representing an influence of self-perceptions of effort on reflected appraisals of effort was significant, it was negative ($B = -.211$, $p < .05$)—in the wrong direction. This coefficient is highly anomalous. It is inconsistent with our first two experiments and with previous research (Felson, 1981, 1985, 1989; Jussim & Osgood, 1989). Therefore, we do not discuss it further.

Both the internalization model and the internalization and projection model supported symbolic interactionist predictions. Even the internalization and projection model provided

no evidence of projection. These results, therefore, were consistent with predictions based on Studies 1 and 2, suggesting that when their objective performance is intermediate, people internalize the content of the feedback they receive and do not project their self-perceptions onto reflected appraisals.

Cognitive Evaluation Theory 1: Influences on intrinsic motivation. The second stage assessed the cognitive evaluation theory hypothesis that self-perception of ability is a major influence on intrinsic motivation. The hypothesized model specified that feedback only influences intrinsic interest *indirectly*, as mediated by self-perceptions. Thus, the hypothesized model assumed that (a) effort feedback influenced only self-perceptions of effort, (b) ability feedback influenced only self-perceptions of ability, (c) objective feedback influenced both self-perceptions, (d) both self-perceptions might influence liking of anagrams, and (e) the covariance of the error terms for the two self-perceptions was left unconstrained.

This model fit the data, $\chi^2(8, N = 83) = 3.47$, $p > .9$, GFI = .988, AGFI = .967. Path coefficients supported cognitive evaluation theory (see Figure 6). Although the relation of self-perceptions of effort to liking of anagrams was significant ($B = .226$, $p < .05$), it was much smaller than the coefficient relating self-perceptions of ability to liking ($B = .604$, $p < .001$).

Two additional alternative models were assessed. The first was identical to the hypothesized model but also allowed both feedback manipulations and objective performance to directly influence liking for anagrams. None of the three path coefficients relating interpersonal and objective feedback to liking were even marginally significant.

The second alternative reversed the mediational process. It assumed that interpersonal feedback only influences liking of anagrams, which then influences self-perceptions. This model

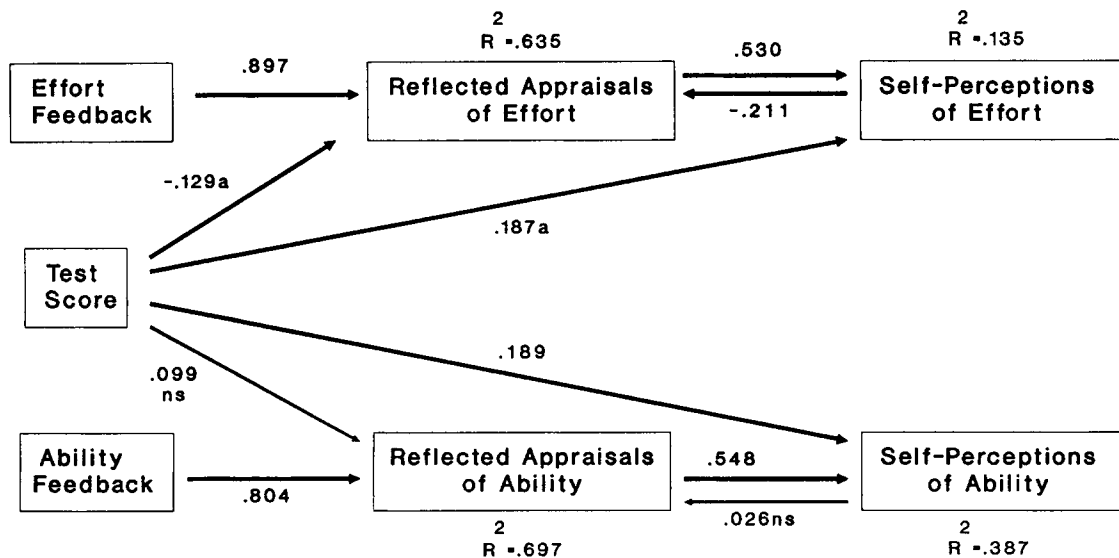


Figure 5. Internalization and “projection” model: Study 3. (Reflected appraisals refer to targets’ perceptions of the evaluator’s view of them. Nonsignificant paths are indicated by ns and by noticeably thinner arrows. Paths with a subscript a are marginally significant at $p < .1$. All other paths are significant at $p < .05$. All coefficients are standardized. “Projection” is in quotes because this model provides no evidence of projection [see text]).

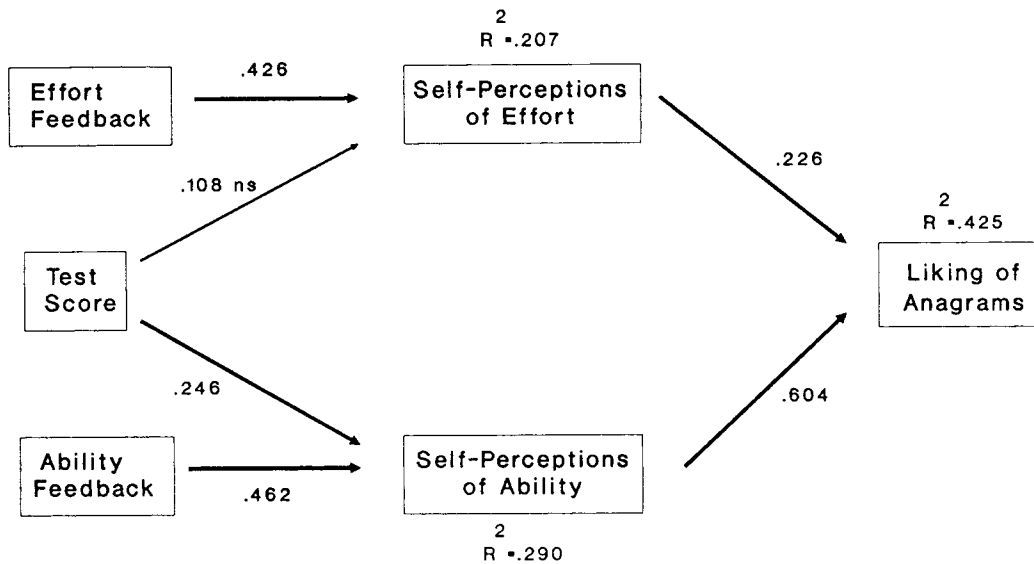


Figure 6. Influences on intrinsic motivation: Study 3. (Nonsignificant path is indicated by *ns* and by a noticeably thinner arrow. All other paths are significant at $p < .05$. All coefficients are standardized.)

also allowed objective feedback to influence all three dependent variables. However, it did not account for the data, $\chi^2(7, N = 83) = 35.43, p < .001$.

These analyses supported the cognitive evaluation theory contention that self-perceptions mediate effects of feedback on intrinsic motivation. In the model shown in Figure 6, paths linking feedback to self-perceptions, and self-perceptions to intrinsic motivation, were all significant, as predicted by the theory. Results showing that self-perceptions of ability related much more strongly to intrinsic motivation also supported the theory.

Cognitive Evaluation Theory 2: Motivation and performance. The third stage of modeling assessed the role of intrinsic motivation in subsequent achievement and related behaviors. The correlations of self-perceptions of ability with task choice, $r(83) = .34, p < .001$, and score on the second test were significant, $r(83) = .35, p < .001$, as was the correlation of self-perceptions of effort and time spent on the second test, $r(83) = .19, p < .05$. The other correlations among self-perceptions and performance-related behaviors were not significant. Cognitive evaluation theory, however, suggests that self-perceptions influence performance only indirectly, by virtue of their relation to intrinsic motivation (Deci & Ryan, 1980; Harackiewicz & Larson, 1986; Harackiewicz et al., 1985; Sansone, 1986, 1989; Sansone et al., 1989). In this stage, therefore, our hypothesized model assumed that liking of anagrams mediated any effects of self-perceptions on performance and related behaviors.

This model assumed that (a) self-perceptions of ability and effort directly influenced *only* liking of anagrams, (b) liking might influence choice of tasks, persistence, and score, (c) persistence could influence score on the second test, (d) score on the first test directly influenced *only* score on the second test, and (e) the covariance of errors for performance and task choice was left unconstrained. This model fit the data, $\chi^2(10, N = 83) = 9.79, p > .4, GFI = .968, AGFI = .925$. Figure 7 presents the

results. Effects for self-perceptions are virtually identical to those in Figure 6. In addition, liking of anagrams significantly related to time spent on the second test ($B = .219, p < .05$), choice of task ($B = .553, p < .0001$), and score on the second test ($B = .284, p < .01$). Score on the first test also significantly related to score on the second test ($B = .281, p < .01$).

The nature of our experimental procedures allowed us to rule out several alternative causal relations. The variables used in this study were assessed in several stages. First, subjects took the test and received objective feedback and interpersonal feedback. Second, they responded to a questionnaire assessing their reflected appraisals and self-perceptions of effort and ability, and of how much they liked the task. Third, they took a second anagrams test. Fourth, they responded to the Choice Questionnaire. This time lag between dependent variables allowed us to rule out at least one set of alternative explanations for relations among them—events at a subsequent time did not cause events at a previous time. For example, their choice of task did not influence (our assessment of) their liking for the task. These procedures allowed us to conclusively eliminate all models assuming that time spent on the second test, choice of task, or performance influenced our assessment of either intrinsic motivation or self-perceptions.

We did, however, test an alternative model that was identical to Figure 7, except that it allowed self-perceptions and score on the first test to predict all four of the remaining variables. In this model, however, none of the path coefficients other than those shown in Figure 7 were significant.

Stage 3 analyses, therefore, were consistent with two main predictions of cognitive evaluation theory. These predictions were that (a) intrinsic motivation mediates influences of self-perceptions on achievement-related behaviors; and (b) liking for anagrams directly influences persistence, task choice, and performance. Numerous alternative models were ruled out, again providing as clear a confirmation of cognitive evaluation

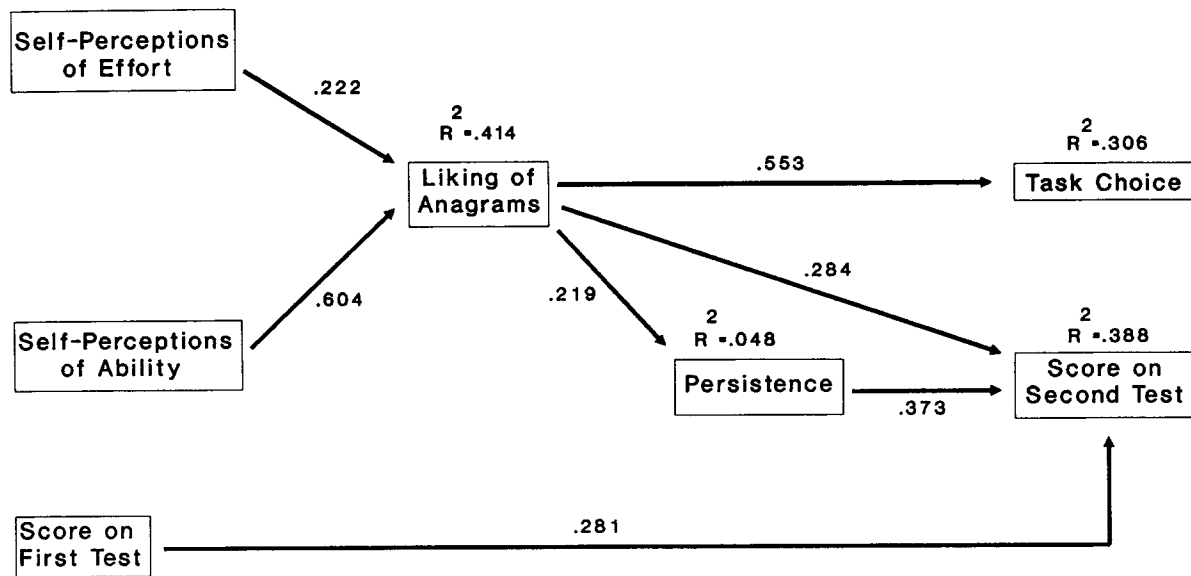


Figure 7. Self-perceptions, intrinsic motivation, and behavior: Study 3. (All coefficients are standardized and are significant at $p < .05$. Persistence refers to time spent on the second test.)

theory predictions as causal modeling techniques are capable of providing.

General Discussion

These three studies addressed questions regarding relations among feedback, self-perceptions, motivation, and performance by integrating a subset of the ideas of two broad and rich theoretical perspectives: symbolic interactionism and cognitive evaluation theory. The results obtained in the three studies supported our integration of the theories. They also provided insights into the conditions under which symbolic interactionism best explains reactions to feedback and into the processes by which feedback influences motivation.

A Simple Integrative Perspective

Our proposed integration was quite simple: Interpersonal feedback enhances intrinsic motivation only when reflected appraisals (especially regarding ability) are internalized. ANCOVA results from Study 3 supported this perspective by showing that ability feedback and objective feedback both influenced self-perceptions of ability and both influenced intrinsic motivation. Effort feedback, which was unrelated to self-perceptions of ability, had no effect on intrinsic motivation. Causal modeling in Study 3 also supported this integration. Results were consistent with the assumption that interpersonal feedback had no influence on intrinsic motivation, except as mediated by self-perceptions (especially self-perceptions of ability).

However, we are not claiming that *all* types of feedback must influence intrinsic motivation through a process of internalization of reflected appraisals. The ANOVAs and ANCOVAs in all three studies showed that objective performance influenced

self-perceptions of ability, and causal modeling results showed that at least part of this influence was not mediated by reflected appraisals. Presumably, people construe objective performance as diagnostic of performance and ability, so that it has some influence on self-perceptions that is not mediated by reflected appraisals. We strongly suspect that other types of feedback, such as normative feedback or social comparison information (“You scored in the top 10%”), would be similarly construed by most people as providing objective diagnostic information regarding performance and ability.

Limitations

Theoretical Limitations

Our perspective is not intended to integrate and capture the wealth of ideas generated by research within either the symbolic interactionist or cognitive evaluation theory perspectives. We have drawn on these theories because they generate clear predictions regarding how and when feedback should influence self-perceptions and motivation. Our integration does not explicitly address social roles, social and personality development, or the numerous ways people may “take the role of the other” without internalizing reflected appraisals (e.g., Cooley, 1902; Mead, 1934; Stryker & Statham, 1985). However, the internalization of reflected appraisal hypothesis is *one* idea generated by the symbolic interactionist perspective, and our operational tests of this hypothesis are consistent with a great deal of past research (e.g., Felson, 1981, 1985, 1989; Shrauger & Schoeneman, 1979).

Similarly, our perspective does not encompass issues of autonomy, self-determination, or personality integration addressed by cognitive evaluation theory (Deci & Ryan, 1980, 1990). Recent theoretical statements of cognitive evaluation

theory have focused more on autonomy than on self-perceptions of competence (Deci & Ryan, 1987, 1990). Furthermore, cognitive evaluation theory proponents might even condemn our entire set of procedures as likely to *undermine* intrinsic motivation because they emphasize competition, performance standards, and external evaluations.

Despite these issues, we believe that cognitive evaluation theory provides *one* useful approach to understanding reactions to feedback. Vividly clear hypotheses regarding relations between feedback and self-perceptions of competence and between self-perceptions of competence and intrinsic motivation appear throughout the early statements of the theory: "Intrinsic motivation will be affected if there is a change in one's perceptions of being competent" (Deci & Ryan, 1980, p. 61) and "*positive competence feedback should always increase intrinsic motivation*" (Deci & Ryan, 1980, p. 63, emphasis in original).

Study 3 provided a clear and simple operationalization of these ideas. Furthermore, because the competitive and evaluative aspects of Study 3 were constant across conditions, they do not undermine the appropriateness of our test of cognitive evaluation theory hypotheses regarding reactions to feedback.

Precisely because cognitive evaluation theory suggests that so many factors undermine intrinsic motivation, some researchers have gone so far as to suggest that the theory is virtually bankrupt:

If intrinsic motivation is largely wiped out . . . by such factors as salient incentives and rewards; competition; imposed goals, standards and deadlines; pressure; anxiety; self-doubt; conflict; instrumental task consequences; feelings of obligation to others; appraisals of performance by others; negative feedback; surveillance; ego-involvement, and the like, then it is doubtful that it has much application to real life (Locke & Latham, 1990, p. 56)

Cognitive evaluation theorists have indeed suggested that each of the factors listed by Locke and Latham (1990) undermines intrinsic motivation (e.g., Deci & Ryan, 1980, 1985, 1990; Harackiewicz & Larson, 1986; Harackiewicz et al., 1985; Koestner et al., 1987; Sansone, 1986, 1989; Sansone et al., 1989). Furthermore, we agree with Locke and Latham that situations in which people receive rewards, are evaluated by others, compete with others, are under some external pressure to perform, and so on are the norm rather than the exception. This is one of the reasons we intentionally created a social situation in our laboratory that included many of these features. Nonetheless, we disagree with Locke and Latham's pessimistic conclusion regarding the viability of cognitive evaluation theory. This is because we conceptualize intrinsic motivation as a quantitative, rather than a qualitative, phenomena—in any given context, people may be more or less intrinsically motivated. Jobs, classrooms, baseball and football fields, boot camps, video halls, and so on are all contexts in which competition, feedback, rewards, and evaluations exist. Nonetheless, many people seem to enjoy these activities a great deal, despite the existence of so many factors believed to undermine intrinsic motivation. If competition is a constant across a context (e.g., all athletes playing on a football team find themselves in essentially the same competitive context), then one would look for other factors proposed by the theory as influences on intrinsic motivation (e.g., receipt of positive or negative competence feedback from their

coach). In this way, we believe that ideas from cognitive evaluation theory may be fruitfully applied to understanding influences on intrinsic motivation, even in the many realistic and common contexts that include rewards, pressures, evaluations, standards, and so on.

Demand Characteristics

Perhaps, however, rather than reflecting true effects, the pattern of results for interpersonal feedback simply reflects demand characteristics—evaluators provided targets with feedback, and targets just responded how they thought that they "should." Several factors, however, argue against a demand interpretation. First, the informed consent procedure emphasized to targets that their questionnaire responses would be anonymous and confidential. Second, in contrast to the studies Shrauger and Schoeneman (1979) appropriately criticized for having subjects complete questionnaires in the presence of the experimenter or the evaluator, our studies had targets respond to questionnaires in complete privacy—alone in a small room. Third, a demand characteristics explanation requires subjects to have made reasonable guesses regarding the hypotheses. In our debriefing, we asked subjects to describe the purpose of the study *and* to indicate whether they felt deceived. Across the three studies, less than 10% of all subjects' responses indicated *either* that they had figured out the purposes of the study or that they felt deceived.

Fourth, evidence against a demand characteristics explanation was provided by results showing that the typical subject averaged spending *over 26 min* on the second anagrams test, despite understanding that they were free to work for as short (or as long) as they liked. It seems extremely unlikely that subjects would invest almost a half an hour of their personal time just to please the experimenters.

Fifth, a demand characteristics explanation provides no basis for predicting or assuming that only feedback relevant to competence would influence intrinsic motivation. It also provides no basis for predicting that ability feedback and objective performance, but not effort feedback, would influence liking for anagrams. Without highly expert knowledge regarding cognitive evaluation theory, one cannot account for results showing that models assuming self-perceptions influence liking fit the data, but models assuming liking influences self-perceptions do not. One similarly cannot account for the support obtained for models assuming self-perceptions influence task choice, persistence, and performance *only* by virtue of the mediation of intrinsic motivation and for the inability of alternative conceptualizations to account for the data.

Disadvantages of Causal Modeling

Causal modeling of correlational data does not provide as clear evidence regarding causal relations as does a typical experiment (Kenny, 1979). The most that one can conclude on the basis of causal modeling is (a) a theoretically based model is (or is not) capable of accounting for the data, and (b) plausible alternative models are (or are not) capable of accounting for the data. We have, however, tested numerous alternative models

and found all but those shown in Figures 2 through 7 lacking. Indeed, we have identified, tested, and ruled out more alternative models than have all other studies we know of that have investigated feedback or symbolic interactionism through the use of causal modeling techniques (e.g., Felson, 1981, 1985, 1989; Graham, 1984; Harackiewicz et al., 1985, 1987; Harackiewicz & Larson, 1986; Sansone, 1986, 1989; Sansone et al., 1989; Schafer & Keith, 1985). If there are alternative models more empirically and theoretically viable than those depicted in Figures 2 through 7, it will be the challenge of future research to discover them.

Advantages of Causal Modeling

Despite these limitations, we believe that there are some unique advantages to our synthesis of experimental methodology and causal modeling techniques.

Mediation by Manipulation Check

Our use of causal modeling allowed us to explicitly test the assumption that all effects of an experimental manipulation were mediated by a manipulation check. Most experiments typically show that (a) the manipulations influenced the manipulation check, and (b) the manipulations influenced the dependent variables. This provides no direct evidence that whatever was assessed by the manipulation check (which presumably captures the essence of the manipulation) has any relation whatsoever to the dependent variables (except by virtue of both the manipulation check's and the dependent variables' spurious relations to the manipulation). Testing this assumption is important. If the manipulations directly influence the dependent variables even after controlling for the manipulation check, there is something fundamentally wrong with the experiment. Such results may mean that the manipulation influences the dependent variables for reasons *other* than those captured in the manipulation check. The practice of assessing mediation by the manipulation check is something that could be adopted in many research settings.

Is Causal Modeling the Only Way to Directly Test the Internalization Hypothesis of the Symbolic Interaction Perspective?

We believe that it is. The symbolic interactionist perspective specifies a two stage process of influence of others' evaluations on the self: (a) feedback influences reflected appraisals, and (b) reflected appraisals influence self-perceptions. By definition, both reflected appraisals and self-evaluations are intrapsychic phenomena—they occur inside subjects' heads. It is impossible to manipulate them directly; one can only manipulate external factors that one hopes will influence them. Causal modeling, therefore, appears to be the only viable technique for assessing whether feedback influences self-perceptions through a process of internalizing reflected appraisals. We believe that one of the main contributions of this research is that it has provided one of the clearest tests to date of one of the major hypotheses generated by the symbolic interactionist perspective.

Is Causal Modeling the Only Way to Test Cognitive Evaluation Theory Predictions?

No. A host of experimental studies have addressed various aspects of cognitive evaluation theory. However, several cognitive evaluation theory predictions specify mediational stages. Feedback is hypothesized to influence intrinsic motivation indirectly, as mediated by self-perceptions, especially self-perceptions of ability. Influences of self-perceptions on task choice, persistence, and performance are hypothesized to be largely mediated by intrinsic motivation.

Causal modeling may not provide the only way to test each of these individual steps. We suggest, however, that it does provide the only way to assess more than one step at a time within a single study. We further suggest that experimental research assessing one step at a time (such as showing that intrinsic motivation influences persistence) is limited by never being able to demonstrate that the entire sequence occurs as specified by the theory. Similarly, experimental research that skips a step or two, for example, by showing that feedback influences persistence, is incapable of demonstrating that such influence is mediated by intrinsic motivation. Only by assessing more than one step at a time can one discover whether feedback, self-perceptions, intrinsic motivation, and performance-related behaviors relate to one another as specified by the theory. Locke and Latham (1990), too, have noted the failure of previous research from a cognitive evaluation theory perspective to explicitly measure hypothesized mediators and assess their relations to independent and dependent variables. They believe that this is a serious problem for the theory.

One of the major contributions of Study 3, therefore, was to begin redressing this serious problem. Study 3 used one of the best, if not the only, way we know of to assess multiple steps in a causal chain—through the use of causal modeling techniques. Study 3 may be considered a replication of previous research because it has documented each of the individual steps. In addition, however, Study 3 is unique because it has provided the first confirmation of the full set of links specified by the theory regarding relations among feedback, self-perceptions, intrinsic motivation, and performance-related behaviors.

Conclusion

Symbolic Interactionism

A central tenet of the symbolic interactionist perspective is that people see themselves through the eyes of others. However, it is not always easy to know what others think of one's self; indeed, naturalistic research suggests that this may often be quite difficult (Felson, 1981, 1985, 1989). An absence of such knowledge may contribute to some of the difficulties previous research has had in finding support for the symbolic interactionist perspective (Shrauger & Schoeneman, 1979).

Therefore, it may be that *when* people take the role of the other, interpersonal evaluations influence the self in exactly the manner specified by symbolic interactionism. Another contribution of our research may be that it has shed some light on conditions that facilitate taking the role of the other. People can safely and reasonably assume that others view their achievements especially favorably or unfavorably when (a) their objec-

tive performances are clearly high or low or (b) those others explicitly tell them their performances were high or low. In contrast, it must be quite difficult to take the role of the other when one is not sure how that other views one's self. Our research suggests that when their objective achievements are intermediate or ambiguous and when no explicit evaluation is provided, it may be much more difficult for people to know how others view them.

Taking the role of the other has generally been assumed by symbolic interactionists to be a ubiquitous phenomena, inherent in the very fabric of social relations. Alternatively, it can be viewed as an individual difference variable, with some types of people more (or less) concerned with how others view them (Snyder, 1974). The current studies raise a third possibility: Taking the role of the other may be at least partially situationally determined. When there is sufficient information in social interactions to allow people to know how others view them, their self-perceptions may indeed be shaped by those interactions. Often, however, there may be insufficient information to know how others view one's self, rendering it more difficult to take the role of the other. In such situations, rather than internalizing reflected appraisals, people assume others see them much as they see themselves (Study 2; Felson, 1981, 1985). When there is little clear information to go on, it seems reasonable to "guesstimate" that others view one much as one views oneself. This type of situational approach to the looking-glass self may prove a fruitful area for future research.

Our studies also highlight the importance of testing for projection effects when interpreting correlations between self-perceptions and reflected appraisals. When objective feedback was intermediate we found evidence of projection (Study 2). Self-perceptions of ability and effort strongly influenced reflected appraisals of ability and effort. Previous research that has failed to rule out projection may have reached inappropriate conclusions regarding the influence of reflected appraisals on self-evaluations (contrast, e.g., studies by Graham, 1984, and Schafer & Keith, 1985, which did not control for projection, with Felson, 1985, Jussim & Osgood, 1989, and the current studies, which did).

Cognitive Evaluation Theory, Feedback, and Self-Fulfilling Prophecies

The support for cognitive evaluation theory predictions provided in our third study suggests that interpersonal feedback regarding ability may become a self-fulfilling prophecy (Rosenthal & Jacobson, 1968; Jussim, 1986). Ability evaluations may influence intrinsic motivation, which influences persistence of both effort on a task and interest in pursuing a task. If these processes occurred over a longer period, it seems likely that changes in persistence would influence both the ability and the performance of the target. Thus, an originally false evaluation of ability may eventually become self-fulfilling. The role of ability evaluations in explaining self-fulfilling prophecies may be another interesting area for future research.

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