The Influence of Cognitive and Affective Reactions to Feedback on Subsequent Goals

Role of Behavioral Inhibition/Activation

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Abstract. This paper focuses on explaining how individuals set goals on multiple performance episodes, in the context of performance feedback comparing their performance on each episode with their respective goal. The proposed model was tested through a longitudinal study of 493 university students' actual goals and performance on business school exams. Results of a structural equation model supported the proposed conceptual model in which self-efficacy and emotional reactions to feedback mediate the relationship between feedback and subsequent goals. In addition, as expected, participants' standing on a dispositional measure of behavioral inhibition influenced the strength of their emotional reactions to negative feedback.

Keywords: feedback, emotions, self-efficacy, goal setting

The process of setting personal goals or standards is central to models explaining motivated behavior. One of the more robust findings in organizational behavior is that the setting of specific, difficult goals leads to higher levels of individual and group performance compared to setting no goals, or vague or easy goals (e.g., Latham & Locke, 2007; Locke, 1997; Locke & Latham, 1990). Theoretically and practically, personal goals are important for self-regulatory motivation (Latham & Locke, 1991) because individuals use goals to regulate their behavior and effort (Button, Mathieu, & Aikin, 1996; Donovan & Williams, 2003). To regulate their behavior by adjusting their goals, individuals need feedback so that they can assess their previous performance relative to their goals. That is, individuals use information about the discrepancy between their performance and goals to evaluate the effectiveness of their behavior and to form subsequent goals (Donovan & Williams, 2003; Phillips, Hollenbeck, & Ilgen, 1996; Vance & Colella, 1990).

In this paper, we follow this self-regulatory perspective on motivation by proposing that both cognitive and emotional reactions to performance feedback explain goal setting. Further, we contend that individual differences in reactions to feedback exist and these differences can be predicted with dispositional constructs. To build a model of goal setting specifying how individuals process feedback information in order to set future goals, and to identify individual differences in the characteristic processing of feedback information, we started from the cognitive-affective personality system (CAPS) proposed by Mischel and Shoda (1998).

In their conceptual model, Mischel and Shoda (1998) explained individuals' contextually sensitive processing through a mediating system of cognitive-affective units including encodings, expectancies and beliefs, emotional and affective responses, goals and values, and self-regulatory competencies and plans. Furthermore, these authors conceptualized individual differences in processing dynamics as reflective of different chronic accessibilities or activation levels of the cognitive-affective units (e.g., different emotional response tendencies) as well as distinctive patterns of relationships among the cognitive-affective units across individuals.

Applications of the broad integrative model proposed by Mischel and Shoda (1998) have been proposed in the areas of information processing and social cognitive theories of behavior. With respect to behavioral personality traits, Wood and Beckmann (2006) suggested that trait measures (sub-factors of the Five Factor Model, specifically) "tap relative consistencies in an individual's cognitive and affective reactions and behaviours across a range of situations" (p. 463). Although a complete description of individual differences in patterns of self-regulation is beyond the scope of this article, following Mischel and Shoda (1998), we propose a conceptual model explaining goal setting in repeated-task settings by examining cognitive and affective units (e.g., self-efficacy and emotional reactions to feedback). This model is presented in Figure 1. In addition, we examine individual differences in emotional reactions to feedback information, which is consistent with Mischel and Shoda (1998), and

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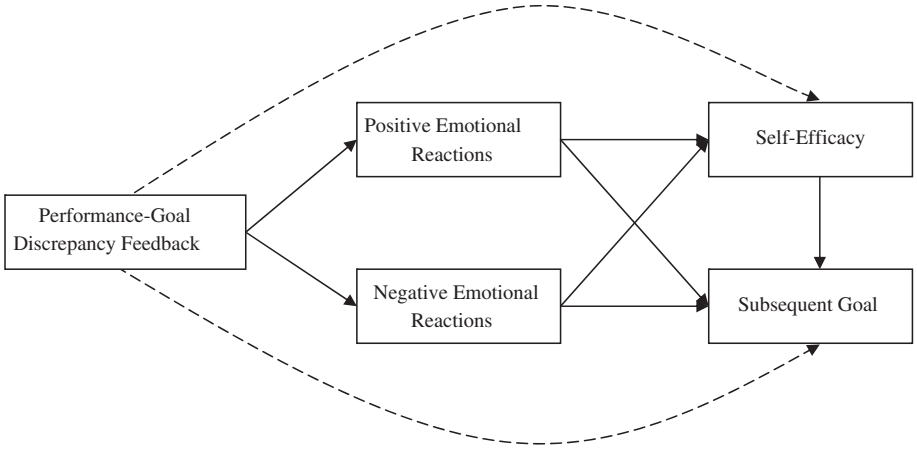


Figure 1. Conceptual model of goal setting.

Note. Model 1 consists of the relationships illustrated with solid lines; Model 2 includes relationships symbolized with both solid and dashed lines.

Wood and Beckmann (2006). Below, we present conceptual arguments supporting the causal links proposed in the model and review previous research suggesting support for these links.

Feedback and Goal Setting

Behavioral regulation is guided by a feedback-comparison-reaction mechanism that specifies that people are motivated to align their performance with their standards and they attempt to do so by striving to reduce or eliminate any discrepancy between performance and standards (e.g., Kluger & DeNisi, 1996). That is, individuals evaluate the discrepancy between their performance and their goals to guide their future goals, behavior, and effort. When such discrepancy is negative (performance falls short of the goal), individuals can reduce the discrepancy by trying to increase performance or by revising their goals (Kluger & DeNisi, 1996). Across a range of negative feedback values, the larger the negative performance-goal discrepancy, the more likely are individuals to adjust their goals downward (Donovan & Williams, 2003; Williams, Donovan, & Dodge, 2000).

With respect to positive performance-goal discrepancies, social cognitive theory (Bandura, 1997) specifies that individuals are motivated to achieve goals, rather than reduce discrepancies. That is, after receiving feedback indicating that they have met or exceeded their goal (i.e., positive performance-goal discrepancy), individuals further increase their goals (they set goals higher than past performance; Phillips et al., 1996) to motivate their behavior and further increase performance. Indeed, previous research on discrepancy feedback has found that the size of the positive discrepancy is positively related to subsequent goals (Donovan & Williams, 2003; Phillips et al., 1996; Williams et al., 2000).

In sum, for negative performance-goal discrepancies, we expect that the actual value of the discrepancy would be positively related to subsequent goals (lower negative discrepancy values reflect discrepancies of higher magnitudes and they should lead to lower subsequent goals). For positive discrepancies, we expect that the size of the positive discrepancy feedback would positively predict future goals. Together, these expectations amount to predicting that the value of the discrepancy feedback positively predicts subsequent goals regardless of the sign of the discrepancy. Previous research has supported such relationships between discrepancy feedback and goals. Vance and Colella (1990, p. 75), for example, noted that "it appears that subjects sought to further enhance performance by increasing personal goals on receipt of positive feedback, whereas they responded to negative feedback by setting lower, more realistic personal goals."

The Mediating Role of Self-Efficacy

Social cognitive theory (Bandura, 1997) proposes that self-regulatory motivation works through people's beliefs in their personal efficacy. Perceived self-efficacy concerns individuals' judgments of their capabilities to mobilize motivational and cognitive resources and to formulate task strategies such as to exercise control over actions needed to perform a specific task. Strong positive self-efficacy beliefs lead to high performance because they increase individuals' motivation as reflected in how much effort they will exert on the task and how long they will persevere (e.g., Bandura & Cervone, 1983; Wood & Bandura, 1989). Self-efficacy also influences performance indirectly, through its effect on personal goals (e.g., Locke, 1997). Individuals who have greater confidence in their capability to perform a specific task will naturally set higher goals for their performance on the task than those who lack such self-confidence (e.g., Button et al., 1996).

Although between-individual differences in stable self-efficacy beliefs are important because these differences are associated with resiliency and persistence (see Bandura, 1997), in a repeated-task framework self-efficacy beliefs can be influenced, to some extent, by performance feedback

(see Bandura & Locke, 2003, for multiple examples). Furthermore, because the motivational effects of self-efficacy are thought to be realized, in part, through self-set goals (see Bandura & Locke, 2003; Locke, 1997), individuals' beliefs regarding their capability to perform well on the subsequent performance episode should mediate the relationship between performance-goal discrepancy feedback (PGDF) and subsequent goals such that those receiving more positive performance feedback (relative to their goal) will have increased self-efficacy (compared to those receiving less positive feedback) which, in turn, will lead to higher goals for their subsequent performance.

The Mediating Role of Emotional Reactions

Another mechanism that should explain the relationship between feedback and subsequent goal setting relates to individuals' emotional or affective reactions to the feedback. Cognitive constructs such as self-efficacy beliefs have been an integrative part of self-regulatory motivation theory (Bandura, 1997), and although Weiner (1985) suggested the importance of emotion in motivational processes, only recently have scholars investigating self-regulation and human motivation begun to systematically integrate affective influences into their models of motivation. These advances have included work that integrates cognition and emotion into models of self-regulation explaining how individuals regulate their behaviors (cf. Schutz & Lanehart, 2002). In this paper we contribute to this growing understanding by presenting an integrative model which illustrates how discrepancies between goals and performance influence both cognitive and affective states, and how these states influence subsequent performance goals.

This addition is necessary because, as noted by Kluger and DeNisi (1996) in their review on the effect of feedback interventions on performance, the classic feedback-standard comparison argument is inadequate for explaining the effect of feedback on performance, in part because it ignores feedback-induced affect and its effects on future performance. With respect to goal setting, Brockner and Higgins (2001, p. 47) noted that "emotional consequences of goal attainment/nonattainment" are an aspect of goal-setting theory that has been neglected. Only very recently has empirical work begun to explicitly investigate the mediating role of emotional states in the goal regulation process (Ilies & Judge, 2005). In this paper, we attempt to build upon this recent research by proposing and testing a model of goal setting that considers both cognitive and affective explanatory mechanisms.

A basic psychological explanation of motivational self-regulation across multiple performance episodes can be developed from Gray's (1990) Reinforcement Sensitivity Theory (RST) which specifies that two behavioral motivation systems – the behavioral approach system (BAS) and the behavioral inhibition system (BIS) – help individuals interpret environmental stimuli and motivate and reinforce their behavior in response to the stimuli. In short, RST specifies that the BAS is activated by reward stimuli. Its activation stimulates appetitive motivation due to the positive emotions generated by the potential rewards. In contrast, the BIS regulates aversive motivation and avoidance behaviors through the experience of negative emotions associated with punishment stimuli. With respect to performance-goal feedback, positive discrepancy feedback is certainly a rewarding event, and thus it should activate the BAS and stimulate positive emotions which, in turn, should lead to increased goals (appetitive motivation). Negative feedback should activate the BIS and stimulate negative emotions which would lead to decreased goals (aversive motivation).

Although they did not examine the effects of discrepancy feedback, Ilies and Judge (2005) investigated the mediating role of affective states in explaining the effects of previous performance on future goals in a multitrial experiment. This study revealed that affect indeed mediated the effects of previous performance (the feedback indicating previous performance was either real or manipulated) on subsequent goals. Furthermore, there is empirical evidence supporting the feedback-emotions and emotions-goals links. For example, previous research suggests that positive feedback elicits positive mood and satisfaction whereas negative feedback leads to the experience of negative moods and feelings of dissatisfaction (e.g., Kluger, Lewinsohn, & Aiello, 1994), which suggests that discrepancy feedback should have a similar effect on emotions and affective states. With respect to the connection between emotions and goals, the fact that neuroticism negatively predicts and extraversion positively predicts goal-setting motivation (Judge & Ilies, 2002), coupled with the association of these two traits with negative and positive emotions (Watson, 2000), respectively, suggests that positive emotions have a positive effect on goals and negative emotions negatively predict goals.

In sum, given the conceptual explanation of motivational self-regulation based on RST and the suggestive empirical evidence reported in the literature, we expect that individuals' emotional reactions to PGDF will mediate the relationship between feedback and goals such that those receiving more positive performance feedback (relative to their goal) will have more positive emotional reactions (compared to those receiving less positive feedback) which, in turn, will lead to higher goals for the subsequent performance episode.

Thus far, we have proposed that both cognitive (self-efficacy beliefs) and affective (emotional reactions to feedback) mechanisms explain, or mediate, the effect of feedback on subsequent goals. But how do these cognitive and affective processes work in tandem? Mood congruency theory (Bower, 1981) suggests that emotions impose an organizational structure on concepts in memory and stimulate similarly valenced memories and cognitions, thereby influencing cognition. This suggests that following instances of negative feedback and subsequent negative emotional reactions, an individual's memory will be primed to recall other instances of failure or negative feedback or to experience negative emotional reactions. As the memory is primed with these negative cues we would expect the individual to experience reduced task-based self-efficacy, therefore leading to lower goals. Similarly, following the experience of

positive emotions, mood-congruency theory suggests that memories related to similarly positive emotions will be activated, and to the extent to which these positive memories are associated with times of success and high self-efficacy, we would expect the individual to set higher subsequent goals than they would in the absence of this affect-induced prime. Therefore, based on mood-congruency theory, and on evidence of an influence of affect on self-efficacy beliefs (e.g., Baron, 1990), we expect emotional reactions to affect goals, in part, by inducing increased self-efficacy which in turn leads to higher goals (i.e., self-efficacy partially mediates the relationship between emotional reactions and subsequent goals).

Our foregoing discussion may suggest that we see self-efficacy as entirely situational and therefore fragile, which would be inconsistent with the view that stable individual differences in self-efficacy exist and the empirical evidence supporting this view (see Judge, Jackson, Shaw, Scott, & Rich, 2007). However, Bandura's (1997) theory allows for some degree of malleability with respect to individuals' self-efficacy beliefs (in fact, Bandura disagrees with the importance of traits in self-efficacy research), and one of the determinants of self-efficacy is previous performance (this falls under Bandura's, 1997, category of "enactive mastery," which he argues is the most important source of self-efficacy). In sum, we believe that individual differences in self-efficacy are important because they are associated with differences in resiliency and persistence (as already noted), but we also believe that task self-efficacy is, to some degree, changeable. Thus, our approach might be seen as a middle ground between the purely situational and purely trait perspectives.

Dispositional Moderating Effects

As noted in the introduction, an important goal of this study was to examine individual differences in the ways in which people process feedback information. Dispositional characteristics reflecting such individual differences should predict the magnitude of individuals' emotional reactions to feedback. The RST framework on which we based our mediated model of goal setting suggests that individuals have differing chronic sensitivities to punishment and reward that predict their typical response patterns to such stimuli (Gray, 1990; see also Watson, 2000). Therefore, according to RST, individuals have different sensitivities to negative and positive feedback, which should be reflected in differential reactions to such feedback.

Seeking support of the moderating effects suggested by the RST, Larsen and Ketelaar (1989) conducted an experimental study designed to test the moderating effects of neuroticism and extraversion – traits thought to reflect individuals' sensitivities to punishment and reward, respectively – on individuals' susceptibility to mood inductions. These researchers induced pleasant and unpleasant moods using manipulated feedback indicating success or failure, and they found that extraversion predicted increases in respondents' positive affect following positive feedback, and that neuroticism predicted increases in negative affect scores after negative feedback. This evidence offers indirect support for our contention that individuals' chronic BIS/BAS activation has a moderating role in the process leading from feedback to affect to subsequent goals.

In the study presented here, we examine the moderating role of individuals' sensitivity to rewards and punishments by assessing behavioral activation directly, using Carver and White's (1994) BIS/BAS scales. We expect that individuals' chronic BIS/BAS activation will moderate their emotional reactions to negative/positive feedback such as those who have more active BIS/BAS systems will react to negative/positive feedback more strongly than those with less active BIS/BAS systems.

To test the model proposed herein, we conducted a study designed to simultaneously examine the role of emotional reactions and self-efficacy in mediating the effect of PGDF on subsequent goals, and to examine the moderating effects discussed above. This study was conducted over the course of a semester, and involved undergraduate students who were asked to set goals for each of four exams, to report their emotional reactions to feedback which was provided after each exam, and to report their self-efficacy beliefs for their performance on the subsequent exam. Conceptually, we chose to focus on performance-goal discrepancies primarily because evaluating performance against goals is central to social cognitive theory (Phillips et al., 1996). That is, individuals evaluate their performance against their goals and then use the evaluative information to regulate their behavior. Following this self-regulation principle we specifically asked respondents to report their emotional reactions to their performance relative to their previous goal.

Method

Participants

Four hundred ninety-three undergraduate students from a large introductory class at a large public university participated in this study. Participation was voluntary and was rewarded with course extra credit. Fifty-five percent of the participants were women; the average age of the participants was 20.7 years.

Procedure

The study had two phases. In the first phase, which took place at the beginning of the semester, respondents completed a dispositional survey. The class involved three mid-term exams and a final exam; for the second phase of the study, before each exam, participants were asked to set a goal for their performance on that exam, in terms of the number of questions answered correctly (all exams had 50 questions). Exam grades were posted on the course Web page. After checking their grade, respondents were shown their initial goal for the exam, and then were asked to

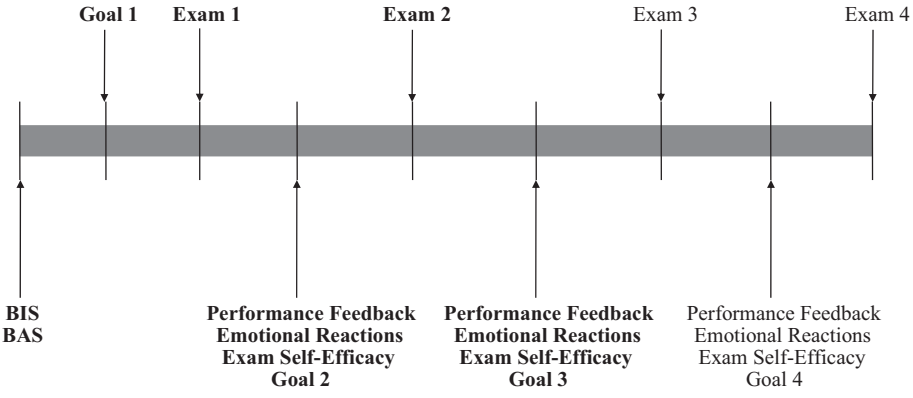


Figure 2. Temporal ordering of measures.

Measures used in the analyses are presented in bold.
Exam 4 was optional and thus measures related to the final exam were subject to self-selection bias.
These measures were therefore not used in the analyses.

compare their actual performance to their goal and to report their emotional reactions to the discrepancy. After reporting their emotional reactions to the performance feedback, respondents were asked to report their self-efficacy for the next exam and to set their goal for the next exam score. Feedback, goals, emotional reactions, and self-efficacy relative to the first and second exams and goals for the second and third exams were used to test our hypotheses. A temporal representation of the data collection is presented in Figure 2.

Measures

Behavioral Inhibition and Activation

To assess individuals' dispositional BIS/BAS activation, we used Carver and White's (1994) BIS and BAS Reward Responsiveness scales. The 7-item BIS scale asks participants to rate the extent to which they agree or disagree (on a 5-point scale) with items such as "Criticism or scolding hurts me quite a bit" and "I feel worried when I think I have done poorly at something." The BIS scale demonstrated internal reliability of .77. The BAS scale included five items, rated on a 5-point scale, including "When I'm doing well at something I love to keep at it" and "When I get something I want I feel excited and energized," and had an internal reliability of .69.

Self-Efficacy

We measured exam self-efficacy with a magnitude-strength survey (Wood & Locke, 1987). Before each exam, we asked students to indicate whether they expected to achieve each of seven levels of performance in the exam (i.e., answer at least 20 questions correctly, at least 25, at least 30, and so forth up to answering all 50 questions correctly) and how confident they were of attaining each level. Consistent with prior self-efficacy research, to construct the scores, we summed the confidence rating for the levels of performance that students indicated they could achieve.

Performance Feedback

After each mid-term exam, students were presented with the goal that they had previously set for the respective exam and with their actual exam score, and were then asked to indicate how they felt about their performance *relative* to their goal. That is, the performance feedback to which the participants were asked to react was the discrepancy between actual performance and their goal (PGDF; see Vance & Colella, 1990). Consequently, for each exam, we computed a PGDF score by subtracting the goal score from the actual performance score.

Emotional Reactions to Feedback

Following Bagozzi, Baumgartner, and Pieters (1998), respondents were asked to rate the extent to which they experienced a list of emotions in response to the question: "As a result of your performance on this exam relative to your goal, to what extent do you experience each of the following emotions?" The list of emotions comprised the terms: excited, delighted, happy, glad, satisfied, proud, self-assured, angry, frustrated, guilty, ashamed, sad, disappointed, depressed, worried, uncomfortable, and fearful. We combined the positive terms to form the Positive Emotional Reaction (PER) scale and the negative terms to form the Negative Emotional Reaction (NER) scale. Across the three measurements of emotional reactions, the reliabilities of the PER scores were .95, .96, and .97; the reliabilities of the NER scores were .93, .95, and .95 across the three measurements.

Analyses

We used path modeling to analyze the data collected for this study. We first tested a fully mediated path model (Model 1; considering only the solid paths from the general model presented in Figure 1) on each of two data sets. The two data sets consisted of (a) the discrepancy feedback from Exam 1, the emotional reactions to this feedback, and the self-efficacy and goals for Exam 2, and (b) the discrepancy feedback from Exam 2, the emotional reactions to this feedback, and the self-efficacy and goals for Exam 3. We did not use the Exam 4 data because 43% of the participants did not take Exam 4 (students were provided with a prospective course grade before Exam 4 and were given the option to take Exam 4 to improve their course grade). An alternative would have been to use only the data provided by students who did take Exam 4; we decided not to use this reduced sample because it has been subject to a self-selection bias, as those who did not take Exam 4 likely elected to do so because they had met their goals.

To examine whether the PGDF also has a direct effect on self-efficacy and goals, we estimated Model 2. This adds direct effects from PGDF to exam self-efficacy and from PGDF to subsequent exam goals to the paths specified in Model 1 (i.e., the dashed lines in the general model, see Figure 1). Because Model 2 is a saturated model, it will fit the data perfectly and thus we will not be able to assess whether emotional reactions and self-efficacy fully (vs. partially) mediate the effect of discrepancy feedback on future goals by examining fit indices. The magnitudes of the paths, however, will indicate whether discrepancy feedback has direct effects on goals, in addition to the indirect effects through emotional reactions and self-efficacy.

To test the moderating effects of the dispositional constructs (BIS and BAS) on individual's magnitudes of their emotional reactions to feedback, we estimated a third path model which included the direct effects of the dispositional constructs as well as their interactions with PGDF. Consistent with our testing of the other models, we tested this model utilizing data from the two exams pertinent to our research questions.

For each of the path models, fit will be assessed following recommendations put forth by Kline (2004) representing "the current state of practice and recommendations about what to report" (p. 134) when testing structural equation models. These include the model chi-square, root mean square error of approximation (RMSEA; Steiger, 1990), the comparative fit index (CFI; Bentler, 1990), and the standardized root mean square residual (SRMR).

Results

Table 1 presents the means, standard deviations, and intercorrelations among variables. Model 1, which specifies that emotional reactions to feedback fully mediate the effect of discrepancy feedback on subsequent self-efficacy and goals, represented the structure of the data very well, as reflected in the fit indices obtained for this model. The chi-square for the model was not significant. χ^2 (2, N = 493) = 2.46, $p > .10$, for the data following Exam 1 and $\chi^2 = 2.14$, $p > .10$, for the data following Exam 2. Additional fit indices likewise indicate that the model fits the data well (RMSEA = .02, CFI = .99, and SRMR = .01, for Exam 1 and RMSEA = .01, CFI = 1.0, and SRMR = .01, for Exam 2).

We present the standardized path estimates for Model 1 in Figure 3 (estimates included in the model are from responses to feedback collected following Exam 1/Exam 2 and prior to Exam 2/Exam 3). As expected, PGDF strongly influenced participants' emotional reactions (following Exam 1, $\beta = .52$, $p < .01$, and $\beta = -.47$, $p < .01$, for positive and negative emotional reactions, respectively, and following Exam 2, $\beta = .59$, $p < .01$, and $\beta = -.50$, $p < .01$, for positive and negative emotional reactions, respectively). In turn, emotional reactions influenced self-efficacy, and self-efficacy further influenced goals in both analyses.

Table 1. Means (*M*), standard deviations (*SD*), and intercorrelations for study variables

	M	*SD*	1	2	3	4	5	6	7	8	9	10	11
1. Behavioral inhibition (BIS)	17.40	4.19	–										
2. Behavioral activation (BAS)	16.68	2.12	.14	–									
3. PGDF after Exam 1	−7.24	5.63	.16	−.08	–								
4. Negative emotional reactions Exam 1	21.32	14.80	.11	.09	−.46	–							
5. Positive emotional reactions Exam 1	10.20	10.15	.07	.02	.52	−.56	–						
6. Exam 2 self-efficacy	527.93	108.85	−.12	−.02	.20	−.33	.24	–					
7. Exam 2 self-set goal	44.49	3.24	−.08	.07	.08	−.22	.14	.53	–				
8. PGDF after Exam 2	−6.47	5.67	.10	−.04	.38	−.11	.20	−.04	−.19	–			
9. Negative emotional reactions Exam 2	22.43	16.58	.17	.06	−.19	.49	−.22	−.19	−.13	−.50	–		
10. Positive emotional reactions Exam 2	11.47	11.47	.01	.02	.18	−.14	.32	.10	.08	.59	−.59	–	
11. Exam 3 self-efficacy	517.62	112.79	−.04	.08	.20	−.27	.21	.65	.42	.18	−.29	.27	–
12. Exam 3 self-set goal	44.15	3.82	−.04	.08	.14	−.20	.19	.44	.64	.10	−.19	.22	.55

Note. N = 493. For $r \geq .09$. $p < .05$; for $r \geq .13$. $p < .01$; tests are two tailed. PGDF, performance-goal discrepancy feedback.

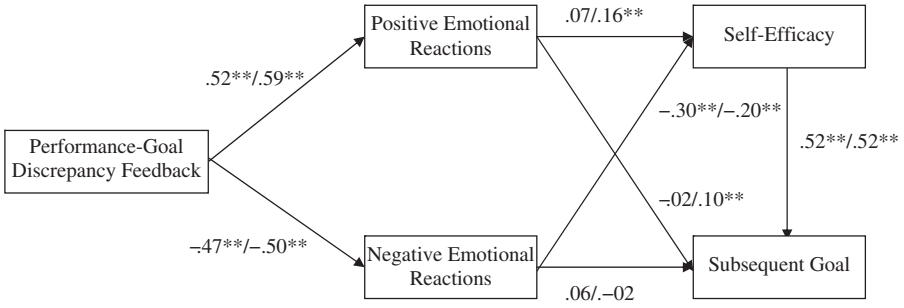


Figure 3. Path estimates for Model 1, predicting self-set goals for Exam 2/Exam 3.

Note. *$p < .05$. **$p < .01$; tests are two tailed.

The effect of negative emotional reactions on subsequent goals was fully mediated by self-efficacy in both the Exam 1 and the Exam 2 data (i.e., the direct path from NER to goals was small and not significant; $\beta = -.06$, $p > .10$, and $\beta = -.02$, $p > .10$), whereas positive emotional reactions had both direct effects ($\beta = .10$, $p < .01$) and mediated effects (through self-efficacy; $\beta = .16$, $p < .01$) in the Exam 2 data, with no direct effects of positive emotional reactions on subsequent goals, and with the effects of positive emotional reactions on self-efficacy only approaching significance in the Exam 1 data ($\beta = .07$, $p < .10$, one tailed).

We interpret the results described thus far as supportive of the mediated model proposed in this paper. The estimates for Model 2, presented in Figure 4, show that the direct effects from discrepancy feedback to self-efficacy ($\beta = .04$, $p > .10$, following Exam 1, and $\beta = -.01$, $p > .10$, following Exam 2) and goals ($\beta = -.07$, $p > .10$, following Exam 1, and $\beta = -.07$, $p > .10$, following Exam 2) were not significant. These results suggest that the effects of feedback on self-efficacy and goals are largely mediated by individuals' emotional reactions to the feedback.

For the first exam, 92% of the participants did not achieve their goal (see the negative mean PGDF score in Table 1). For the second exam, 85% of the participants did not meet their goal. These results are consistent with previous findings. Vance and Colella (1990, p. 75), for example, observed that "closer exam of our data reveals that personal goals remained consistently higher, on average, than performance." Similarly, Williams et al. (2000, p. 175) noted that "a significant majority of athletes set initial goals that were above their previous best performance, and in virtually every (98%) instance during the season they went into competition with goals that were above their best performance at that point in the season."

Because the large majority of participants received negative discrepancy feedback we could not investigate whether dispositional moderating effects on the relationships between positive discrepancy feedback and emotional reactions exist (we could only examine the moderating effect of BIS and not of BAS on the effects of feedback on emotional reactions). To test the moderating effect of BIS on the effect of feedback on emotional reactions, we estimated a third

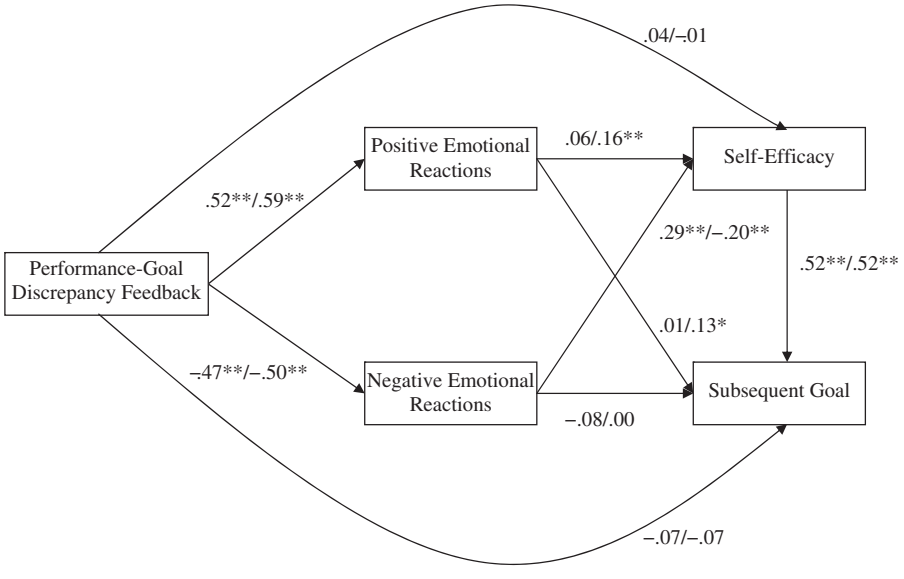


Figure 4. Path estimates for Model 2, predicting self-set goals for Exam 2/Exam 3.

Note. *$p < .05$. **$p < .01$; tests are two tailed.

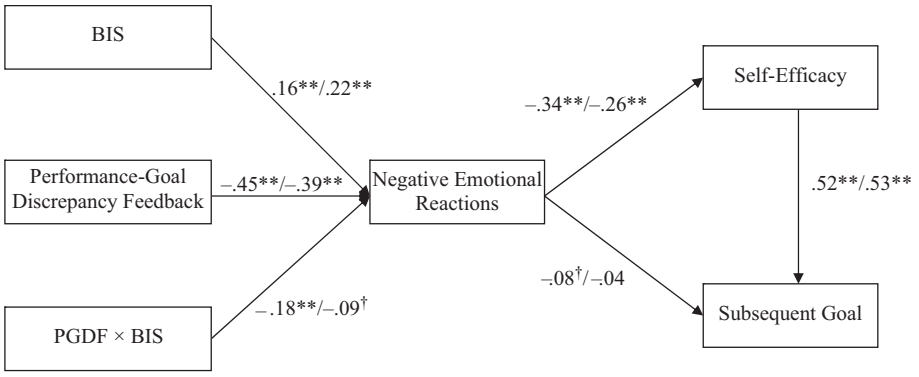


Figure 5. Path estimates for moderated effects model, predicting self-set goals for Exam 2/Exam 3.

Note. †$p < .10$ *$p < .05$. **$p < .01$; tests are two tailed.

path model in which PGDF, BIS, and the interaction between the two predicted negative emotional reactions.

The chi-square test for the moderated model was significant for the data from Exam 1, χ^2 (7, N = 451) = 15.68, $p < .05$, but was not significantly different from an exact fit for the data from Exam 2, χ^2 (7, N = 416) = 10.10, $p > .10$, suggesting that the model is generally a very good fit to the data. In addition, further fit indices suggest that the data from both Exam 1 and Exam 2 fit the model very well (RMSEA = .05, CFI = .98, and SRMR = .04, for Exam 1 and RMSEA = .03, CFI = .99, and SRMR = .04, for Exam 2). These values meet the cutoff criteria offered by Hu and Bentler (1999).

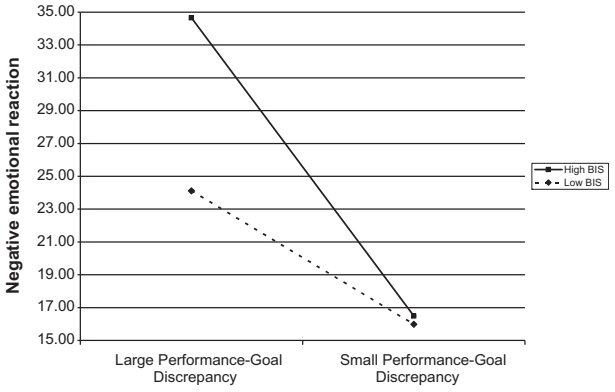
Figure 5 shows the moderated model and its standardized path estimates. The results indicate that the interaction between performance-goal discrepancies and one's dispositional inhibition tendencies (BIS) negatively predicts the individual's negative emotional reactions to exam feedback ($\beta = -.18$, $p < .01$ for Exam 1, and $\beta = -.09$, $p < .10$ for Exam 2). This suggests that in the presence of small discrepancies between performance, and goals, individuals will experience relatively low negative emotional reactions. However, when given feedback indicating large negative discrepancies, individuals with highly sensitive behavioral inhibition systems will have stronger negative emotional reactions than will individuals with less sensitive behavioral inhibition systems. Figure 6 illustrates the form of the moderated relationship between performance feedback and negative emotional reactions (using data following Exam 2).

Discussion

This study has several important findings that clarify the links among feedback, emotions, self-efficacy, and goals. First, the results showed that both emotions and self-efficacy play important roles in the goal-setting process, that is, emotional reactions to feedback influenced future goals and this effect was realized primarily through task (exam) self-efficacy. Second, it is important to note that in addition to the indirect effects of both positive and negative emotional reactions on subsequent goals, positive (but not negative) emotional reactions demonstrate some additional direct effect on future goals. The differential result with respect to positive and negative emotional reactions suggests that, besides self-efficacy, positive emotions influence goals through other mechanisms. We can only speculate on this issue, but it is entirely possible that the positive emotions influence goals through a valence-expectancy mechanism by which positive emotions increase outcome valence and therefore lead to increased motivation and higher goals.[1] Nevertheless, the present results suggest that feedback influences self-efficacy primarily through emotional reactions. In combination, these results attest to the difficulty of separating the role of emotion and cognition in explaining motivational self-regulation.

Third, the results of this study offer support for the dispositional moderating effect of an individuals' BIS and the link between negative discrepancy feedback and negative emotional reactions. This relationship is important due to the connection between emotions and goal setting, as specified in this, and other research (Cron, Slocum, VandeWalle, & Fu, 2005; Ilies & Judge, 2005). In fact, an important contribution of our research is to examine the effects of BIS activation, as past research has indicated that activation of the BIS results in inhibition of goal pursuit (Carver & White, 1994). Our study suggests that one path through which this goal inhibition occurs is through the effects of performance feedback on emotional reactions, self-efficacy, and subsequent goals in individuals with a highly salient BIS.

[1] See, for example, Erez and Isen (2002) who found that positive affect influenced not only performance expectancies but also valence and instrumentality.



Note. Low BIS and small performance-goal discrepancy represent scores one standard deviation below the grand mean on the respective measure; High BIS and large performance-goal discrepancy represent scores one standard deviation above the grand mean on the respective measure.

Figure 6. Effects of performance-goal discrepancy magnitude on negative emotional reactions, as moderated by BIS (reaction to Exam 1 feedback).

Implications for Theory Development and Practice

From a theoretical standpoint, this research advances the understanding of the psychological mechanisms that individuals use in interpreting and responding to performance feedback. The results provide support for a conceptual model of goal setting in which PGDF influences emotions and self-efficacy judgments and these constructs, in turn, influence subsequent goals. Furthermore, the investigation into the process through which emotions influence goals revealed that emotional reactions to feedback influenced goals, in part, through judgments of self-efficacy.

This research also advances individual differences theory by examining the role of individual differences in broad behavioral motivation systems (i.e., the BIS) in motivational self-regulation. As noted, the results suggest that the chronic activation levels of individuals' BIS, or the extent to which they are generally prone to respond to inhibiting stimuli, influence their responses to failure feedback. This proposal may seem to be at odds with more traditional feedback theory. That is, traditionally, feedback researchers have examined the role of individual differences in self-esteem in regulating responses to failure (Brockner, Derr, & Laing, 1987). However, self-esteem and the BIS may not be independent, as suggested by the typical high (negative) correlation between self-esteem and neuroticism (Judge, Erez, & Bono, 1998) and the conceptual link between neuroticism and the BIS (Carver, Sutton, & Scheier, 2000). Thus, the research presented may stimulate another conceptual path for integrating, or distinguishing among, neuroticism and self-esteem – through the BIS.

The findings of this study also have implications for practice, as they suggest that managers should take individuals' personal characteristics into account when they deliver negative feedback. The results showed that those with increased inhibitive tendencies were more sensitive to negative feedback than others, which would lead to decreased motivation levels after failure. Whereas negative feedback can be motivating (Kluger & DeNisi, 1996), when such feedback becomes excessively negative it will be detrimental to motivation (e.g., it will lead to lower goals) and performance (Donovan & Williams, 2003). Our results suggest that individuals' dispositions influence their resilience to negative feedback and can be used to predict the inflection point at which negative feedback becomes demotivating.

Limitations

This study has limitations that merit discussion. First, not all constructs that may add to the explanation of goal setting were measured in this study. We did not measure attributions, feedback acceptance, or whether the feedback threatened participants' self-esteem. In addition, we did not study the task strategies used by individuals to accomplish their goals. That "people form intentions that include plans and strategies for realizing them" is specified by both social cognitive and goal-setting theories (Bandura & Locke, 2003, p. 97), and task strategies have also been included in recent feedback models (Ilgen & Davis, 2000). Future self-regulation research should consider including concepts and processes as those described above.

Second, the research participants were undergraduate students who reported their exam goals and their emotional reactions to their performance relative to their goals. This limits the extent to which these findings may generalize to the adult working population and to actual work performance. However, because exam scores are salient to students and their performance has important consequences, this work nicely complements laboratory research (e.g., Ilies & Judge, 2005) where the tasks are less relevant for the participants.

Third, although this study involved tasks separated in time and assessed emotional reactions, goals, and self-efficacy in an appropriate temporal order relative to feedback and performance (i.e., satisfying the condition of temporal precedence required for causal inferences), the path analyses used in this study did not model the relationships among these constructs at the within-individual level because we did not have enough repeated measures to allow us to model the effects within individuals. In other words, our results indicate that participants who received more positive feedback had higher self-efficacy beliefs and set higher goals than those who received less positive feedback, but do not tell whether a certain individual sets higher goals after receiving more positive feedback compared to a performance episode when the individual receives less positive feedback.

Although our study does contribute to the literature on self-regulation, future research testing relationships such as those specified in this paper via within-individual analyses certainly has the potential to further contribute to the literature on motivational self-regulation. Furthermore, studies examining performance-goal discrepancy monitoring over

time as a continuous process, or investigating how self-efficacy changes as one nears a performance episode, could potentially lead to a richer understanding of self-regulation processes. For example, such studies can perhaps elucidate the role of learning in self-regulation by examining how students' self-efficacy changes as they approach an exam and how these changes depend upon learning and preparation. These studies can also increase our understanding of the role of discrepancy monitoring beyond linear effects by, for example, investigating whether the rate of change in the discrepancy is more important than the size of the discrepancy.

Contributions

The limitations of this study should be evaluated in light of its contributions. First, an important contribution of this research is that it integrates emotion and cognition in the process of goal setting, by explaining how individuals adjust their goals as a function of performance-goal discrepancies and their subsequent emotional reactions and self-efficacy judgments. Given the prevalence of goal setting in organizations, this paper adds to a valuable stream of research that could have significant impact on individuals, teams, and organizations.

Second, this study contributes to the literature on the dispositional source of task and work motivation by going beyond the investigation of direct dispositional effects on goal setting and examining the role of the dispositional parameters of the behavioral inhibition and activation systems in the process of goal setting across multiple performance episodes. This approach, and the initial results reported here, should stimulate further integration of the BIS/BAS framework into motivation and self-regulation theory.

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