

How Feedback Influences Persistence, Disengagement, and Change in Goal Pursuit

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A chapter to appear in Aarts, H. and Elliot, A. *Goal-directed behavior*. Psychology Press.

Feedback is essential for pursuing goals. It enables individuals to adjust their efforts and decide which goals to pursue and which to let go, at least temporarily. Thus, feedback affects goal persistence, disengagement, and goal change. For example, employers give performance evaluations to help an employee decide how much to invest in her job and a teacher provides grades to students to help students decide how much effort to devote to studying for an exam. In addition, receiving feedback on one's current physical state in a medical checkup influences one's pursuit of health goals and receiving feedback from close others influences a person's attention to a friend or a spouse. At certain times, people are more likely to attend to any of these goals after receiving positive feedback than after receiving negative feedback, whereas at other times negative feedback prevails. Accordingly, this chapter examines when and how positive and negative feedback influence goal persistence and when they promote goal disengagement and change.

We distinguish between positive and negative feedback. We define positive feedback as feedback on accomplishments, strengths, and correct responses, and negative feedback as feedback on lack of accomplishments, weaknesses, and incorrect responses. For example, students often receive feedback on academic accomplishments or lack of accomplishments (e.g., when getting on the dean's list vs. failing to do so), their strong versus weak academic areas, and correct versus incorrect exam answers. In addition to these various types of positive and negative feedback, often the same level of objective achievement can be presented as either positive or negative. For example, a teacher can emphasize that a student solved correctly 90 percent of the questions on an exam or that she failed to solve 10 percent of them. Because of these different framings of performance, asking when positive feedback (e.g., emphasizing 90% correct

answers) has different motivational consequences than negative feedback (emphasizing 10% of mistakes) is often possible, regardless of the objective level of performance on a goal.

We organize this review of feedback and goal pursuit in several parts. We start with a review of research that offers a universal answer: people express greater motivation to persist on a goal after they receive either positive or negative feedback. This research helps us identify the unique self-regulatory processes in which positive versus negative feedback facilitate goal pursuit. As we demonstrate, positive feedback increases motivation when people infer they have greater ability to pursue the goal or associate the positive experience with increased goal value. In contrast, negative feedback increases motivation through a discrepancy-reduction mechanism.

We then review research that identifies the circumstances under which different self-regulatory processes are more likely and therefore positive versus negative feedback will increase motivation to pursue a goal. Specifically, we address attribution theory, mood theory and our work on the dynamics of self-regulation, to explain when each feedback – positive versus negative –increases motivation.

### **How Feedback Impacts Motivation**

Several theories that explore how feedback impacts goal persistence offer a universal answer to the question of whether people persist on a goal more when they receive positive rather than negative feedback on their performance. These theories identify distinct self-regulatory processes in which feedback influences performance motivation. By exploring the separate “cases” for positive versus negative feedback as a motivational force for goal pursuit, we can thus identify the different self-regulatory processes and the role of feedback in each of them.

***Positive feedback increases motivation***

According to classic psychological theories of motivation, goal persistence is a function of the goal's value  $\times$  expectancy of attainment (Atkinson, 1957; Feather, 1982; Fishbein & Ajzen, 1974; Lewin, Dembo, Festinger, & Sears, 1944; Liberman & Förster, 2008; Vroom, 1964). Feedback can possibly increase motivation by raising attainment expectancies as well as the perception that the goal is valuable. In what follows, we review the evidence that feedback impacts expectation and valuation.

***The information in feedback.*** Beginning with attitudes research, researchers argue that feedback on successful actions encourages individuals to invest more resources in pursuit of other, similar actions. A key finding in that literature is that people desire to be consistent and express stable preferences over time (Bem, 1972; Cialdini, Trost, & Newsom, 1995; Festinger, 1957; Harmon-Jones & Mills, 1999). Therefore, after successfully carrying out an action, the likelihood of choosing similar actions on the next opportunity increases. For example, if a person agrees to display a small sign in her window to advocate driving safety, the person will later feel she should choose to engage in actions consistent with her earlier behavior such as displaying a much larger sign on her lawn to advocate for the cause (Freedman & Fraser, 1966). According to self-perception theory, the reason for this impact of feedback is that people learn about their stable preferences from watching themselves act in a particular way (Bem, 1972). For example, when an individual considers she was successful at her job, she might come to infer she values her job and does it well, more than if she considers her lack of success. As a result, positive feedback provides information that will increase effort investment.

Goal research often makes a similar point, suggesting that positive feedback promotes goal persistence by increasing outcome expectancies and thus, commitment to a goal. According

to Bandura's self-efficacy theory, positive feedback increases individuals' sense of self-efficacy—that they are competent in pursuing a goal—therefore, their efforts will pay off (Bandura, 1991). Specifically, mastery experiences are an effective way of developing a strong sense of self-efficacy. In comparison, failure and negative feedback weaken a person's sense of self-efficacy. Research on academic performance demonstrated these influences: students' sense of self-efficacy, which is largely determined by their successful academic experiences, predicted their academic performance after controlling for other variables, including previous academic performance and other people's expectations (Bandura, Barbaranelli, Gian, & Conchetta, 2001). In addition, research within an organization context (Audia, Locke, & Smith, 2000) found that employees in the airline and trucking industries who received positive feedback (e.g., they had a fast turnaround time between flights or unloading a shipment) developed a strong sense of self-efficacy and exhibited greater motivation to pursue their work-related goals subsequently.

When positive feedback is useful, negative feedback is often harmful and more specifically, negative feedback can undermine motivation by lowering the expectancy of success. Evidence for this impact comes from research on the what-the-hell effect: after failing to pursue a goal, individuals concluded they were (at least temporarily) less able to succeed on a goal and, consequently, they disengaged. For example, in one study smokers gave up on their attempt to quit smoking after smoking a single cigarette, because they concluded that they were bound to fail, at least in the near future (Cochran & Tesser, 1996; Soman & Cheema, 2004).

Realizing the impact of feedback on outcome expectations, social agents whose role is to give feedback often use positive feedback to increase recipients' commitment and therefore, their performance. In doing so, they assume such feedback encourages individuals to internalize or integrate new goals to their self-concept, thus increasing the likelihood the individuals will be

more committed to pursuing the goal on subsequent occasions (Ryan & Deci, 2000). For similar reasons, some social agents further avoid negative feedback that can promote goal disengagement. We return to these strategic uses of feedback in our Implications section.

*The affective consequences of feedback.* Another route by which positive feedback increases motivation involves the affective consequences of feedback. Not only does positive feedback carry information about one's accomplishments, strengths, and correct responses, but, it further elicits general positive affect as well as specific feelings, including emotions (i.e., feelings that are specific to a source such as feedback) and mood (i.e., general and diffuse feelings that their cause is not identified). The experience of positive affect and feelings can, in turn, become implicitly associated with the goal and thus increase the perceived value of the goal.

In particular, research documented that an implicit association between goal activities and positive evaluations can induce approach motivation without providing any information on the goal or altering one's expectation of success. In this case, the affective consequences of the feedback act as a reward (vs. punishment) in monitoring behavior: the cues for a goal are paired with positive stimuli and individuals feel good about pursuing their goals, which makes them more likely to initiate and persist on these goals. In this route, positive feedback impacts motivation merely via the positive feelings it evokes. Similarly, negative feedback that elicits negative feelings can undermine motivation if these negative feelings are associated with goal-related stimuli and evoke avoidance motivation.

Research that explored the motivational impact of affective cues often used an evaluative-conditioning paradigm to demonstrate how implicit associations between affective cues and goals influence goal pursuit (Aarts, Custers, & Holland, 2007; Aarts, Custers, &

Veltkamp, 2008; Custers & Aarts, 2005; see also Ferguson, 2008). Notably, these affective cues were usually not the result of performance feedback; however, it is a reasonable assumption that because feedback has affective consequences, it can trigger these processes. For example, participants in one study grew fond of doing puzzles when the word “puzzles” appeared in proximity to positive affective stimuli (vs. control stimuli). As a result of this manipulation, those for whom doing puzzles was paired with positive affect engaged in puzzles in their free time more than in the absence of positive affective association (Custers & Aarts, 2005). Custers and Aarts further showed that associating doing puzzles with negative affect decreased the evaluation of the behavior, but not the motivation to pursue it. Negative affect only decreased motivation when a pre-existing (positive) goal was linked to negative affect, in which case motivation was reduced to the same level as a baseline (Aarts, Custers, & Holland, 2007). For example, priming concepts related to the goal of socializing (using words such as “socializing” and “partying”) in proximity to negative affective words (e.g., “pain” and “trash”), inhibited accessibility of the goal representation such that it was not different than the baseline, no goal-prime condition (Aarts et al., 2007). Taken together, research on evaluative conditioning finds that positive implicit evaluations increase the desire to pursue a goal and actual effort exertion whereas negative implicit evaluations cancel out the motivational impact of active goal states. Negative affect thus, acts as feedback in the process of goal-directed behavior by decreasing the motivational force of an activate goal that is already positive or desired.

Importantly, this impact of affect as feedback is distinct from the impact of performance feedback on motivation. Affect or feelings provide feedback for self-regulation even if are not triggered by performance feedback. We return to this point when addressing the impact of mood

attributions. For now, we note that performance feedback has affective consequences and these affective responses influence goal pursuit.

Overall then, the case for positive (and against negative) feedback comes from research that examines how feedback impacts the expectancy of goal attainment and the value individuals assign to a goal. When positive feedback impacts expectancy and value, it will increase commitment to the goal and negative feedback will decrease goal commitment.

### ***Negative feedback increases motivation***

In a discrepancy model of self-regulation, negative feedback prevails—it promotes goal-directed behavior more than positive or no feedback. Specifically, the cybernetic model describes the process of self-regulation as discrepancy-closing (Carver & Scheier, 1998; Miller, Galanter, & Pribram, 1960; Powers, 1973). According to this model, when a person strives toward a desired end state, the motivational system calculates the size of the discrepancy between the present state and the desired state and guides action toward closing the gap between the two. The acronym “TOTE” (Test, Operate, Test, Exit) is often used to denote this process. According to this notion, once the person identifies a desired end state, she assesses the required effort to reach this state (Test), which leads her to put effort into achieving it (Operate), which then requires another assessment of the distance (Test), which cycles around recursively until the process ends once the end state is achieved (Exit). For example, a person may perceive he needs to go on a diet. He calculates how much weight to lose (Test), trims calories and exercises (Operate), and steps on the scale from time to time (Test). He stops dieting when the gap is closed because he has successfully reached his goal (Exit), unless he concludes the goal is out of reach and alters it.

Research by Carver and Scheier (1990) developed these ideas into a self-regulatory model of feedback loops. Their model claims that performance outcomes elicit positive and

negative emotions, which provide feedback for the self-regulatory system. Positive emotions provide positive feedback, suggesting the rate of closing the gap to goal attainment is faster than expected. In this situation, people reduce their effort or “coast.” In contrast, negative emotions provide negative feedback, suggesting the rate of closing the gap is slower than intended. In this situation, people increase their effort investment. A main prediction from this model is that people will work harder toward a goal when they receive negative feedback that makes them feel bad about their goal than when they receive positive feedback that makes them feel good about that goal.

Indirect empirical support for the inhibiting impact of positive feedback comes from studies that provided feedback on one goal and then measured effort investment in pursuit of another goal. The feedback loops model predicts that positive emotions are a sign to relax pursuit of a focal goal and focus on another, presumably neglected goal (Carver, 2003), hence these studies induced success and positive mood in one goal context and assessed participants’ interest in attending to goals in another context. For example, Trope and Pomerantz (1998) tested whether people who had a successful experience are more interested in learning about their weaknesses and areas of improvement in another context. They found that after having a successful experience that induced positive mood, participants wanted to learn about areas of self-liabilities more than participants who had experienced failure and were therefore in a negative mood. Reed and Aspinwall (1998) similarly found that caffeine users who had an opportunity to affirm their kindness – a procedure that provided a positive feedback of oneself – were subsequently more open to information about the potential health threats from consuming caffeine than those who were not afforded the chance to affirm their kindness prior to receiving the negative information. These studies provide indirect support for Carver and Scheier’s model

because participants directed their efforts to another goal rather than relaxed their efforts on the focal goal (e.g., switching from pursuing their kindness to health goal).

Congruent with the prediction put forth by the cybernetic models, research on licensing effects documented that positive feedback on successes signals sufficient accomplishment and that one can attend to another goal. Such an inference “licenses” the individual to direct efforts elsewhere (Khan & Dhar, 2006). For example, research on moral licensing finds that expressing egalitarian attitudes in one context increases the likelihood that a person will engage in discriminatory actions in another context because the positive feedback from the initial behavior justifies relaxing the egalitarian goal (Monin & Miller, 2001). Similarly, Khan and Dhar (2006) argued that consumers pay small tokens to justify hedonic choice, for example, consumers give a small amount of money to charity, which subsequently justifies purchase of guilt-provoking hedonic items (e.g., hot fudge sundae; Strahilevitz & Myers, 1998)

By that logic, negative feedback should increase persistence. Indeed, research on the sunk-cost effect has found that people justify their prior failed efforts by persisting with a course of actions that pursues the same failed goal, because they are not getting positive feedback on making sufficient progress on the goal (Arkes & Ayton, 1999; Arkes & Blumer, 1985; Thaler 1991). To illustrate, participants in one study were given the chance to purchase a season’s worth of university theater tickets at full price, at a slight discount, and at a steep discount. Compared with those who purchased full price tickets, those who purchased discounted tickets attended fewer plays – thus, those who had “sunk” the most money into buying the tickets (and received negative feedback on paying too much) were most motivated to attend the theater, even if they would prefer to spend their time another way (Arkes & Blumer, 1985).

In his self-discrepancy theory, Higgins similarly proposes that discrepancies – indicated by negative feedback– motivate goal adherence (Higgins, 1987). Higgins’ theory distinguishes between the different types of goals individuals pursue – promotion and prevention goals – and which evoke different processes of discrepancy-closing. The basic distinction is between goals that obtain pleasure and goals that avoid pain (e.g., get food vs. stay alive). Self-regulation with a promotion focus is centered on increasing the presence of positive outcomes or gains, whereas self-regulation with a prevention focus involves fixating on decreasing the presence or absence of negative outcomes or losses. The emotional feedback of pursuing promotion goals further differs from those of prevention goals. For promotion goals, successful pursuit results in happiness and failure results in sadness, because these emotions characterize the presence versus absence of gains. In contrast, for prevention goals, successful pursuit results in feeling calm and failure results in anxiety, because these emotions characterize the absence versus presence of losses. Thus, the experience of negative promotion emotion (e.g., sadness) motivates pursuit of promotion goals whereas the experience of negative prevention emotion (e.g., anxiety) motivates pursuit of prevention goals.

More recent work by Higgins, Förster and colleagues on regulatory focus theory argues that negative feedback is particularly effective for the pursuit of prevention goals and might be less effective for the pursuit of promotion goals. In one study (Förster, Grant, Idson, & Higgins, 2001), these researchers measured the strength of motivation by the amount of time participants spent trying to solve a series of anagrams. Participants either pursued the goal with a promotion orientation (gaining points for correct solutions) or with a prevention orientation (trying not to lose points for missing solutions). The researchers found that success feedback increased motivation more than failure feedback for those who were pursuing a promotion goal (gaining

points) but failure feedback increased motivation more than success feedback for those who were pursuing prevention goals (avoid losing points). Consistent with the “a goal looms larger” effect in goal-directed behavior (Hull, 1934; Kivetz, Urminsky, & Zheng, 2006; Losco & Epstein, 1977), these effects of feedback became more pronounced as the goal end state became closer.

But, not only do goals vary by their focus on promotion versus prevention. Individuals too, vary by their chronic strategy for approaching their goals—a promotion versus prevention strategy—and these chronic strategies often influence their motivation to invest in a goal, depending on the framing of the goal as fitting their chronic strategy or not. For instance, in one study (Shah et. al, 1998), participants were first tested for their pre-existing promotion versus prevention orientation. They then performed an anagrams task and were either told they would earn an extra dollar if they solved 90% of the possible anagrams (promotion frame) or that they would avoid losing a dollar of pay if they did not miss more than 10% of the words (prevention frame). Those with a chronic promotion focus performed better when they were assigned to the condition emphasizing a promotion strategy (solve 90% of the anagrams) whereas those with a chronic prevention focus performed better when they were assigned to the condition emphasizing the prevention related strategy (miss less than 10% of the anagrams).

Evidence for the undermining impact of positive feedback also comes from research on implicit self-regulation. This research finds that positive feedback on goal completion results in disengagement or “post-fulfillment inhibition”: a temporary state of inhibiting the goal that was achieved. For instance, in one study (Förster, Liberman, & Higgins, 2005) participants reviewed a series of pictures with the goal of finding a picture of glasses. After finding the picture, participants took longer recognizing the word “eyeglasses” in a lexical decision task compared with participants who were not searching for the glasses picture to begin with. Thus, positive

feedback on goal fulfillment (finding the eyeglasses) resulted in post-fulfillment inhibition of the construct of glasses – inhibition that is a functional self-regulatory strategy that enables individuals to put aside a completed goal and switch to something else. Thus, whereas some research on implicit self-regulation documented that active goals inhibit competing ones (e.g., the goal to work out inhibits the goal to study, Shah, Friedman, & Kruglanski, 2002), once a person receives positive feedback on goal attainment, the focal goal is inhibited and competing goals become more accessible and readily pursued.

To summarize, the research that emphasizes the motivating impact of negative feedback often portrays self-regulation as a process of making progress toward reducing a discrepancy. The individuals who pursue a goal wish to progress at a sufficient pace and negative feedback increases their motivation by signaling their progress is insufficient. This process of self-regulation is different than the one portrayed by research emphasizing the motivating impact of positive feedback, and we conclude that no universal answer exists regarding which feedback is more motivating. Rather, it depends on the self-regulatory processes, which can give advantage to either valence of feedback. Specifically, feedback that provides information on the value of a goal and expectancy of attainment (i.e., commitment) has a different impact than feedback that provides information on the level of progress toward a goal. In what follows, we identify when each of these self-regulatory processes—evaluating commitment versus monitoring progress—will take place and thus the circumstances under which each form of feedback—positive versus negative—is more effective at motivating goal pursuit. We argue that both processes characterize goal striving (although most likely, evaluating commitment dominates goal setting), and there are several variables that determine which process takes place.

### **When Positive versus Negative Feedback Increases Motivation**

The research reviewed thus far assumes that when positive feedback is motivating, negative feedback undermines motivation for goal pursuit, and when negative feedback is motivating, positive feedback undermines motivation. That research identifies the different processes of self-regulation but often leaves open the question of when each process is more likely and thus when each type of feedback is more effective in promoting goal-directed behavior. In order to address this question, in this section we review research on attribution theory, including mood attributions, and our research program on the dynamics of self-regulation.

#### ***Attribution theory***

Research on attribution theory traditionally addresses the relative impact of positive and negative feedback in the context of achievement motivation (see Elliot & Dweck, 2005; for a review on achievement motivation). It suggests that the attribution of feedback determines its impact of performance on achievement (e.g., academic) goals. Beginning with Weiner's attribution theory (Weiner, 1974), research suggested that individuals make three types of attributions of achievement feedback: locus of control (internal vs. external), stability (causes change over time or not), and controllability (high vs. low). These attributions give meaning to the feedback that determines its motivational consequences. For example, a student who receives positive feedback on her academic achievement will increase her efforts if she attributes her success to an internal (vs. external) locus of control and unstable causes such as effort (vs. stable cause, such as talent). That student, will also be motivated to study if she receives negative feedback and attributes it to an external factor (difficult test) or an internal factor that is unstable (lack of effort).

Research by Dweck and colleagues expands attribution theory and identifies lay theories that people hold in the context of achievement motivation and that guide their responses to feedback. Dweck's model draws a distinction between two implicit theories of intelligence that vary by the attribution of academic performance: "Entity" theorists view intelligence as an unchangeable, fixed characteristic, whereas "incremental" theorists view intelligence as malleable and increasing through effort. In turn, negative feedback undermines learning motivation among entity theorists who infer their ability is low, but less so for incremental theorists who infer they have not put enough effort into the task (Dweck & Leggett, 1988; Elliott & Dweck, 1988). Dweck's model received support across various academic settings. For example, in a field study with college students, those students who performed poorly on proficiency examinations were less interested in taking remedial classes when they held an entity theory of intelligence than when they held an incremental theory of intelligence (Hong, Chiu, Dweck, Lin, & Wan, 1999). Other studies found that the attributions of feedback to ability versus effort influence the strategy people use to repair their self-esteem after receiving negative academic feedback. In one study, those who believed in fixed intelligence (entity theory) chose defensive strategies such as downward comparison to less successful individuals or undergoing a tutorial on already mastered material. In contrast, those who believed in improvable intelligence (incremental theorists) chose remedies in the form of self-improvement strategies, including upward comparisons and a tutorial on material that have not mastered yet (Nussbaum & Dweck, 2008).

Effects of entity versus incremental theories also emerged in other self-regulatory contexts and in the pursuit of a variety of goals. For example, research by Miele and Molden (2010) on fluency effects found that when materials were conveyed in a disfluent fashion (e.g.,

participants had to read blurry and hard-to-read fonts vs. easy-to-read fonts), entity theorists rated their comprehension as lower whereas incremental theorists rated their comprehension as higher. Presumably, the negative perceptual feedback from disfluent materials deterred entity theorists from working harder to process the information but the same negative feedback encouraged incremental theories to increase their efforts to overcome the deterrence.

### ***Mood attributions***

Other attribution research examines the impact of mood attribution on goal persistence and change. As stated earlier, feedback has affective consequences, including specific emotions and unspecified moods. These affective consequences mediate the impact of feedback on goal pursuit (Baumeister, Vohs, DeWall, & Zhang, 2007; Carver & Scheier, 1998; Higgins, 1987). In particular, because moods do not have a clear source, the attribution of (negative or positive) moods that resulted from feedback to different sources alters the impact of feedback on subsequent motivation.

Research on the mood-as-information perspective examined this notion (Schwarz & Clore, 1983). This research asserts that positive mood provides information that the environment is safe and that the cost of making the wrong decision is relatively negligible, whereas negative mood signals threat and lack of positive outcomes. People use their mood as information on which to base various judgments, including life satisfaction, the value of their goals, and so on. However, this information is discounted if people attribute their mood to a source unrelated to the subject of the judgment (e.g., the weather). For example, in Schwarz and Clore's (1983) studies, when participants were in a positive mood they reported higher life satisfaction unless their good mood was attributed to a source unrelated to this particular judgment therefore leading them to disregard their feelings (see also Gendolla & Krüsken, 2002). The mood-as information

perspective further suggests (although it has yet to be empirically demonstrated) that misattributing one's mood to an unrelated source could lead one to overcorrect for or its possible influences (e.g., Schwarz & Clore, 2007; Wilson & Brekke, 1994). In such cases, the effect of mood is not only discounted but rather is reversed. For example, in evaluating a potential goal end state, a person might boost her valuation when she is in a positive mood, unless she attributes her mood to unrelated source (e.g., an earlier event). If the mood appears irrelevant, the person might worry that her positive mood colors her positive evaluation of her goal, consequently leading her to overcorrect for this possible bias by intentionally evaluating the goal more negatively.

A related view was recently offered by Clore and colleagues, who suggested that positive mood validates and negative mood invalidates accessible cognitions (Clore & Huntsinger, 2007). According to their model, people ask themselves how they feel about different things, including their goals. Positive mood signals that the goal is valuable (a go signal) whereas negative mood signals that it lacks value (a no goal signals). In accordance with research on mood-as-information, research on mood as a "go / no-go" signal assumes that mood provides information for self-regulation to the extent that it is deemed goal-relevant, that is, to the extent that a person believes it is valuable feedback.

Other research attests that attribution of mood to a goal-irrelevant source may also impact self-regulation, although the mood no longer conveys information on performance. The reason is that the experience of positive affect is associated with approach responses (Cacioppo, Gardner, & Berntson, 1999) and feelings of resourcefulness (Aspinwall & Taylor, 1997; Raghunathan & Trope, 2002; Trope & Pomerantz, 1998) – both of which increase the tendency to adopt and then pursue an accessible goal. For example, Fishbach and Labroo (2007) found that positive-mood

participants tended to adopt whichever goals were salient in the situation whereas negative-mood participants rejected pursuit of these salient goals.

Research on stop-rules by Martin and colleagues offers yet another perspective for the role of mood attributions in self-regulation. This research suggests that positive mood results in disengagement when people interpret it as a signal that they have done enough (“stop when you feel you have done enough”). In contrast, positive mood increases goal engagement when people interpret it to as a signal that they like the task (“stop if you do not like the task;” Hirt, Melton, McDonald, & Harackiewicz, 1996; Martin, Ward, Achee, & Wyer, 1993). To illustrate, participants in one study (Martin et. al, 1993) were asked to read a series of behaviors before forming an impression of the actors of these behaviors. The task of forming impressions was ambiguous – participants could either view it as interesting and enjoyable or as a chore they had to complete. When told to read about a fictitious person’s various behaviors until they had enough information, those in a positive mood stopped reading sooner than those in a negative mood because their positive mood informed participants that they had done enough. In contrast, when told to stop when they no longer had a good time, those in a negative mood stopped reading the list of behaviors sooner than those in a positive mood; because those who experienced positive mood inferred that they can – and should – continue working.

Overall then, attribution and mood theories suggest that either positive or negative feedback can promote goal pursuit, depending on the meaning people give to feedback on their goals and to their resulting mood. Mood theory further suggests that not only does feedback has affective consequences that influence self-regulation but it also influences self-regulation directly, when it is not the outcome of feedback. We next move to our research on feedback and how it impacts goal pursuit depending on the dynamic of self-regulation individuals follow.

### *Dynamics of Self-Regulation*

Our research program on the dynamics of self-regulation identifies the conditions under which positive versus negative feedback increase the motivation to adhere to a goal. This research program distinguishes between two patterns of goal pursuit that have opposite implications for when positive and negative feedback facilitate goal persistence versus justify disengagement and switching to another goal (see Fishbach, Zhang & Koo, 2009, for a review). We suggest that when individuals pursue a goal, their level of performance can signal either commitment to a desirable end state or pace of progress toward this state. When people interpret pursuit of a goal as a signal of their commitment, they *highlight* that goal after successful pursuit. That is, they prioritize the goal by making consistent choices after successes and forgoing the goal after lack of successes. When people interpret pursuing a goal as a signal of their progress, they *balance* between this goal and others. In doing so, they alternate goals after successes and focus on pursuing the focal goal after unsuccessful actions. To illustrate, a student who infers her level of commitment based on academic performance will highlight her goal by focusing on her academic work after experiencing successes (e.g., a high mark on a paper), and forgoing her academic work after experiencing a lack of success (e.g., a poor exam grade). In contrast, a student who infers his level of progress on the basis of academic performance will balance by forgoing academic work after successes, because sufficient progress was achieved, but increase his effort after lack of successes, because negative feedback signals more work is needed.

According to this model, two factors promote goal-directed behavior: (a) the presence of goal commitment, which people infer from positive feedback on successes, and (b) the lack of goal progress, which they infer from negative feedback on failures. Conversely, low commitment, which people infer from failing to pursue a goal, and sufficient progress, which

they infer from successfully pursuing a goal, can both undermine the motivation to choose actions that further a focal goal. Importantly, these two representations of goal striving—expressing commitment versus making progress—characterize goals that do not have a particular end state as well as goals that do (e.g., general health and career goals vs. meeting a charity goal or completing an assignment at work). Often, both representations are equally plausible; however, at times, one representation is more plausible than the other. For example, when people invest in a goal without making progress (e.g., in sunk cost situations, Arkes & Ayton, 1999), they will infer greater commitment but not progress. Or when people pursue a goal under externally imposed controls, they will infer making progress without also inferring greater commitment. As an illustration, we (Finkelstein & Fishbach, 2010) found that imposed healthy eating (e.g., when we asked people to eat food framed as “healthy”) makes people hungrier than when they choose to eat healthy food or when they eat the same food framed as “tasty” without emphasizing its healthy characteristics.

Notably, these goal representations do not comprise a stage model (e.g., goal setting vs. striving, see for example, the Rubicon model of action phases; Heckhausen & Gollwitzer, 1987). Rather, self-regulators both evaluate their commitment and monitor their progress in the course of striving toward a goal and they monitor their efforts according to their goal representation and with respect to past actions they have taken and upcoming actions they plan to take. A number of variables, then, influence whether people represent goal pursuit in terms of commitment or progress and thus, whether they then exhibit a dynamic of highlighting and increase engagement in response to positive feedback, or a dynamic of balancing and increase engagement in response to negative feedback. We next review these variables, which we summarize in Table 1.

*Framing questions.* Asking individuals whether their actions reflect their commitment to a goal versus progress on the goal may influence how they frame these actions to themselves and consequently whether their motivation increases in response to positive or negative feedback. The reason framing questions have such impact is that to answer the questions, individuals need to adopt the appropriate goal frame in explaining their level of performance for themselves, at least temporarily.

In a study that demonstrates the effect of framing questions, we (Fishbach & Dhar, 2005) asked participants to recall successful goal pursuits in several domains and we manipulated the representation of these successes by asking participants whether they expressed their level of goal commitment or had made progress toward their goals by pursuing them. Participants then indicated their motivation to attend to another, competing goal. For example, with regard to academic goals, student participants in the commitment frame indicated whether they felt committed to academic tasks when they studied, whereas participants in the progress frame indicated whether they felt they had made progress on their academic tasks when they studied. All participants then indicated their interest in socializing with friends that night after completing a day of studying. We found that those who answered progress questions expressed more interest in switching to the socializing goal than those who answered commitment questions; hence, they were more likely to seek a balance between positive feedback on their academic goal and attending to alternative, social goals.

Framing questions impact the meaning people imbue to past actions and thus whether they highlight the focal goal or balance between the focal goal and competing alternatives in the present. In addition, framing questions can also change the meaning of actions people plan to pursue in the future, and these planned actions will then influence present goal pursuit as a

function of the dynamic of self-regulation. To demonstrate the effect of planned, future goal actions, we (Zhang, Fishbach, & Dhar, 2007) compared goal pursuit among those who considered the meaning of future actions to their commitment versus progress toward their goal. We found that planned actions can signal commitment and competence (Bandura, 1997; Taylor & Brown, 1988; Weiner, 1979), which promote persistence towards the focal goal in the present, or they can signal upcoming progress toward goal attainment, which substitutes for present actions and encourages the pursuit of inconsistent goal actions (Oettingen & Mayer, 2002). For example, a planned workout can signal to the gym user that he is highly committed to staying in shape or that he is about to make progress toward the health goal. If the gym user infers commitment he will be inclined to exercise today, whereas if he infers progress he will be more inclined to procrastinate today. In this way, planned actions provide impactful feedback for self-regulation in the present.

***Presentation Format.*** Another factor that influences the dynamic of self-regulation and one's response to feedback is the arrangement of choice options. People often make selections from choice sets that include options that serve multiple goals. For example, people can search for movies at a store that contains educational films and light comedies, select from highbrow news magazines or lowbrow tabloids on a newsstand, or select songs from a set that includes classical or popular music. In such situations, the presence of multiple-choice alternatives activates the goals that correspond to each option (Shah & Kruglanski, 2003) and the arrangement of the alternatives influences people's perceptions of them as competing against versus complementing each other and, accordingly, their dynamic of self-regulation. For example, the presence of healthy fruits and unhealthy candies activates health versus indulgence goals, and the perceived relationship between these goals as competing versus complementary

influences the dynamic of self-regulation individuals follow across several choices (e.g., whether a person who had a piece of fruit chooses to have another piece of fruit or to have some candy subsequently).

We (Fishbach & Zhang, 2008) find that presenting choice options apart in two separate choice sets (e.g., two bowls) versus together in one choice set (e.g., one bowl) determines whether individuals perceive the choice as conflicting versus complementary. When the options are apart, they seem conflicting and thus promote a highlighting dynamic of choice: a person responds to feedback on successful goal-related choice by choosing the same goal again. However, when the options are together, they seem complementary and hence promote a balancing dynamic of choice: a person responds to feedback on successful goal pursuit by switching to another goal.

To demonstrate these effects, we (Fishbach & Zhang, 2008) gave participants a choice between a healthy bag of carrots and an unhealthy chocolate bar. Presenting the items in separate piles increased participants' likelihood of making healthy choices (taking the carrots), compared with presenting the items in a single, unsorted pile, presumably because when the items were presented separately, participants planned to choose healthily for now and later, whereas when they items were presented together, participants were planning to eat unhealthily now but healthily later. Indeed, in another study, when healthy and unhealthy menu items were presented together (i.e., on the same menu), participants chose healthy items consistently, for now and for later, whereas when menu items were presented apart, participants chose unhealthily in the present and then switch to something healthier for the next course.

***Superordinate goal.*** Whether individuals increase goal pursuit in response to positive feedback in a commitment frame, or negative feedback in a progress frame, partially depends on

their attention to the specific action or subgoal as opposed to its superordinate goal (e.g., a specific workout vs. health goals). If the superordinate goal is salient, successful performance can signal commitment to this goal more than it can provide a sense of progress, because the overall goal is far from reach. Therefore, positive feedback would increase a person's motivation to highlight the goal by pursuing consistent actions. If, however, the superordinate goal is not salient and a person focuses on the specific activity, positive feedback signals goal progress and even fulfillment, and motivates balancing by moving away from the goal.

In a study that tested the effect of superordinate goal accessibility, we (Fishbach, Zhang, & Dhar, 2006) examined when gym users choose to follow a successful workout with a healthy beverage. In order to increase the accessibility of the superordinate health goal, participants completed an experimental survey attached to either a "health and fitness" hardcover book or a phone directory. Both books served as clipboards. We provided feedback on participants' successful workouts by having them evaluate their own workouts relative to another (fictitious) participant who either exercised very little or a lot. We found that when the superordinate health goal was salient (the "health and fitness" clipboard), those who received positive feedback that they exercised more than another person expressed greater interest in getting healthy food than those who received negative feedback that they exercised less than another person. In contrast, in the absence of the superordinate goal prime, those who received negative feedback expressed greater interest to eat healthily than those who received positive feedback (see Figure 1).

Other studies (Fishbach et al., 2006) found that temporal distance has a similar impact on how people respond to feedback because temporal distance increases the focus on abstract goals (Liberman & Trope, 1998; Trope & Liberman, 2003; Vallacher & Wegner, 1987). Thus positive feedback on distant goals increases motivation to pursue the same goals in the present because it

signals a boost in commitment. In addition, negative feedback on proximal goals increases present motivation because it signals insufficient goal progress.

***Commitment level.*** Pre-existing levels of commitment to a goal also determine whether people interpret their actions as a signal of commitment or of progress and their subsequent response to feedback. People wish to evaluate their commitment when it is relatively low, and consequently, they are more likely to persist on the goal after receiving positive feedback signaling the goal is important and worthwhile. However, when goal commitment is high, people ask about their pace of progress and are more likely to persist on a goal after receiving negative feedback because negative feedback signals to the committed individuals greater discrepancy and need for progress (Wicklund & Gollwitzer, 1982). For example, in one study, participants who demonstrated pre-existing commitment to their choice of profession exhibited enhanced performance on work-related tasks when they got negative feedback – a pattern that was not observed among those not committed to their choice of profession (Brunstein & Gollwitzer, 1996).

In another series of studies that tested the impact of commitment, we (Koo & Fishbach, 2008) used goals with a clear end state to which we manipulated initial commitment (high vs. low) and participants' attention to what they had accomplished versus what remained for them to accomplish. When goals have a clear end state, any accomplishment (e.g., 50% to date) can be framed also as a lack of accomplishment (e.g., 50% to go) without altering the objective information on the level of goal attainment. The question we addressed was which feedback is more motivating: Feedback on completed or remaining actions. We found that when commitment is low, emphasizing completed actions (positive feedback) increases goal

persistence more than emphasizing remaining actions (negative feedback). An emphasis on remaining actions, in contrast, increases goal persistence when commitment is high.

For example, in one study (Koo & Fishbach, 2008), student participants reported greater motivation to study for an exam in a course they were not already committed to (e.g., a pass/fail course) if they received positive feedback on their completed actions. However, students reported greater motivation to study for an exam in a course they were highly committed to (e.g., a letter grade course) if they received negative feedback on their missing actions (see Figure 2). Thus, when commitment was low, students studied because they had completed some coursework before (positive feedback) and thus they highlighted the study goal. When commitment was high, students studied because they had remaining, uncompleted coursework (negative feedback), thus they exhibited a dynamic of balancing between past and present efforts.

Whereas research on self-regulation often concerns the pursuit of personal goals (e.g., career, academic and health goals), many goals individuals pursue are goals shared with a collection of individuals (Weldon, Jehn, & Pradhan, 1991; Zander, 1980). For example, individuals often engage in social movements with others, donate to charities, and accomplish chores with housemates. In studies that examined performance on shared goals, we tested how feedback on a group's performance influences a person's contribution to the shared goal as a function of the person's commitment or identification with the group. We found that when commitment to the shared goal is low, people invest more resources if they receive information on other group members' contributions (positive feedback) versus lack of contributions (negative feedback), because existing contributions indicate the goal is important. That is, people's actions follow (or highlight) other group members' actions. In contrast, if people are already committed

to the shared goal and wish to evaluate the group's progress, they invest more resources if they receive information on other group members' lack of (vs. existing) contributions, because lack of contributions indicates more effort is required to achieve the goal. That is, people's actions compensate (or balance) for other group members' lack of actions.

For example, in a field study, we measured contributions to a charity campaign to help AIDS orphans in Africa (Koo & Fishbach, 2008). The solicited population included regular donors who made monthly donations to this charity ("hot list") and new donors who indicated interest in donating but had not yet made any contributions ("cold list"). The two groups varied by their commitment level, which was higher for those on the hot list than the cold list. The solicitation letter indicated a goal to raise 10 million won and that approximately half of the money had already been raised through various channels. Depending on experimental condition, the letter further emphasized either accumulated or missing contributions to complete the campaign goal. We found that among the cold-list donors, emphasizing 50% accumulated contributions (positive feedback) increased contributions. This pattern reflects highlighting other group members' contributions by contributing more if others already did. In contrast, among the hot-list donors, emphasizing that 50% of contributions were missing (negative feedback) increased contributions. This pattern reflects a dynamic of balancing by using one's own contributions to make up for others' lack of contributions (see Figure 3).

In summary, research on the dynamics of self-regulation extends research on attribution theory and mood theory by identifying the conditions under which different self-regulatory processes – the ones where positive versus negative feedback increase goal adherence – are more likely. According to this line of research, positive feedback on successes promotes goal pursuit when it signals that a person is committed, including that that goal is worthwhile, enjoyable and

within reach. Negative feedback on lack of successes promotes motivation when it signals a discrepancy – that the rate of progress is insufficient. The result is a dynamic of highlighting when feedback informs one’s commitment and a dynamic of balancing when feedback informs one’s progress. In the remainder of this review, we examine the implications of research on feedback on the level of aspiration that self-regulators exhibit and to the strategic use of feedback to motivate the self and others.

## **Implications**

### ***Feedback Impacts Level of Aspiration***

We reviewed research on the impact of feedback on goal striving: the motivation to persist on a goal. In addition, feedback on goal pursuit impacts the level of performance or standards individuals aspire to achieve, that is, their level of aspiration (Lewin et al., 1944).

Exploring how individuals set their standards is particularly relevant for exploring motivation in the context of goals that follow a goal ladder, in which each goal is a step toward pursuing another, more advanced goal. For example, career paths often follow a trajectory in which an entry-level position is a step toward a more advanced position in the organization, and learning goals often follow a path from a beginner level to an intermediate level and then to an advanced level. In these goal ladders, a tradeoff exists between repeating the same level and moving forward to a more advanced level. For example, a student who completes a class can choose to take a more advanced class in the same topic (i.e., climb up the goal ladder) or repeat the same (beginner) level for another topic.

The feedback individuals receive on their present goal pursuits influences what goal level they set for themselves subsequently. Specifically, feedback on missing actions to complete the goal increases the level of aspiration more than feedback on completed actions, because it directs

individuals to focus on making progress. In contrast, feedback on completed actions increases commitment and hence, satisfaction with the present level of engagement. To illustrate these influences of feedback, in one study, we (Koo & Fishbach, 2010) asked participants to review a set of unfamiliar musical pieces. After each piece, participants received feedback on either (a) the portion of the task they had completed, (b) the portion of the task that remained, or (c) their present position in the task (e.g., “you are on #3”). We found that upon completing their evaluations, participants who received feedback on remaining, unaccomplished actions chose to advance to a higher task level more than those who received feedback on completed actions or on their current position (see Figure 4).

In another field study, we (Koo & Fishbach, 2010) examined level of aspiration among employees in an advertising agency. The employees considered either the tasks they completed that year or their upcoming tasks for that year. They then indicated whether they would like to move on to more challenging roles for the next year and how satisfied they were with their current roles in their organization. We found that when employees focused on missing (vs. completed) actions, they expressed greater interest in advancing to more demanding roles for the next year and were less satisfied with their current roles. Thus negative feedback on missing actions increased level of aspiration in the workplace whereas positive feedback on completed actions increased job satisfaction.

Overall, in a goal ladder, positive feedback that is taken as a signal of commitment promotes staying on the present level of goal engagement, whereas negative feedback that is taken as a signal to lack of progress promotes moving to a more advanced goal. This finding also has implications for research on intrinsic versus extrinsic motivation (Higgins & Trope, 1990; Kruglanski, 1975; Sansone & Harackiewicz, 1996). Feedback on completed actions appears to

increase the intrinsic incentives associated with engaging in a goal, including the experience of enjoyment, involvement, or importance, whereas feedback on remaining actions increases the extrinsic incentives associated with making progress and attaining the goal.

### ***Strategic use of Feedback***

People use feedback strategically (though not necessarily consciously) to increase their own or someone else's motivation to persist on a goal. Thus, not only do people respond to feedback but they also give and seek feedback in order to increase their and others' motivation to pursue goals. Whereas a large proportion of feedback research concerns people's responses to feedback—how it influences their subsequent motivation—we next explore the implications for feedback giving and seeking. We assume feedback providers (e.g., educators, coaches, parents, and bosses) use feedback to motivate the recipient. Additionally, feedback seekers actively solicit feedback from those around them (e.g., friends, family members, colleagues, and neighbors) in order to motivate themselves.

In general, across the three modalities of feedback—giving, receiving, and responding—a relationship exists between experience and valence of feedback: individuals shift toward negative feedback as the receiver of the feedback gains more experience or expertise in pursuing a goal. In this section, we demonstrate the shift in mastery goals, such as acquiring a new skill, as well as investing resources in relationship goals.

***Shifting in responding to feedback.*** Positive feedback is effective when it signals commitment and negative feedback is effective when it signals discrepancy. Then, as individuals gain expertise, their focus on evaluating commitment decreases and their focus on monitoring progress or discrepancy increases. The reason is that novices wish to evaluate their commitment more than experienced individuals do. As a result, the same feedback would impact the novice's

commitment but impact the expert's sense of goal progress. For example, college freshmen are more likely to ask themselves whether college is right for them, whereas college seniors are more likely to ask about the pace of their progress toward earning their degree and whether they will graduate on time. These changes imply that novices will work harder in response to positive feedback and experts will increase their efforts in response to negative feedback. For example, the freshmen would study harder after receiving positive feedback such as a good grade, and seniors would study harder after receiving negative feedback such as a bad grade.

In a study that illustrates this shift toward responding to negative feedback, Louro, Pieters and Zeelenberg (2007) explored how dieters respond to feedback on their effort to lose weight as a function of how far along they are on their diet. These researchers found that those dieters who felt good about their achievement at the beginning of their diet increased their effort more than those who were disappointed with their achievement. But later on the pattern reversed: those who felt good toward the end of their diet when they were about to meet their weight-loss goal, relaxed their dieting efforts compared with those who were less satisfied with their achievement.

***Shifting in seeking feedback.*** A similar shift toward negative feedback exists in feedback seeking: experts seek more negative feedback than novices. To illustrate this point, we (Finkelstein & Fishbach, 2010) compared feedback seeking among American college students enrolled in advanced and beginner French classes. We found that students enrolled in the beginner class were more interested than advanced students in taking class with an instructor who emphasizes what they did well (positive feedback). The advanced students, in contrast, were more interested than beginner students in taking the class with an instructor who emphasizes how they could improve (negative feedback).

In another study (Finkelstein & Fishbach, 2010), participants learned a new task (American students typing in German) and could choose between receiving feedback either on their mistakes or on their correct responses after each typing session, which was comprised of a medium-length paragraph, for up to six sessions (trials). As participants progressed through the learning sessions, they gained expertise and a larger proportion of them sought negative feedback on their mistakes (see Figure 5).

***Shifting in feedback giving.*** A shift in preference towards negative feedback also exists for feedback givers. As the recipient of the feedback advances from a novice to an expert status in a particular domain, feedback givers increase the share of negative feedback that they provide. We demonstrated this trend in a study that examined the feedback individuals give to a team member as a function of his assumed expertise (Finkelstein & Fishbach, 2010). Participants had to help their team member prepare for an important presentation by providing positive and negative feedback on his practice presentation. We found that evaluators provided more negative feedback (but not less positive feedback) when they believed their team member was experienced team member (two years in) as opposed to new to the team (two months in).

***Feedback shift in relationship goals.*** People often pursue their goals with significant others who are helpful in achieving these goals. People feel closer to significant others who are instrumental for the self's goals—that is, those who encourage the advancement of the goals—and they pull away from non-instrumental others (Fitzsimons & Fishbach, 2010; Fitzsimons & Shah, 2008). For example, people feel closer to those they believe will help them achieve their active academic and fitness goals, such as a sibling who serves as a role model, and they draw further from those who thwart these goals, such as a friend who parties all the time.

Friends also exchange feedback: relationship partners often criticize or praise one another on their investment of resources (e.g., time, thoughts, and efforts) toward various goals as well as the relationship goal. Next, we examine feedback on investment in the relationship—that is, feedback that is given by the relationship partner and refers to the person’s investment in the relationship.

The status of the relationship as new versus long standing influences the valence of the feedback friends exchange on relationship goals. Specifically, new relationship partners wish to evaluate the strength of their commitment to the relationship, and negative feedback will undermine their commitment, thereby reducing their motivation to pursue the relationship. However, as the relationship deepens, relationship partners feel more secure about their level of commitment to the relationship goal and are less concerned with the negative impact of exchanging negative feedback (i.e., relationship depth acts as a buffer; Linville, 1987; Showers & Kling, 1996; Trope & Neter, 1994). In addition, for long-standing relationship partners, negative feedback is further motivating because it implies lack of sufficient investment. Therefore, not only can long-standing relationship partners tolerate negative feedback, but the same feedback also motivates them to invest resources in the friendship.

Research demonstrated that the deeper partners perceive their relationship to be, the more likely they are to give, seek, and respond to negative feedback by increasing investment in the relationship (Fishbach & Finkelstein, 2010). In a study that demonstrates the shift in feedback giving, we manipulated participants’ perception of their relationship depth (long-standing vs. new) by asking questions about their relationship on response scales that activated different standards of evaluation. For example, participants indicated how long they have known each other on a scale where the midpoint was 2 years versus 20 years, making them feel that, by

comparison, their relationship is long-standing versus new. We then measured the feedback that participants conveyed in a toast that they wrote for their friend for an upcoming event such as a birthday party. We found that participants who felt their relationship was long standing were more likely to “roast,” that is, to criticize their partner through negative feedback, than were those who felt their relationships were new.

Other studies (Fishbach & Finkelstein, 2010) documented a similar shift in feedback seeking among relationship partners. As the relationship appeared deeper, participants sought more negative feedback from their friends. In addition, in a study that tested friends’ response to feedback, we found that the strength of the relationship influences the length of the conversation after receiving negative feedback from a friend. Participants in this study were chatting with either a new or a long-standing friend online. They started the conversation by soliciting either positive or negative feedback from their partner, and we measured the length of the conversation that followed. We found that participants who solicited negative feedback from a close friend sent more messages (i.e., had a longer conversation) than those who solicited negative feedback from a new acquaintance or those who solicited positive feedback from a new acquaintance or a close friend (see Figure 6).

To summarize, there is a shift towards negative feedback as people gain expertise or experience on their goals. This shift occurs across three modalities of feedback: seeking, giving, and responding to feedback. Notably, the shift toward negative feedback can also reflect an objective increase in the value of this feedback for the individual, because as people gain expertise, the proportion of their correct responses presumably increases and therefore, incorrect responses may provide more information. For example, the foreign language student in a beginner class might make more mistakes than the one enrolled in an advanced class, thus

feedback on mistakes will be less informative for her. However, these differences in objective level of performance cannot explain the shift in feedback if evaluators use different criteria to evaluate novices versus experts, as they often do. Furthermore, even when the informational value of positive and negative feedback is held constant, research has documented a shift toward negative feedback that is strategic and meant to motivate goal pursuit.

### **Summary and Conclusions**

Feedback on self-regulation influences individuals to persist on a goal as well as to seek change. In this chapter, we reviewed research that provides a universal answer to the direction of the impact: either positive or negative feedback increases the motivation for goal pursuit. That research finds that positive feedback increases motivation when it signals the goal is valuable and the person is able to successfully pursue it. Negative feedback, in contrast, increases motivation when it signals discrepancy with a desired end state.

It follows that whether individuals wish to evaluate their commitment (a function of value and expectancy) or their rate of progress (a function of discrepancy) will determine when positive versus negative feedback promotes goal pursuit. Accordingly, we next reviewed attribution and mood research and research on the dynamics of self-regulation, which attest that positive feedback is effective for those who wish to evaluate their commitment, and negative feedback is effective for those who wish to evaluate their pace of making progress toward a goal.

An underlying assumption in research reviewed here is that feedback is instrumental; that is, people seek and give feedback to motivate goal pursuit. Clearly, other motives also underlie feedback, such as the desire to enhance self-esteem (Tesser, 1988) or validate a person's view of herself (Swann & Read, 1981). Although we acknowledge other motives impact the valence of feedback that is exchanged, feedback is first and foremost a mechanism for self-regulation and is

a crucial element in effectively pursuing an individual's goals. Thus, our focus was not on the different motives feedback can fulfill and the possible interactions between them, but rather, on how and when feedback facilitates (or undermines) self-regulation.

This review further touches on the role of affect, including feelings, moods, and emotions, in translating feedback into action. Accumulating evidence suggests that feedback operates through the affective response it evokes (Baumeister et al., 2007; Carver & Scheier, 1998; Higgins, 1987). Specifically, feedback results in positive or negative feelings, and these affective responses motivate behavioral change. Eliminating the feelings feedback evokes or altering the meaning of those feelings would modify the impact of feedback on behavior. In addition, affect provides feedback for self-regulation when it is not the result of feedback information. Overall then, to fully realize the functions of feedback in self-regulation, researchers should integrate insights from research on the motivational, affective and cognitive systems.

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Commitment-Induced Highlighting	Progress-Induced Balancing
<p data-bbox="318 323 699 363">Questioning commitment</p> <p data-bbox="253 394 764 434">Action options are presented apart</p> <p data-bbox="315 466 703 506">Salient superordinate goal</p> <p data-bbox="375 537 643 577">Low commitment</p>	<p data-bbox="1000 323 1317 363">Questioning progress</p> <p data-bbox="883 394 1438 434">Action options are presented together</p> <p data-bbox="932 466 1390 506">Non-salient superordinate goal</p> <p data-bbox="1024 537 1292 577">High commitment</p>

*Table 1. Factors that determine the dynamic of self-regulation*

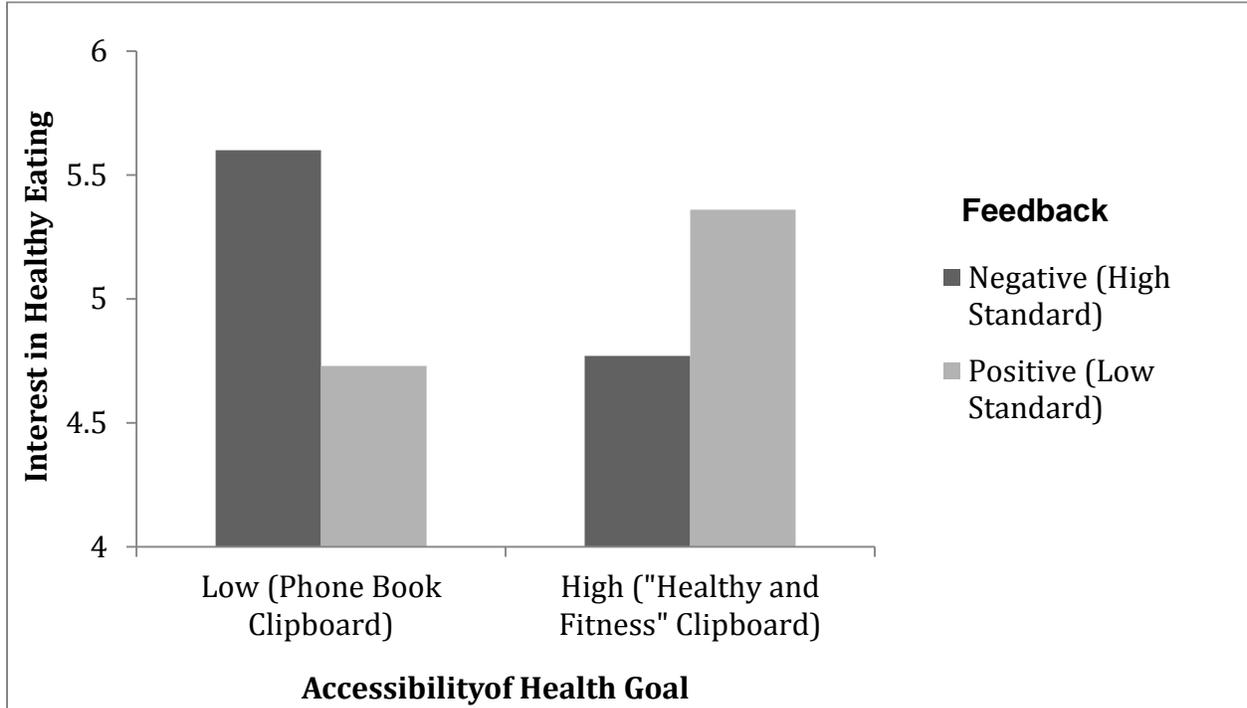


Figure 1. Interest in healthy eating as a function of accessibility of health goal and feedback (positive: comparison to a low social standard; negative: comparison to a high social standard)

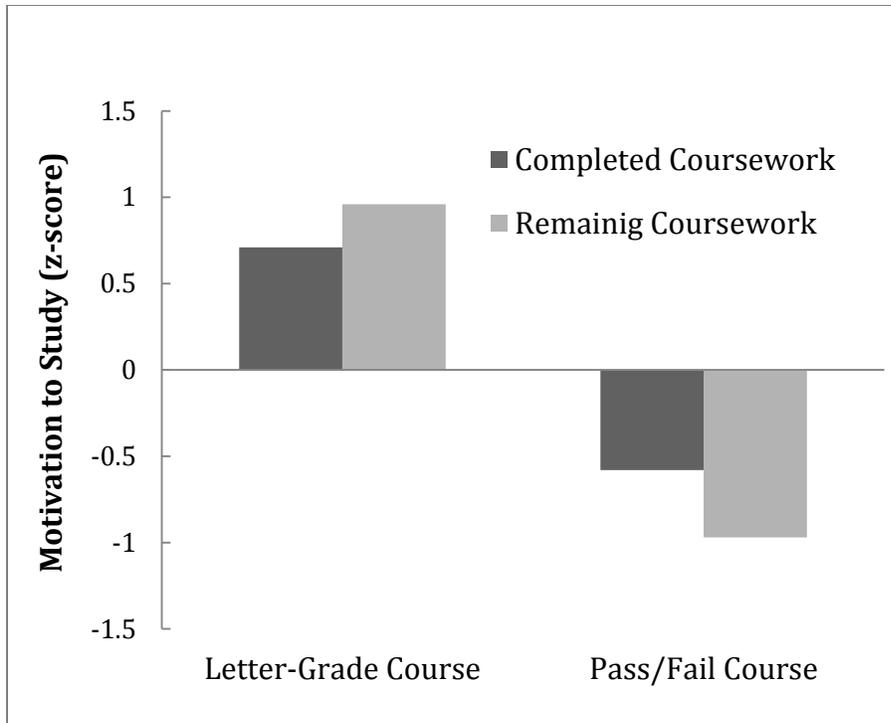


Figure 2. Motivation to study as a function of commitment (high: letter-grade course; low: pass/fail course) and focus on completed versus remaining coursework

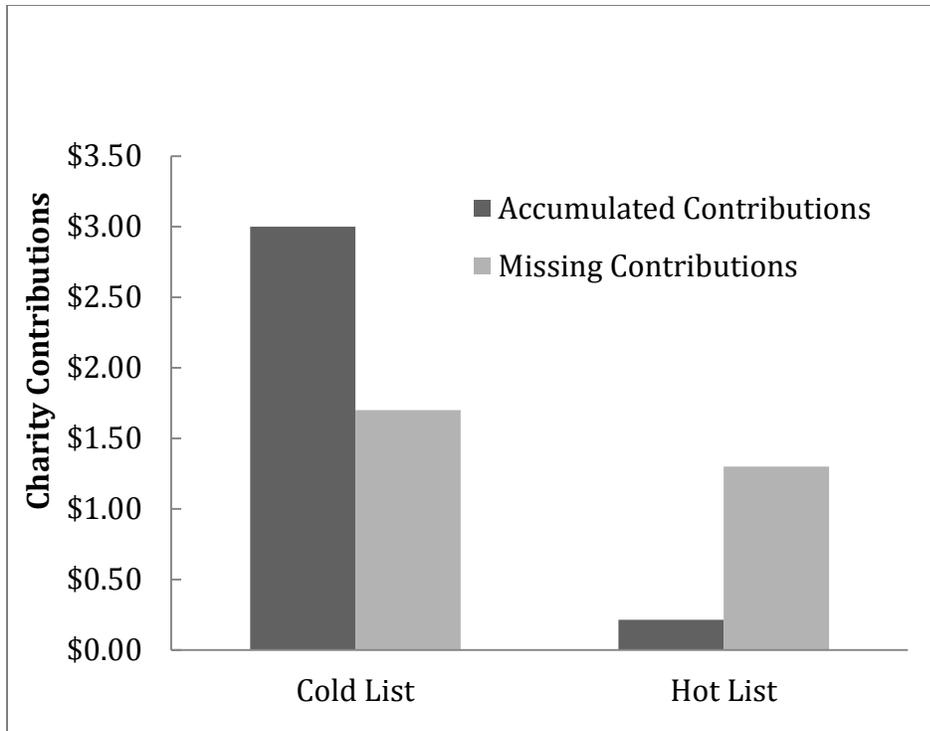


Figure 3. Charity contribution as a function of commitment (high: hot list; low: cold list) and focus on accumulated versus missing contributions

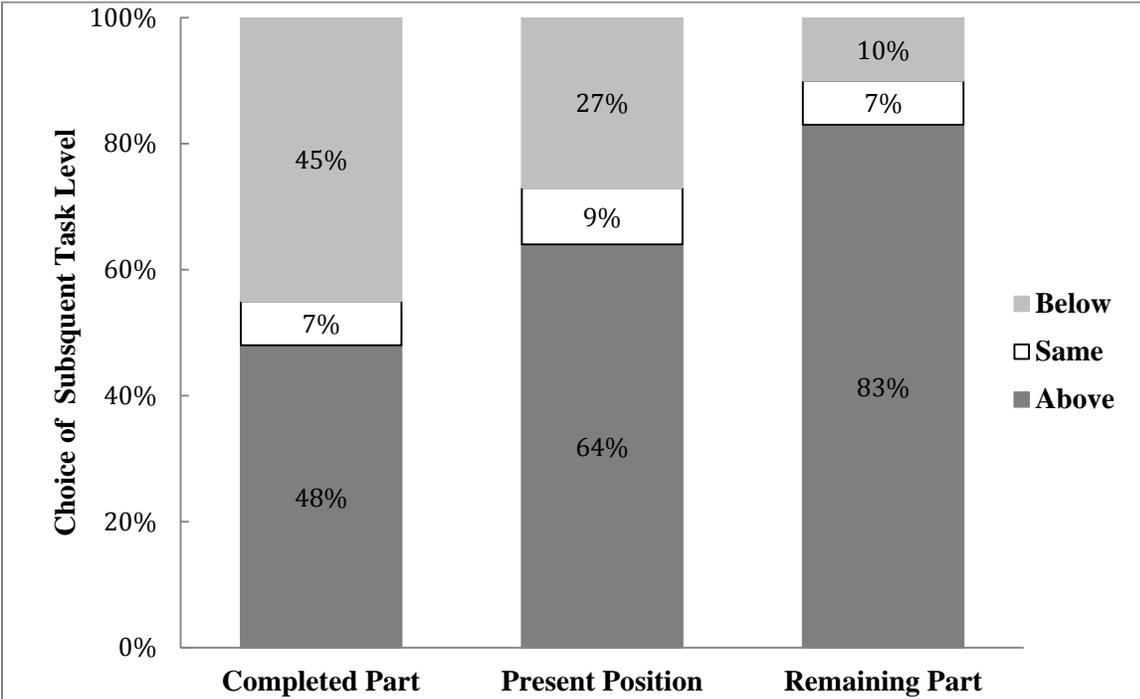


Figure 4. Choice of a subsequent task level (below, same or above) as a function of feedback on completed progress, present position, and remaining progress on present task

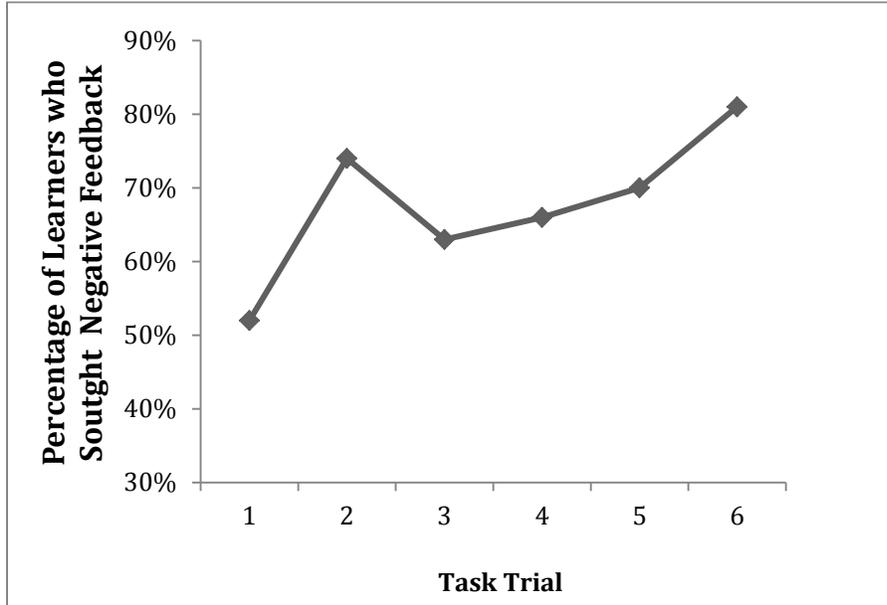


Figure 5. Proportion of learners seeking negative feedback as a function of progress on the task (i.e., gained expertise)

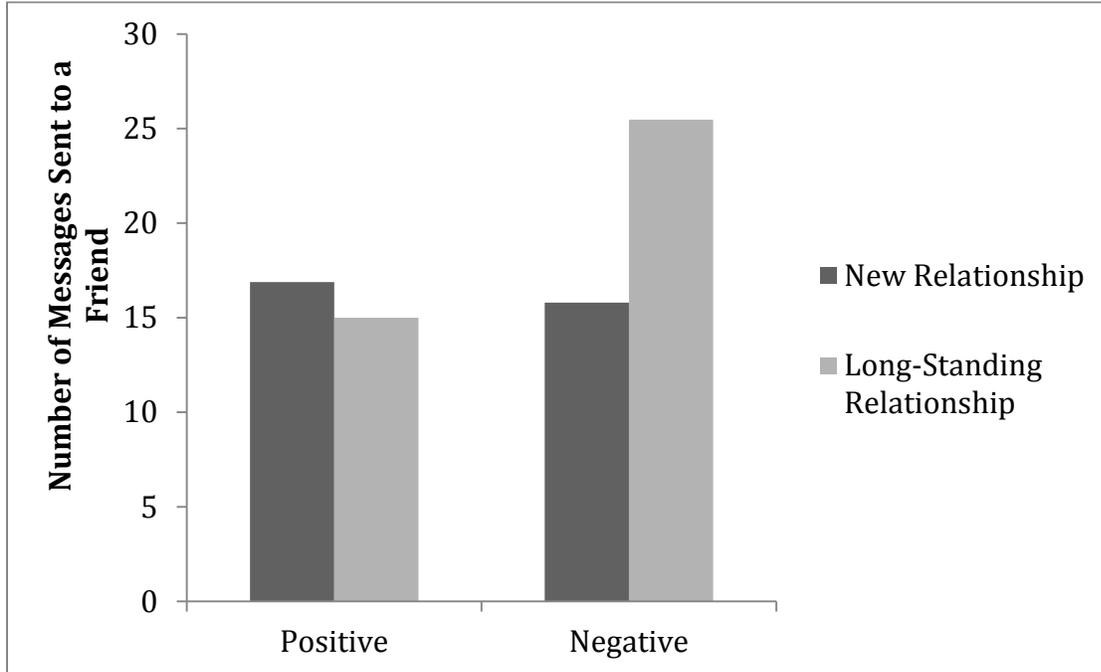


Figure 6. Motivation to invest in the relationship (# of messages sent to a friend) as a function of initial feedback (positive vs. negative) and relationship depth (new vs. long-standing)