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# Emotions Know Best: The Advantage of Emotional versus Cognitive Responses to Failure

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ABSTRACT

Making mistakes or failing at tasks is a common occurrence in human life. People can respond to and cope with failure in many ways. In this research, we examine potential advantages of relatively emotional (versus cognitive) responses to failure. In particular, we study how effort and time spent in subsequent tasks depend on whether people predominantly focus on their emotions or their cognitions as they respond to a failure. We demonstrate that, left to their own means, people's cognitions upon a failure are mainly justificatory in nature and thus do not automatically have the commonly believed reflective, self-improving qualities. We further argue and demonstrate that a relative focus on cognitions following a failure can prevent improvement in subsequent episodes, but a focus on emotions can allow for learning and, therefore, increased effort. Copyright © 2017 John Wiley & Sons, Ltd.

KEY WORDS failure; emotional response; self-protecting cognitions; learning; counterfactuals

Making mistakes or failing at tasks is ubiquitous in life. How people cope with such failure can make a big difference not only in happiness (Fredrickson & Joiner, 2002; Ryan & Deci, 2000) but also in future success (Schulz & Heckhausen, 1996). Popular belief and some literature suggest that people will be better off if they (cognitively) reflect on mistakes following a failure (Epstude & Roese, 2008; Markman & McMullen, 2003). The purpose of our investigation is to build on this earlier work and examine the possible positive role that negative emotions (i.e., *feeling* bad about a mistake) play in guiding the thought process when responding to failure. More specifically, we study the type of cognitions that are naturally evoked and aim to demonstrate that having an emotional focus might prove to be advantageous in helping people learn from their failure. We suggest that many cognitions that naturally follow failure are self-protective in nature and do not naturally allow for an improvement focus. Encouraging people to take a more emotional focus after a mistake, however, can distract from the creation of self-protecting cognitions. In turn, the emotions that are 'tagged' alongside the failure guide future actions. Thus, we propose that negative emotions might have a distinctive advantage over more cognitively focused responses.

It must, however, be noted that we are not attempting to disentangle emotive and cognitive responses that interact when experiencing an event (Lazarus, 1982; Weiner, Russell, & Lerman, 1979), such as failure. Because natural reactions to failure contain both elements, we examine the type of responses that follow a more emotional or cognitive focus. Accordingly, our exposition rests on not making the claim that people respond only with emotion or with cognition during a failure but on the types of thoughts that surface based on having a more or less emotional focus while responding to a failure and how this might promote (demote) greater effort in a subsequent decision.

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## THEORETICAL FRAMEWORK

Personal failure is an unavoidable component of life and is the subject of study in diverse literatures from aging psychology (Schulz & Heckhausen, 1996) to organizational behavior (Singh, Corner, & Pavlovich, 2007) to consumer psychology (Baumeister, 2002), just to name a few. Although ever-present, failure is sometimes thought to be dysfunctional. For instance, research on regret has demonstrated that when people make a mistake, they engage in undesirable behaviors such as avoiding otherwise good choice strategies (Ratner & Herbst, 2005) or resisting feedback that would be subsequently beneficial (Reb & Connolly, 2009). Even the anticipation of a future failure leads to dysfunctional behavior by making it difficult for people to come to a solution in a negotiation (Larrick & Boles, 1995). Failure has also been shown to stall motivation (Bandura, 1994; Pajares, 2002), cause people who are prevention focused to quit (Crowe & Higgins, 1997), or even cause negative self-perceptions (Bandura, 1991).

Although unpleasant and sometimes dysfunctional, failure can at times be useful in avoiding future mistakes (Saffrey, Summerville, & Roese, 2008). Even from an early age, children develop different strategies that either help them learn in the face of failure or inhibit their ability to move on from obstacles (Dweck, 1986). For instance, people tend to perform better on subsequent tasks if they are related to the tasks they have previously failed at (Brunstein & Gollwitzer, 1996), presumably because the prior failure allowed for learning through reflection. In a similar vein, individual differences (e.g., depression; Klein, Fencil-Morse, & Seligman, 1976 and self-esteem; Judge & Bono, 2001) also play a role in how people cope with personal failures

and whether they repeat or avoid future mistakes. Taken together, the survey of the prior literature suggests that the relationship between failure and the ensuing functional (i.e., improving on past mistakes) or dysfunctional (i.e., repeating past mistakes) behavior is a rather complex issue, with a variety of factors contributing to the effect of failure. We build on and extend this literature by identifying the emotional (versus cognitive) nature of responses to failure as an important determinant for understanding whether and when failure will lead to increased motivation for betterment over time.

When faced with a personal mistake or failure, people can employ a variety of cognitions, with possibly different implications for future behavior. Ideally, when experiencing a failure, people would have self-improving cognitions or counterfactuals that would allow them to reflect on the mistakes and identify how they might improve the next time (e.g., cognitions that aid performance and/or learning; Epstude & Roese, 2008; Markman & McMullen, 2003). These types of cognitions may occur when people realize that learning from the initial mistake is of great importance or when they are explicitly directed to cognitively reflect (Epstude & Roese, 2008; Sanna, 1998; Sanna, Chang, & Meier, 2001). Some research suggests that self-improving cognitions following a failure are more common in certain cultures, and these cognitions do indeed lead to increased effort (e.g., Japan versus the United States; Heine et al., 2001).

Although self-improving types of cognitions are possible and desirable, we argue that in everyday situations with relatively low consequences, a possibly more natural motivation is to regulate or maintain one's mood (Gross, 1998). A common way of regulating negative emotion involves using certain types of cognitions to change the appraisal (i.e., interpretation) of the situation and therefore the negative emotions that result (Gross, 1998). This self-protective motivation causes people to conjure up cognitions about the experience in order to feel better about the experienced outcome (Roese & Hur, 1997; Roese & Olson, 1997).

Such self-protecting cognitions are employed because protecting the ego from negative feedback is paramount in many situations, even at the expense of other positive outcomes (Josephs, Larrick, Steele, & Nisbett, 1992; Larrick, 1993; Mather & Carstensen, 2005; Zeelenberg & Pieters, 2007). Self-protecting cognitions can include justifications or a reevaluation of alternatives (Brehm, 1966; Festinger, 1962; Patrick, Lancellotti, & De Mello, 2009), such as producing downward counterfactuals (Sanna et al., 2001) that may result in a person appearing as though they are indifferent to their failure (in light of worse alternatives). Failures can also be externalized or the consequences downplayed (Miller, 1976; Zeelenberg & Pieters, 2007), which can even manifest in skepticism about the source of the failure (e.g., thinking that the person providing feedback is incompetent; Ditto & Boardman, 1995; Ditto & Lopez, 1992). People can also cope with failure by making statements that suggest their expectations were low in the first place (self-handicapping; Ferrari & Tice, 2000; Jones & Berglas, 1978). Importantly, these types of self-protecting cognitions are produced with the goal of emotion regulation (Gross, 1998) and can even suppress the (negative) emotional response altogether (Ochsner & Gross, 2005). Indeed, people who produce self-protecting cognitions after a failure succeed in feeling better, but they do necessarily learn from the experience (Roese, 1994). Similarly, Nikolova, Lamberton, and Haws (2016) showed that when people recall past failures (versus successes), they display indulgence instead of enhanced self-control. On the basis of this literature, we suggest that in cases where cognitive reflection is not the explicitly dictated or deemed the most important objective, the strong desire to protect oneself from negative emotion following a failure might be more dominant. Further, this relative focus on self-protecting (versus self-improving) cognitions would minimize the motivation to improve on their past failure.

Why then do some studies, mentioned earlier, show positive effects of cognitions following failure (Epstude & Roese, 2008; Markman & McMullen, 2003)? As mentioned before, in these studies, participants who had functional types of cognitions were chronically likely to produce them, externally motivated to focus on a performance or self-improvement goal, or explicitly knew that they may have a chance to redeem their actions (Epstude & Roese, 2008; Sanna, 1998; Sanna et al., 2001). We speculate that these contexts would allow most participants to realize that cognitive reflection is the greater goal. Many daily life situations, however, lack these components/contexts and thus might lead to different outcomes. We suggest that in such daily life situations, regulating emotion and protecting one's ego is the immediate goal. Accordingly, we suggest that when left to their own means, cognitions that people create upon a failure are self-protecting in nature and thus lead to decreased motivation to improve in the future.

We further suggest that an emotional focus might lead to qualitatively different outcomes. That is, focusing on negative emotions, an unavoidable and undesirable result of failures (Weiner et al., 1979), might provide the adequate motivation to improve on past mistakes. We next turn to a well-known model of emotional learning (Damasio, 1994) for insight into the possible benefits of greater (negative) emotion. According to the somatic marker hypothesis (Damasio, 1994), when an individual experiences an emotional response to an event, a neural tag is created, which is composed of the content of the experience, as well as the emotions experienced. If people later encounter a similar episode, these tags are activated to guide future behavior. Other research also supports that behavior is guided through the solutions that are stored along with the emotion (Baumeister, Vohs, DeWall, & Zhang, 2007), which can later be activated and utilized. Accordingly, we hypothesize that the negative emotions following a failure will motivate people to improve on their mistakes in subsequent episodes. That is, when the original emotional tag and stored emotional responses are activated, behavior is guided to do better (e.g., expend more effort in arriving at a decision).

We further argue that not all events are the same in their capacity to activate these stored tags. Baumeister et al. (2007) argue that the ability of the stored emotional reactions to better guide future behavior and improve on past failures stems from the activation of tags that were once stored. Much



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like any long-term memory, these tags are more likely to be triggered if the initial failure and the subsequent episode contain the same goals. Thus, we suggest that the tags created when negative emotions are experienced will be more likely to activate (and motivate to improve on these mistakes) when a similar situation, with similar goals, is encountered. However, if the subsequent task is not similar to the earlier episode, the original emotional tag and stored solutions will be less likely to be activated and, thus, less likely to shape subsequent behavior.

Past research provided initial evidence that similarities across tasks might have consequences for subsequent decisions. For instance, Brunstein and Gollwitzer (1996) showed that the relevance of the earlier failure to the latter situation is paramount in transference across contexts. More relevant to our conceptualization, Raeva, van Dijk, and Zeelenberg (2011) demonstrated that if an initial task encourages comparison across different decision outcomes, the mindset evoked carries out to later decisions in the similar domain. However, their study did not directly manipulate the similarity of the initial and the subsequent task. In the current research, we systematically manipulate such similarity across decisions, as well as the emotional versus cognitive nature of one's focus after a failure.

Putting all these components of the literature together, we predict that people who respond to failure with cognitions are more likely to engage in self-protective thoughts. Simultaneously, people who have an emotion focus upon failure will experience more negative emotions and will be better motivated to improve on their failures. However, both of these effects will be more likely to reveal themselves if the later episode encountered is similar to the instance of the failure. In sum, we hypothesize that when faced with a failure (and in the absence of explicit instructions), people engage in self-protective cognitions, which limits their improvement in future opportunities. Further, if people are encouraged to respond to failure in a more emotional manner, a subsequent task that has overlapping overall qualities will activate the original emotions and the stored solutions to help improve on the past mistake. While the emotional process will lead to improvement, the cognitive process will activate emotion regulation as a goal, leading to self-protecting cognitions and therefore a repetition of the regretted mistake. In other words, we predict that the positive effect of an emotional focus would be simultaneously driven by (i) emotional focus leading to more negative emotional thoughts and (ii) cognition focus leading to more self-protecting thoughts—both of which will then mediate the impact of response focus on search time.

In three studies, we use both manipulations of participants' experience of emotional or cognitive focus when responding to failure and study the impact of those responses on performance.

## STUDY 1

The goal of study 1 was to provide an initial test of our predictions. To that end, we directly manipulated whether participants had more emotional or cognitive responses by directly asking participants to employ different methods in responding to a failure. Additionally, we manipulated the similarity of the tasks, expecting that similar tasks will better serve as triggers of the past mistake.

We induced a sense of failure by using a sequential task paradigm. During the first part of the study, participants engaged in a task with a specific objective and were asked to complete the task to the best of their ability. The design was rigged so as to make all participants 'fail' in the first task. Participants were then instructed to focus on either the emotions or cognitions as they responded to the task outcome. Subsequently, participants completed a purportedly separate task that had a similar (or different) objective, thus manipulating high versus low task similarity. Our critical dependent variable was time participants spent on the second task. Prior research has shown that time spent is a good proxy for the amount of effort people expend when their goal is to improve upon a previous outcome (Zaichkowsky, 1986).

### Method

*Participants and design*

Ninety-eight undergraduate participants (45.9% male) completed this study for course credit. The study followed a 2 (response focus: emotional versus cognitive) × 2 (task similarity: high versus low) between-subjects design where participants were randomly assigned to one of four conditions.

*Materials and procedure*

The study was conducted over a 30-minute session (see Figure 1 for a graphical illustration of the procedure). The first part induced failure and manipulated the emotive/cognitive focus. To cause personal failure, participants completed a task with real consequences, where the outcome appeared to be under their control. In particular, they were asked to search online for a blender and report the lowest price they could find, with the possibility of winning a cash prize. The instructions were as follows:

> We would like you to search for a Cuisinart blender. The blender must be new, have at least 5 speeds, be stainless steel and have a glass pitcher. If you find a price as low or lower than the one we've found, you will win a cash prize!

The price search task was rigged, and the computer informed all participants that the lowest price was $3.27 less than what they had found. Thus, no participant found the lowest price, and all participants failed to win the $50 cash prize. We manipulated the nature of the responses to be more emotional by adapting a procedure that has been successfully used to induce an affect-rich state in previous research (Hsee & Rottenstreich, 2004). Specifically, before they learned the result of their search task, participants were asked to focus only on their emotions as they found out about the task outcome and were told that they would later write about this experience. We created a parallel version for the cognitive-laden response, asking participants to focus on their cognitions as they experience the outcome (see Appendix A for



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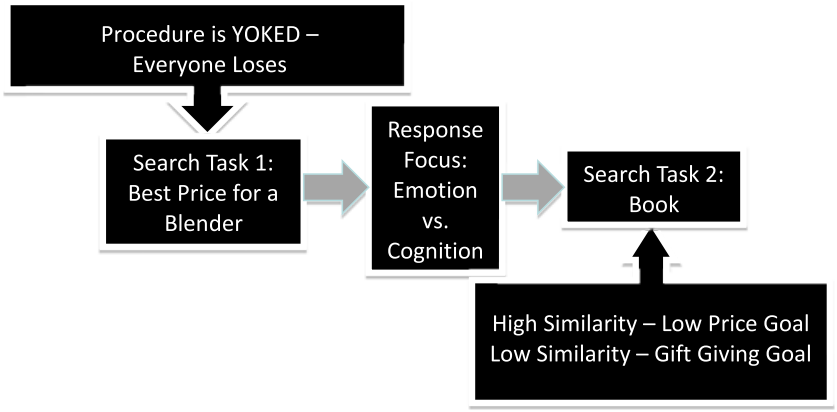


Figure 1. Study 1: search time task procedure. [Colour figure can be viewed at wileyonlinelibrary.com]

specific instructions). Next, all participants found out that they had lost the cash prize. Upon learning the outcome, participants wrote about their emotions or cognitions.

To separate the manipulation of the independent variables from the measurement of the dependent variables, participants completed 10 minutes of unrelated scales (e.g., personality scales and demographic information). Next, as part of a purportedly unrelated study, they were asked to search online for gift. Task similarity was manipulated by asking participants to search for a book that would either be the best fit for their limited college student budget (thus searching for the lowest possible price) or be the best gift for a recipient. We reasoned that having a price search task would constitute a high level of similarity with the first failed task, whereas having a different goal would be considered low similarity (see Appendix A for specific instructions). We predicted that participants who focused on their (negative) emotions during a failure would show higher motivation to obtain better results in a subsequent task that appears relevant (i.e., similar). As such, our main dependent variable was the search time in the second task, where longer time spent indicated increased effort and willingness to improve on past failure.

## Results

To test our predictions, we first examined the search time in the second task. Next, we analyzed the written protocols to gain insights into the type of cognitions participants generate under the emotion-focus and cognition-focus conditions.

### *Effort*

We find the predicted interaction between emotional/cognitive focus and task similarity to be significant ($F(1, 94) = 4.39$, $p = .04$; $\eta^2_{partial} = .05$, 95% CI: 2.61 to 97.47). The planned contrasts, which used the error term of the entire sample, showed that the predicted emotional/cognitive asymmetry is observed for the participants in the high similarity condition: When participants missed out on $50 during a price search task, a second task that involves price searching (high similarity), they exerted more effort under an emotional focus ($M = 121.88$ seconds) than under a cognitive focus ($M = 87.55$ seconds; $F(1, 94) = 4.48$, $p = .04$; $\eta^2_{partial} = .05$, 95% CI: 2.12 to 66.53). Further, when similarity between search tasks was low, there was no difference in search time between emotion-focused ($M = 93.62$ seconds) and cognitive-focused participants ($M = 109.34$ seconds; $F(1, 94) = 0.80$, $p = .38$; $\eta^2_{partial} = .01$, 95% CI: −19.11 to 50.53; see Figure 2).

### *Types of cognitions produced*

We also sought to show evidence for our proposed mechanism, whereby focusing on emotions after a failure simultaneously increases negative emotions and decreases self-protecting cognitions. To do so, two independent coders, who were blind to the conditions, rated participants' written protocols to indicate to what extent, on 9-point scales, the responses included (i) self-protecting cognitions, (ii) self-improving cognitions, and (iii) negative emotions. The items that the coders were instructed to rate (from 1 = *no mention* to 9 = *many mentions*) included whether the participants' responses claimed to not care about the outcome (corresponding to protective indifference or downplaying consequences; Miller, 1976; Zeelenberg & Pieters, 2007), revealed skepticism about the task (as a way to measure derogating the source of the failure; Ditto & Boardman, 1995; Ditto & Lopez, 1992), contained self-handicapping (Ferrari & Tice, 2000; Jones & Berglas, 1978), made excuses, or explicitly attributed the outcome to external failures

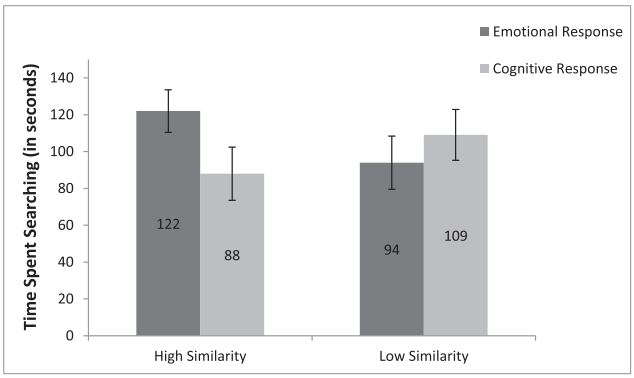


Figure 2. Study 1: effect of failure response and task similarity on search time



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(Miller, 1976; Zeelenberg & Pieters, 2007). The coders also indicated, on a 9-point scale (*not at all* to *many mentions*), the extent to which each response contained language that indicated that the participant had experienced negative emotion responses. Similarly, the coders assessed the extent to which there were any cognitions that reflected enhancement of performance or learning. All coder responses were correlated ($rs > .34$, $ps < .01$) and had Cronbach's alpha scores over .58, so we averaged their responses on each item and created the self-protection index of the five items mentioned earlier and negative emotion measure. As expected, our emotion and cognition response manipulations were successful; when comparing emotions and cognitions produced under these two initial manipulations, we find that participants in the emotion focus condition produced more emotions ($M = 2.54$) than participants in the cognition focus condition ($M = 1.78$; $t(97) = 2.95$, $p = .004$; $\eta^2_{partial} = .08$, 95% CI: 0.24 to 1.27). Similarly, under a cognitive focus, participants produced more cognitions ($M = 2.41$) than those under an emotion focus ($M = 2.10$, $t(97) = -2.08$, $p = .04$; $\eta^2_{partial} = .04$, 95% CI: −0.60 to −0.02). Specifically, within the cognitive focus condition, we also found that participants indeed generated more self-protective cognitions ($M = 2.67$) than self-improvingcognitions ($M = 1.57$; $t(48) = 3.51$, $p = .001$; $\eta^2_{partial} = .41$, 95% CI: 0.71 to 1.53).

*Role of emotions and self-protective cognitions upon failure*

We predicted that the positive effect of an emotional focus would be simultaneously driven by (i) participants in the emotional focus having more negative emotional thoughts and (ii) participants in the cognition focus condition having more self-protecting thoughts—both of which will then mediate the impact of response focus on search time. We did not expect cognitions addressing learning (self-improving cognitions) to have a direct role.

To that end, we conducted a mediation analysis using model 15 in Preacher and Hayes process (see Figure 3 for pathway), by entering self-protecting cognitions, negative emotions, and self-improving cognitions as simultaneous mediators in the relationship between the component focus (emotion versus cognition) and time spent searching in the second task, when task similarity moderates the relationship (i.e., a mediated moderation). We found that an emotional focus (cognition = 0, emotion = 1) indeed positively predicts negative emotions (β = 1.12, $p = .001$) and negatively predicts self-protective cognitions (β = −0.28, $p = .04$). Further, as predicted, negative emotion mediates the effect of response focus on search time in the second task, but only when there was high similarity between tasks (β = 9.15, 5000 samples, 95% CI: 0.90 to 29.69) and not when there was low similarity (β = 1.33, 5000 samples, 95% CI: −9.45 to 18.54). Similarly, self-protective cognitions mediate the effect of response focus on search time in the second task, but only when there was high similarity (β = −6.84, 5000 samples, 95% CI: −21.97 to −0.06) and not low similarity (β = −1.75, 5000 samples, 95% CI: −21.50 to 9.74). Self-improving cognitions did not mediate the effects in either the high similarity (β = −3.64, 5000 samples, 95% CI: 17.13 to 0.73) or low similarity case (β = 0.74, 5000 samples, 95% CI: −7.84 to 16.69).

*Replication*

Because the current study was meant as an initial test of our theory, it is important that we show that this effect holds in another data collection and with another population. Thus, we conducted a replication of this study using mTurk participants ($N = 178$; mean age: 32.6 years; 55% male). We used the exact same method and procedure as study 1 and replicated the findings by finding a statistically significant interaction between emotional/cognitive focus and task similarity ($F(1, 174) = 4.68$, $p = .03$; $\eta^2_{partial} = .03$, 95% CI: 4.17 to 91.34). We find that planned contrasts also replicated, where participants who missed out on $50 and were given the opportunity to improve on their behavior in a similar task exerted more effort under an emotional focus ($M = 98.42$ seconds) than under a cognitive focus ($M = 66.02$ seconds; $F(1, 174) = 4.39$, $p = .04$; $\eta^2_{partial} = .03$, 95% CI: 1.89 to 62.90). Further, when the search tasks were dissimilar, there was no difference in search time between emotion-focused ($M = 63.60$ seconds) and cognitive-focused participants ($M = 78.96$ seconds; $F(1, 174) = 0.95$, $p = .33$; $\eta^2_{partial} = .01$, 95% CI: −15.78 to 46.49). On the basis of these results, we feel confident that the asymmetrical effect of emotion and cognition on effort are reliable and robust.

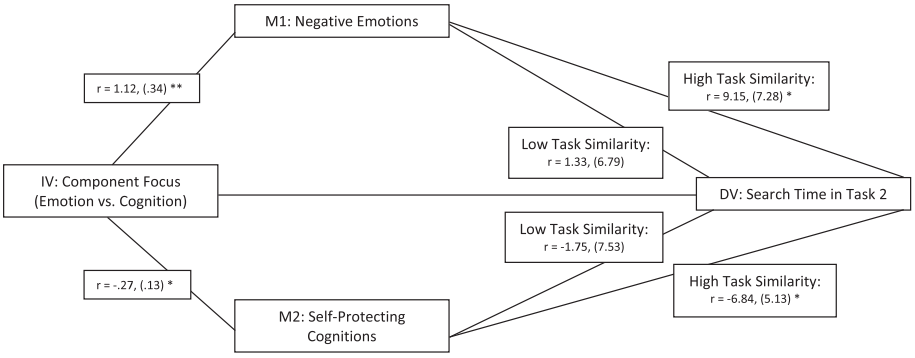


Figure 3. Study 1: mediation pathway for two mediators—negative emotions and self-protecting cognitions. *Note*: * $p < .05$, ** $p < .01$. Direct effect of IV and moderator on DV is noted in the text, but not in this graph



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**Discussion**

In this first study and a replication, we found that emotionally experienced failure better motivates increased effort, which we argue reflects the participants' desire to improve on their past behavior. We also show that this corrective advantage is unique to situations where there is sufficient similarity to the initial failure. Furthermore, the analysis of open-ended protocols suggests that when asked to reflect cognitively, people produce more self-protecting (versus self-improving) responses and that these self-protecting responses, together with increased negative emotions under an emotion focus, drive the increased effort. In this study, high task similarity was operationalized as a match between a goal to find the lowest price for a blender and a subsequent goal to find a low-priced book to give. To ensure that our task similarity factor (and its effect) is not restricted to the specific use of a price goal, in study 2, we include a second method of operationalizing similarity, namely, the match or mismatch of search tasks based on a goal of finding an option with the best reviews. We expected an interaction between emotion/cognition focus and task similarity, such that people focused on the emotional (versus cognitive) component of failure would show more corrective behavior when the two tasks have high (versus low) similarity. The same pattern of results should be obtained regardless of the task similarity manipulation (i.e., goal type) employed.

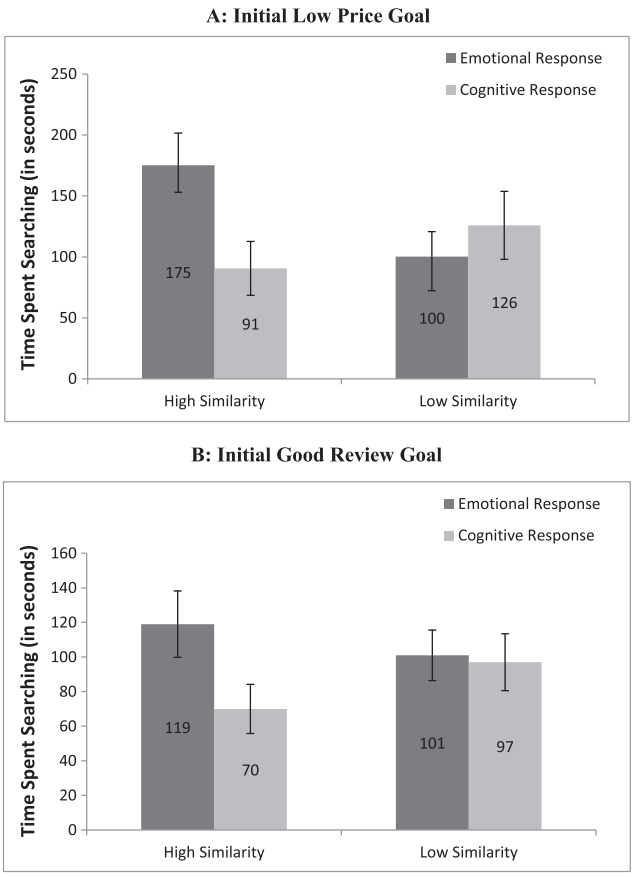


Figure 4. Study 2: effect of cognitive/emotional response and task similarity on search time

## STUDY 2

**Method**

Ninety-three undergraduates (53.8% male) completed the study in exchange for course credit. Study 2 followed a 2 (focus: emotional versus cognitive) × 2 (task similarity: high versus low) design; participants were randomly assigned to the conditions. Task similarity was operationalized as a match (high similarity) or a mismatch (low similarity) between goals (price or review) in the two search tasks. As before, the critical dependent variable was the time spent searching for the specified product during the second task. The procedure was identical to study 1 with the following exceptions. First, while one of the goals was still 'low price', we altered the second goal to be 'best rating' (as opposed to 'best gift' in study 1). Second, we manipulated the goal both during the failure experience and during the follow-up task. This allowed us to examine the situations under which goals matched (mismatched) to illustrate high (low) task similarity. We were not interested in the main effect of goals.

**Results**

*Effort*

Analyses revealed the predicted two-way interaction between response focus and task similarity to be significant ($F(1, 89) = 8.49$, $p = .005$; $\eta^2_{partial} = .09$, 95% CI: −158.51 to −30.00; see Figure 4). We unfolded this interaction using contrasts coding, including the error term of the entire sample. When task similarity was high, participants who focused on emotions after a failure exerted more effort to search (i.e., spent more time searching in the second task; $M = 144.95$ seconds) than those who focused on cognition ($M = 82.69$ seconds; $F(1, 89) = 6.81$, $p = .01$; $\eta^2_{partial} = .07$, 95% CI: 14.85 to 109.67). There were, however, no significant differences between cognition-focused participants ($M = 131.24$ seconds) and emotion-focused participants ($M = 99.25$ seconds) in search time when the task similarity was low ($F(1, 89) = 2.15$, $p = .15$; $\eta^2_{partial} = .02$, 95% CI: −11.38 to 75.37). The means reported here are across both goals, but importantly, we find the same pattern of effects for high task similarity, regardless of whether that similarity is operationalized as two consecutive tasks with a price goal or a good review goal. Figure 4 shows the pattern of effects for the price goal and good review goal separately.

*Types of cognitions produced*

We again sought to show evidence for our proposed mechanism: self-protecting cognitions and emotions. Two independent coders, blind to the conditions, rated the open-ended responses as in study 1, indicating to what extent, on 9-point scales, the participants' responses included self-protecting cognitions, self-improving cognitions, and negative emotions. Coder responses were highly correlated ($r$s $> .27$, $p$s $< .01$) and had Cronbach's alphas greater than .61, so we averaged their responses on each item and created the self-protection index, negative emotion measure, and learning cognitions measure. As in study 1, when comparing just



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the cognition and emotion conditions, there were more cognitions following the cognitive focus ($M = 2.75$) as opposed to the emotion focus ($M = 2.36$; $t(92) = -2.30$, $p = .02$; $\eta^2_{partial} = .05$, 95% CI: −0.72 to −0.05) and more negative emotions following the emotion focus ($M = 2.56$) than in the cognitive focus ($M = 1.32$; $t(92) = 3.93$, $p = .001$; $\eta^2_{partial} = .13$, 95% CI: 0.62 to 1.87). Additionally, in the cognitive focus condition, there were again more self-protecting cognitions ($M = 2.749$) than self-improving cognitions ($M = 1.45$; $t(46) = 3.51$, $p = .001$; $\eta^2_{partial} = .43$, 95% CI: 0.90 to 1.70).

*Role of emotions and cognitions upon failure*

Using the Preacher and Hayes process model (#15; see Figure 5 for pathway), we analyzed whether both the self-protecting cognitions, negative emotions, and self-improving cognitions mediated the relationship between the component focus (emotion versus cognition) and time spent searching in the second task, when task similarity moderates the relationship. We found that an emotional focus (cognition = 0, emotion = 1) indeed positively predicts negative emotions ($\beta = 0.85$, $p = .02$) and negatively predicts self-protective cognitions ($\beta = -0.25$, $p = .07$). Further, as predicted, negative emotion mediates the effect of response focus on search time in the second task, but only when there was high similarity between tasks ($\beta = 7.82$, 5000 samples, 95% CI: 0.39 to 25.49) and not when there was low similarity ($\beta = 0.38$, 5000 samples, 95% CI: −15.04 to 9.78). Similarly, self-protective cognitions mediate the effect of response focus on search time in the second task, but only when there was high similarity ($\beta = -8.13$, 5000 samples, 95% CI: −23.43 to −1.68) and not low similarity ($\beta = -4.51$, 5000 samples, 95% CI: −15.18 to 0.65). Again, self-improving cognitions did not mediate the relationship in either case (high similarity: $\beta = 0.07$, 5000 samples, 95% CI: −3.63 to 5.12; low similarity: $\beta = -1.34$, 5000 samples, 95% CI: −45.41 to 14.72).

**Discussion**

Study 2 provides a stronger test of our theory and demonstrates that our hypothesized pattern holds regardless of the goal type. Instead, what seems to be important is whether there is sufficient similarity in an important aspect of the task. Once again, we find that an emotionally, but not cognitively, focused response has the unique ability to motivate subsequent behavior to improve on earlier mistakes. This, however, only is the case if the latter task is appropriately suited for such correction to take place. Importantly, analysis of the open-ended protocols following failure showed that participants' cognitions were self-protecting in nature and played a mediating role in the effort differences observed. However, a focus on emotion (supported by more indications of negative emotion in the responses) led to more effort in the second task.

## STUDY 3

Until this point, we have shown that experiencing failure and focusing on the subsequent negative emotion leads to greater effort (longer search times) than when people focus on cognition. However, few issues remain. First, in studies 1 and 2, we instructed participants to focus either on their emotions or cognitions *before* they experienced the failure. As such, it is possible that our instructions altered the way participants experienced the failure. To address this issue, in study 3, we manipulate the response focus *after* participants experience their failure. Second, the previous studies did not include a control condition, making it difficult to conclusively claim that people naturally produce self-protecting cognitions even in the absence of instructions. To remedy this issue, study 3 introduced a baseline control condition. Third, in the studies so far, we have used time spent as a proxy for effort, implicitly assuming that increase time spent on the task indicated a motivation to expand more effort. Because prior research has demonstrated that other reasons can underlie the search for information (van Dijk & Zeelenberg, 2007), we included a new measure to capture intended effort. Finally, to increase generalizability, in this study, we used a different set of product domains and a different coding technique.

**Method**

Two hundred and thirty-nine undergraduates (55.6% male) completed the study in exchange for course credit. Study 3 followed a similar design to study 2, with the following

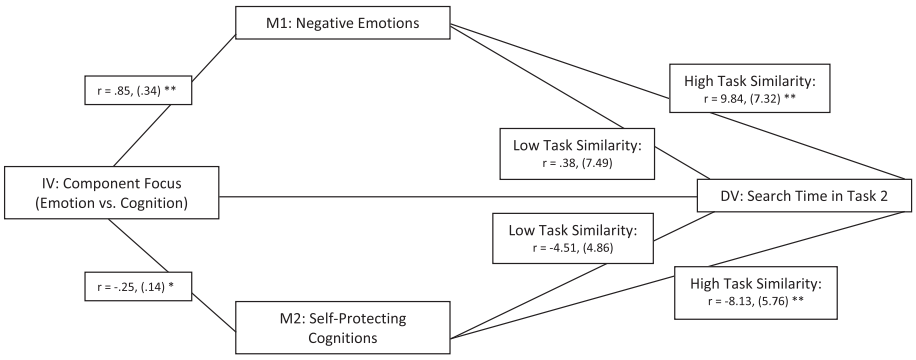


Figure 5. Study 2: mediation pathway for two mediators—negative emotions and self-protecting cognitions. *Note*: * $p < .05$; ** $p < .01$. Direct effect of IV and moderator on DV is noted in the text, but not in this graph



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changes. First, we included a baseline control. That is, participants were randomly assigned to one of three conditions, where participants received (i) instructions to focus on emotional response, (ii) instructions to focus on cognitive response, or (iii) no instructions at all. The resulting design was a 3 (focus: emotional versus cognitive versus control) × 2 (task similarity: high versus low) design. Second, instead of a blender and a home improvement book, participants in study 3 were asked to search for a humidifier in the first task and a book that helps people prepare for job interviews in the second task. Task similarity was again operationalized as a match (high similarity; search for low price in both tasks) or a mismatch (low similarity; search for a low price in the first task and a good review in the second) between goals in the two search tasks. Third, in addition to time spent searching for the specified product during the second task, we recorded another measure of effort by directly asking participants how much effort they had spent on the task (1 to 7; *not at all* to *very much*). Finally, we gave focus instructions (emotion, cognition, or control) *after* failure had already been experienced and again asked participants to write about their emotions, cognitions, or reactions in general (control condition).

We expect that the results for the emotion and cognition conditions will replicate those in the previous studies. That is, participants who focused on emotion will search longer and will report having spent more effort in a similar task than those in the cognition focus condition—despite receiving the instructions to focus on emotions/cognitions *after* they experienced the failure. Further, we expect that participants in the control condition will behave similarly to those in the cognition focus condition. This is because we theorize that people naturally produce self-protecting cognitions in failure tasks such as these. Therefore, when left to their own devices (i.e., given no instructions), participants will produce the same types of cognitions as those in the cognition condition, resulting in reduced effort in a similar task.

**Results**

Analyses revealed the predicted two-way interaction between response focus and task similarity to be significant ($F$ (2, 233) = 3.27, $p$ = .04; $\eta^2_{\text{partial}}$ = .03, 95% CI: −59.71 to −5.24). We then coded the emotion condition as 2 and cognition and control conditions as −1 to analyze the effect of emotion focus over cognition and control. When task similarity was high (i.e., the goals in the two tasks matched), participants who focused on emotions after a failure searched longer in the second task ($M$ = 64.02 seconds) than those who were in the cognition focus ($M$ = 44.11 seconds) and those in the control ($M$ = 43.01; $F$(1, 235) = 5.51, $p$ = .02) conditions. Further, participants in the cognition and control conditions did not show differences in search time when searching for low price (44.11 vs. 43.01, $p$ = .91). When task similarity was low (review condition), there were no differences between the emotion condition ($M$ = 49.89 seconds), cognition condition ($M$ = 58.85 seconds), or control condition ($M$ = 61.35 seconds; all $ps > .24$). See Figure 6 for the pattern of effects.

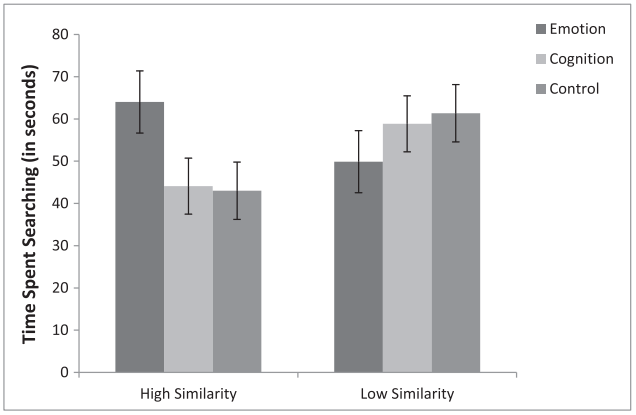


Figure 6. Study 3: search time results

We conducted the same analyses on the self-reported measure of effort. We obtained a trending two-way interaction between response focus and task similarity ($F$(2, 233) = 2.42, $p$ = .09; $\eta^2_{\text{partial}}$ = .02, 95% CI: −1.81 to 0.12) that followed a similar pattern. We again coded the emotion condition as 2 and cognition and control conditions as −1 to analyze the relative impact of emotion on effort. That is, when task similarity was high, participants in the emotion-focused condition reported that they had exerted more effort ($M$ = 4.11) than those in the cognition-focused condition ($M$ = 3.49) and those in the control condition ($M$ = 3.46, $F$(1, 235) = 4.33, $p$ = .04). There were no differences between the cognition-focused and control conditions when task similarity was high, and no differences between conditions when task similarity was low ($ps > .30$).

*Types of cognitions produced*

As in studies 1 and 2, we employed two independent coders, blind to the conditions, who analyzed participants' written protocols. However, we employed a different coding strategy to remedy a weakness in the prior analysis. Specifically, by asking coders to rate each type of self-protective thought separately (e.g., skepticism and indifference), we inadvertently created a series of missing data for participants whose written protocols did not include a particular type of self-protective thought. To remedy this, coders in this study counted participants' mentions of self-protecting cognitions, self-improving cognitions, and negative emotions. We simplified the self-protecting cognition counting task by asking coders to record the number of times a participant made *any* excuses about their failure. This could have included skepticism about the task or derogating the source of the failure (Ditto & Boardman, 1995; Ditto & Lopez, 1992), contained self-handicapping (Ferrari & Tice, 2000; Jones & Berglas, 1978), or attributing the outcome to external failures (Miller, 1976; Zeelenberg & Pieters, 2007). For the negative emotion measure, we had coders record the number of times that the participant had experienced negative emotion responses. Finally, the coders assessed the frequency of cognitions that reflected enhancement of performance or learning (i.e.,self-improving). Finally, we had the coders resolve any



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disagreement in their ratings, which resulted in an agreed-upon count for each of the measures.

Participants in this study showed unusually more variability in writing time than in the prior studies. To that end, we controlled for the length of writing. As in the preceding analyses, we coded the emotion condition as 2 and the cognition and control conditions as −1 to analyze the impact of emotion focus over the other conditions on emotions produced. Our initial manipulations were successful. Participants in the emotion focus condition produced more emotions ($M = 0.79$) than participants in the cognition focus condition ($M = 0.53$) and the control ($M = 0.43$; $F(1, 237) = 8.31$, $p = .004$; $\eta^2_{partial} = .03$, 95% CI: 0.08 to 0.43) conditions. The difference between emotions produced in the control versus cognition conditions was not significant ($t < 1$). To analyze the relative impact of the cognition condition over the emotion and control conditions on cognitions produced, we coded the cognition condition as 2 and the emotion and control conditions as −1. Under a cognitive focus, participants produced more self-protecting cognitions ($M = 0.46$) than those under an emotion focus ($M = 0.30$) and control ($M = 0.20$; $F(1, 237) = 10.93$, $p = .001$; $\eta^2_{partial} = .05$, 95% CI: 0.09 to 0.35) conditions, where the latter two did not significantly differ from each other ($t < 1$).

*Role of emotions and cognitions upon failure*

We again expected that the positive effect of an emotional focus would be simultaneously driven by the relative makeup of thoughts, containing negative emotions, self-protecting cognitions, and self-improving cognitions.

Because our coding in study 3 allowed for comparability between mediators, a mediation analysis (model 15 in Preacher and Hayes process) was conducted by entering the frequency of self-protecting cognitions, negative emotions, and self-improving cognitions as simultaneous mediators in the relationship between the component focus (cognition and control versus emotion) and time spent searching in the second task, when task similarity moderates the relationship (i.e., a mediated moderation). Because our findings and theory suggest that the relative makeup of thoughts in the control and cognitions conditions should be similar, we coded these conditions as 0 and the emotion condition as 1. We found that an emotional focus positively predicts negative emotions ($\beta = 0.29$, $p = .001$) and negatively predicts self-protective cognitions ($\beta = -0.12$, $p = .08$); there were no effects on self-improving cognitions ($\beta = -0.09$, $p = .16$). Further, negative emotion mediates the effect of response focus on search time ($\beta = 4.21$, 5000 samples, 90% CI: 0.05 to 11.94), where the relationship between negative emotion and search time was positive in the similar task condition ($\beta = 1.60$) but negative in the dissimilar task condition ($\beta = -2.62$). Self-protective cognitions mediate the effect of response focus on search time in the second task, but only when there was high similarity ($\beta = -1.51$, 5000 samples, 90% CI: −5.36 to −0.01) and not low similarity ($\beta = -1.06$, 5000 samples, 90% CI: −6.20 to 0.79). Self-improving cognitions did not mediate the effects in either condition.

**Discussion**

Study 3 again showed that focusing on emotions after a failure leads people to put in more effort, compared with those who focus on cognitions, when conducting a subsequent search task. Even without instructions, participants behaved similarly to those in the cognition focus condition, indicating that they may naturally be producing the same types of cognitions. We also ruled out any concern that our effect may be due to participants having gotten the focus instructions *before* they learned of the actual failure, as well as using different measures.

In our mediation analysis of negative emotions, we not only found that negative emotions positively predicted effort (search time) in the similar task condition, but there was some evidence that those same negative emotions negatively predicted effort in the dissimilar task condition. This finding may indicate that negative emotions are good at both steering people toward increased effort in similar tasks and steering them away from effort in dissimilar tasks. Future research could examine this possibility further.

## GENERAL DISCUSSION

In three studies, we demonstrate that responding emotionally to a failed action or decision can act as a motivator and lead to increased effort to improve on past mistakes when the situations are appropriate. Instead, relatively cognitive responses (i.e., thinking about reactions to the experience) can result in a repetition of the initial mistake. Our studies show that people's responses to daily failures often involve self-protecting thoughts, which in return inhibit improvement in the future. However, encouraging responses to be experienced emotionally increases negative emotions and decreases self-protecting thoughts—which then facilitates improvement.

Study 1 showed that people, who focused on their emotional response to not performing well during a web search task, put more effort into a subsequent search task compared with those who responded more cognitively. However, as predicted, this was only the case when the subsequent task had a cue to activate the first task; the triggering cue was operationalized as having similar goals. We also found evidence for our proposed mediators, increased self-protecting cognitions in the cognition focus condition, and increased emotional response in the emotion focus condition. Only self-protecting, and not self-improving, cognitions negatively affected search time.

Study 2 reinforced these results by focusing on the task similarity moderator and employing two different goals and showing that even for varying types of goals and tasks, emotionally responding participants searched longer than cognitively responding participants in a subsequent task that had a triggering cue present. We again confirmed the mediating role of negative emotions and self-protecting cognitions.

Finally in study 3, we manipulated the participants' emotion or cognition focus after they experienced failure, included a control condition, and added a direct measure of effort. Our results showed that those who responded relatively emotionally to failure experiences corrected their



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mistake by not only spending more time on a similar task (as in studies 1 and 2) but also reported putting forth more effort. Participants in the control and cognition focus conditions did not show (in time) or report the same effort. Mediation analysis, using frequencies of each type of thought or response, supported our predictions and theory for the results in the cognition and control versus emotion condition. The result in the control condition lends credence to our argument that people naturally produce self-producing cognitions that can inhibit learning.

Overall, we show that failure can certainly benefit the one experiencing it, but only when (i) responses are relatively emotional in nature (compared with a cognitive response) and (ii) the subsequent task has a cue to trigger the emotional tag created in the first task, activating the experienced emotion. Importantly, we also show that left to their own means, the cognitions people have, after a failure, are self-protecting (and not self-improving) in nature. Further, these self-protecting cognitions are responsible for why an emotional focus response to failure leads to more functional behavior.

To our knowledge, our research is one of the few that examines both the emotional and cognitive responses to failure and shows an isolated and functional effect of emotional responses and a specific type of cognition on later behaviors. An important exception is Ratner and Herbst (2005), who actually find that focusing on cognitions leads to *more* functional behavior. However, in that research, the cognitions involved are thoughts about strategies that have worked in the past and therefore consciously guide people in a more functional direction (versus ignoring past successful strategies and simply trying to avoid negative emotion). Our research employs the types of cognitions that naturally occur to help people mitigate currently felt negative emotion (e.g., 'It's not that big of a deal'); these cognitions, when stored, are what lead to the dysfunctional behavior noted in this paper.

Further, we show that corrective behavior stemming from failure does not always manifest in avoidance behavior. Our studies find that stronger emotional responses lead to more effort (i.e., increased search time). Our findings are somewhat unique in showing that failure, in general, can be beneficial when an individual actually allows themselves to respond emotionally.

Our results show that although failure is often dealt with through cognitive responses, emotional responses might have *desirable* consequences, improving on past mistakes if the following tasks are relatively similar. Recent work by Shallcross, Troy, Boland, and Mauss (2010) has highlighted the beneficial effects of negative emotion, specifically, accepting negative emotion experiences on people's well-being. The present findings concerning the benefits of negative emotions are consistent with this work in suggesting that the emotions resulting from people's negative life experiences can indeed be helpful and cognitive reflection can be hurtful.

As mentioned, emotional responses are expected to make a difference when a triggering cue in the current environment activates the initial failure event. Therefore, when the subsequent task or product contains a cue to trigger the failure episode, behavior is guided by the stored emotions and cognitions. Tasks that lack this cue do not activate these tags and thus do not play a role in guiding later decisions and behaviors. Further research should examine whether this behavioral change would affect future, predicted behavior (Meyvis, Ratner, & Levav, 2010).

Finally, by using experienced, as opposed to predicted or hypothetical, failure and directly or indirectly manipulating the emotional versus cognitive responses, we are able to understand the differential effects of the emotional and cognitive responses to failure. We find evidence to support the hypothesis that the emotional responses affect behavior differently than naturally occurring self-protective cognitive responses, not just a stronger or weaker impact. Specifically, emotional responses guide behavior only when a subsequent task has some way to trigger the first. Commonly experienced cognitive responses, which are meant to protect the self, do not appear to have this same learning advantage. Our research implies that, even given the same mistake, people who tend to *feel* very badly about their mistakes could be better off in the long run because it pushes them to put in the effort that remedies other relevant, but not irrelevant, situations and allows them to avoid the kinds of 'cognitive override' that prevent learning. Overall, it seems that it is not what happens in life, it is how you respond to it.

## APPENDIX A: STUDY 1 INSTRUCTIONS FOR FAILURE RESPONSE MANIPULATION

**Emotional response condition**

Important!

On the following page, you will find out if you won or lost the low-price prize. We are interested in your emotional responses to these types of highs or lows. So, following the win or loss we will ask you to write about your *emotional responses* (e.g., the mix of emotions you may have felt, the intensity, etc.). Please ONLY focus on these types of feelings.

**Cognitive response condition**

Important!

On the following page, you will find out if you won or lost the low-price prize. We are interested in your thought responses to these types of highs or lows. So, following the win or loss we will ask you to write about your *objective thoughts* about the task and the outcome (e.g., how things might have turned out differently, reasons you won or lost, etc.). Please ONLY focus on these types of thoughts.

## APPENDIX B: STUDY 1 INSTRUCTIONS FOR SEARCH IN SECOND TASK

**Low Task Similarity Instructions**

"Gift Giving Study



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In this study, we are interested in how people search for and give gifts.

Imagine that you are buying a gift for a friend who is purchasing their first house. You decide that a book on do-it-yourself projects and house repair or design would be a good choice for this friend. Based on your research, a decent book of this type sells for $15–$50.

Of course, being a good friend, you want to find the most appropriate gift (i.e., the one your friend would like the best) *within the $15–$50 range*."

**High Task Similarity Instructions**

"Gift Giving Study

In this study, we are interested in how people search for and give gifts.

Imagine that you are buying a gift for a friend who is purchasing their first house. You decide that a book on do-it-yourself projects and house repair or design would be a good choice for this friend. Based on your research, a decent book of this type sells for $15–$50.

Of course, being a college student, you are very price sensitive and want to spend the *least* amount possible *within the $15–$50 range*."

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**Noelle Nelson's** research focuses on human memory and cognition, including the impact of capacity limits on information retained and rate of satiation. Dr. Nelson also studies the effect of visual design (e.g., logos) on consumer decision making and behavior. Another stream of research addresses the role negative emotions play in consumer learning.

**Selin Malkoc's** research focuses on consumer behavior, with an emphasis on intertemporal matters. Specifically, her research examines how consumers make decisions where the outcomes are spread over time and how they perceive and consume their time. She has explored why consumers might show impatience despite good intentions and proposed several mechanisms that can help consumers make better decisions.

**Baba Shiv's** research expertise is in the area of neuroeconomics, with specific emphasis on the role of neural structures related to emotion and motivation in shaping decisions and experiences. His recent work examines the interplay of the brain's "liking" and "wanting" systems and its implications for marketing, innovation, leadership, and decision making.

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