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Bracing for Loss

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People find unexpected bad news aversive and often brace themselves by predicting the worst. Three experiments examined whether the pessimism is influenced by personal need. Students who differed in financial need learned that a billing error meant that some students would receive an additional bill from their university. Financially needy students were consistently pessimistic in predicting their likelihood of receiving a bill, whereas non-needy students were not. In addition, the experiments reveal that (a) the pessimism occurred for potential losses but not potential gains, (b) needy students were pessimistic about their own chances but not the chances of a friend, (c) the pessimism was not attributable to needy students' being more readily primed by the news of a possible bill or to needy students' having more experience with billing errors, and (d) the pessimism was specific to monetary losses and did not generalize to other events.

The American way of life is replete with encouragement to be optimistic. Many parents raise their children to see the glass as half full and to recognize that every cloud has a silver lining. Magazines and television offer feature stories illustrating how determination can turn poverty into riches. Everywhere from "Pollyanna" to "The Little Engine That Could" people are surrounded by support for the value of perseverance and a positive outlook. However, despite their efforts to do so, people do not always look on the bright side; their optimism can fluctuate from one event to the next. The present research examines how personal circumstances such as priorities, desires, and needs moderate personal predictions. Specifically, we examine the extent to which personal need in a particular domain can affect estimates of the likelihood that one will experience a loss or fail to have his or her needs met in that domain. We propose that people who have high needs within a particular domain will be more pessimistic in anticipation of possible bad news.

Optimism Versus Pessimism in Personal Predictions

In general, people display considerable bias in their predictions about future events and outcomes, believing that they are more likely than others to experience positive events and less likely than others to experience negative events (Weinstein, 1980). Researchers document an "optimistic bias" for a variety of events including lung cancer (Lee, 1989; McKenna, Warburton, & Winwood, 1993), unplanned pregnancy (Burger & Burns, 1988; Whitley & Hern, 1991), criminal victimization (Perloff & Fetzer, 1986), illness (Kulik & Mahler, 1987; Linville, Fischer, & Fischhoff, 1993; Weinstein, 1980, 1982, 1987), and automobile accidents (Robertson, 1977; McKenna et al., 1993). The optimism in personal predictions may arise from errors in the way people process information (Weinstein, 1980) or may be motivated by self-enhancement needs (see Perloff, 1987 for a review). Whatever the source, the optimistic bias seems remarkably pervasive and resistant to change (Weinstein & Klein, 1995).

It is easy to be optimistic when there is no evidence of personal vulnerability or hint that misfortune might wait around the corner. Thus, a smoker who experiences no symptoms for smoking-related illnesses and is young and thus unlikely to experience smoking-related health problems in the near future is free to be quite optimistic in predicting his or her chances of being diagnosed with, for example, emphysema. But what happens when optimistic beliefs are put to the test? Some evidence suggests that people will forsake their optimism, displaying realism or even pessimism, if they anticipate that information or feedback might soon challenge their optimistic outlook. For example, participants in one study predicted their performance on an anagram test that was scheduled immediately or in four weeks (Nisan, 1972). Participants who anticipated an immediate test estimated a lower score than did participants who anticipated the test in four weeks (Nisan, 1972; see also Gilovich, Kerr, & Medvec, 1993; Shepperd et al., 1996). In another study, college sophomores, juniors, and seniors twice estimated the starting salary of their first postgraduate job: once at the beginning of the spring term, and again at the end of the term, two weeks prior to graduation for the seniors. Only seniors estimated a lower salary at the end of the term. Moreover, the lower estimates were made only by seniors who were looking for jobs immediately after graduation (Shepperd et al., 1996, Experiment 1).

The decline in optimism when people anticipate information or feedback about their outcomes likely reflects an attempt to brace for unpleasant surprises, presumably to avoid disappointment (Shepperd et al., 1996; Taylor & Shepperd, 1998). Past research indicates that how people feel about an outcome is determined in part by expectations about the outcome (Shepperd & McNulty, 1998). Most notably, negative outcomes are more aversive if they are unexpected than if they are expected. Accordingly, as the possibility of an undesirable outcome approaches, people prefer to

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prepare for possible disappointment rather than receive the bad news as a shock.

Event Severity

People are not pessimistic for all events for which they anticipate feedback. People seem most inclined toward pessimism when they anticipate feedback about an event with severe consequences. If the consequences are mild or negligible, people tend to maintain their optimism. For example, participants in a study by Taylor and Shepperd (1998) estimated their likelihood of testing positive for a medical condition that had either mild or severe consequences. Participants who anticipated receiving their test results were less optimistic when the consequences of the condition were relatively severe than when the consequences were relatively benign (Taylor & Shepperd, 1998). Greater pessimism for severe events likely reflects acknowledgment that severe events are threatening and can impose dramatic life changes. Moreover, these events are likely to be regarded as particularly upsetting if they are unexpected.

The distinction we make for severity is similar to distinctions other researchers have made for other related psychological constructs, such as event relevance and importance. For example, according to the self-evaluation maintenance model (Tesser, 1988), event relevance is a key factor in the self-evaluation process. People feel worse following an unfavorable social comparison if the comparison dimension is highly relevant to identity than if the dimension is less relevant. Other research finds that people are more likely to self-handicap in anticipation of an important task than an unimportant task (Shepperd & Arkin, 1989). The consistent theme across these various lines of research is that events that are consequential for a person can moderate the person's judgments and behaviors.

Of course, not all people view the same outcome as equally severe in its consequences. People attach different values to outcomes based on their priorities, desires, and needs. It is likely that these personal circumstances strongly influence the extent to which people are threatened or impacted by a particular outcome. For example, while a low grade in a course might be devastating to one student, it might represent only a minor annoyance or inconvenience to another. Presumably, the student who needs or values a high grade in the class will be more likely to brace in anticipation of feedback than the student who regards the grade as relatively inconsequential. Thus, we would anticipate individual differences in the extent to which people brace for a particular outcome, and that these differences will parallel the value they place on the outcome, or the extent to which they view the outcome as consequential. One purpose of the present research was to examine this possibility.

Predictions for Losses Versus Gains

Predictions about the likelihood of a particular event may also vary as a function of the extent to which the event involves a loss versus a gain. Kahneman and Tversky (1984) coined the term "loss aversion" to describe people's unwillingness to part with their assets. This effect, also labeled the "status quo bias" (Simonson & Tversky, 1992), is the tendency for a loss of a given magnitude to seem more aversive than a gain of the same magnitude seems attractive. In addition, individuals are much more motivated to avoid a loss than they are to incur a gain of the same value (Taylor, 1991). People are typically happier to remain in their current state than to risk any of their assets, even if the potential payoff is much larger than the amount risked (Kahneman & Tversky, 1984).

Evidence for this asymmetry in perceptions of the value of gains and losses is provided in several studies (Kahneman & Tversky, 1984). For example, McCusker and Carnevale (1995) found that people are more willing to refrain from maximizing their own gains in a "tragedy of the commons" problem (which focuses on acquiring resources) than to sacrifice any assets on a "public goods" problem (which focuses on parting with resources). Apparently, individuals are more willing to forego a gain than they are to incur a loss. Similarly, in a study by Shelley (1994), managers reported that they weigh losses more heavily than gains when making business decisions, thereby showing a bias toward loss avoidance. Shelley (1994) speculates that this loss aversion may stem partly from managers dreading hazards more than they desire gains.

One explanation for the inequality between gains and losses comes from cardinal utility theory (Bernoulli, 1738/1954). According to cardinal utility theory, money is of extreme value only until one has successfully met all basic needs. After this point, the need for additional wealth drops significantly. Therefore, an individual who is comfortably meeting all basic needs may not be strongly motivated to acquire additional wealth. However, a loss of wealth could translate to a decrease in comfort and a failure to meet basic needs. Thus, a loss could be a dismaying prospect.

In sum, research on loss aversion suggests that the tendency to display pessimism in anticipation of news about one's outcomes will occur for events that represent losses but not events that represent gains. That is, people (particularly those who stand to be most affected by virtue of their personal circumstances) will brace when they anticipate possible bad news, but not when they anticipate possible good news. For example, people who are poor should be pessimistic when facing the prospect of receiving an unexpected bill, but not when facing the prospect of receiving an unexpected reimbursement. A second purpose of the present research was to examine whether people respond differently to gains and losses.

Why Are People Pessimistic?

We propose that the pessimism of people who are particularly invested in an outcome represents an attempt to brace for the worst. According to the bracing hypothesis (Shepperd et al., 1996; Taylor & Shepperd, 1998), bad news is particularly aversive when unexpected (Shepperd & McNulty, 1998). People predict the worst as news or feedback about their outcomes nears in order to avoid unpleasant surprises.

Our theoretical explanation for pessimism has parallels in several other lines of research. For example, Hobfoll (1989) argues that people are threatened and experience stress in response to the actual or potential loss of resources or the failure to realize gains after an investment of resources. Accordingly, the anticipation of news about an event is threatening to the extent that it may convey news of a potential loss of resources (e.g., loss of good health, others' esteem or affection, access to graduate school, money). Likewise, research on defensive pessimism suggests that the grim

predictions of defensive pessimists, in addition to mobilizing energy toward avoiding the bad event, helps them prepare for the bad event should it occur (Showers & Ruben, 1990). We propose that anticipatory pessimism is not limited to defensive pessimists, but extends to anyone anticipating potentially bad news regarding an event that is important or that has serious personal consequences.

We can think of at least three other reasons why people might display pessimism in anticipation of feedback. First, it is possible that pessimism in anticipation of feedback represents a response to memories of past unexpected negative events triggered by situational cues. That is, learning about the possibility of receiving an unexpected bill may prime memories of past related negative events, which in turn lead people to estimate a loss as more likely. Moreover, people for whom an outcome is particularly important may be more sensitive or responsive to primes because instances of past relevant negative events were more impactful and thus more memorable. For example, people who are financially needy may be more pessimistic than people who are non-needy in the face of a possible bill, because available cues prime a flood of memories of past instances of financial losses or setbacks, and these memories bias their estimates.

Second, people who display pessimism in anticipation of feedback may have more prior experience with the event and thus legitimately perceive themselves as being at greater risk. For example, people who live in tornado zones likely have had prior experience with tornadoes and recognize that they are at greater risk for experiencing a tornado than are people who do not live in tornado zones. The apparent pessimism thus represents a logical assessment of their greater risk rather than any attempt to brace for the worst.

Finally, it is possible that the greater pessimism of some people represents a dispositional pattern of judgments about future outcomes and not a response specific to their particular priorities, interests, or needs. For example, poor people may be relatively more pessimistic than financially comfortable people for all sorts of events and not just financial losses. In short, greater pessimism may occur among some people because of a dispositional tendency to be less optimistically biased.

In sum, people who are pessimistic in anticipation of feedback may be pessimistic for reasons other than bracing. They may be more readily primed by news of a possible loss, they may have more prior experience with the event, or they may be dispositionally inclined toward being less optimistic in general. A third purpose of the present research was to examine these alternative explanations for pessimism in anticipation of a loss.

The Present Research

We present three experiments examining the extent to which personal circumstances influence predictions in anticipation of feedback. Although there are a variety of needs or values that could provide a useful forum for examining the effect of anticipated loss on personal predictions, we chose to focus on financial need because of its broad generalizability. Experiment 1 concentrated on establishing a paradigm for studying the effect of individual differences in financial need on personal predictions and on examining possible moderators of pessimism in anticipation of news about one's outcomes. Specifically, Experiment 1 examined whether financially needy students are more pessimistic about a possible bill than are non-needy students, and whether their pessimism applies to gains and losses alike. Experiment 2 examined whether the pessimism of needy students generalizes to a friend or is limited to personal predictions. Experiment 2 also examined whether the greater pessimism in anticipation of feedback, rather than reflecting an attempt to brace for potential future bad news, results from greater prior experience with billing problems or from the news of a possible bill priming greater thinking about past unexpected financial losses.

Experiments 2 and 3 examined whether pessimistic predictions are associated with greater anxiety. Prior research reveals that pessimism is associated with greater anxiety. For example, Taylor and Shepperd (1998) found that the more anxious participants were, the more they believed they would test positive for a serious medical condition. Similarly, Shepperd et al. (1996) found that the most common reason people gave for becoming pessimistic in their estimates of their exam performance just prior to receiving feedback was nervousness or anxiety. Shepperd et al. (1996) propose that the prospect of disappointment produces anxiety and that anxiety leads people to be less optimistic. Although we did not directly manipulate anxiety in the present study, we assessed participants' anxiety just prior to when they made their estimates, thereby permitting an examination of the relationship between anxiety and participants' estimates. We predicted that participants' personal predictions would correspond to their anxiety. Specifically, people who were most anxious would be most pessimistic in their predictions of receiving a bill.

Finally, Experiment 3 examined whether the pessimistic predictions of needy students represent a generalized tendency to be pessimistic for all personally relevant events or only for events on which they anticipate feedback.

Experiment 1

Overview

Experiment 1 applied the theoretical principles of loss aversion to research on the bracing process. Specifically, Experiment 1 examined the prospect of a financial loss versus a financial gain among participants who were high or low in financial need. The greater negative affect associated with experiencing a loss than with failing to incur a gain led us to predict that people would be more pessimistic in predicting a possible financial loss (an unexpected bill) than in predicting a financial gain (an unexpected reimbursement). Moreover, we predicted that the effect would be due to greater pessimism on the part of students who were financially needy and for whom a bill would be particularly consequential.

Method

Participants. Seventy-eight undergraduate psychology students (31 male, 47 female) participated voluntarily as part of a class and were randomly assigned to the gain and loss conditions.

Procedure. Participants received a questionnaire explaining that a recently discovered registrar's error had resulted in a billing error in fall tuition and fees for 25% of the student body. Participants in the *gain* condition learned that students affected by this error would receive a $78 reimbursement in three weeks; participants in the *loss* condition learned that affected students would receive a $78 bill in three weeks.

Participants' estimates were assessed with two items. The first item asked participants to use a 0 to 100% scale to estimate the probability that they would receive a bill (in the loss condition) or reimbursement (in the gain condition). The second item asked participants the likelihood that they were one of the students who was underbilled (overbilled; 1 = *unlikely;* 11 = *likely*).

Participants also completed five items assessing financial need. Specifically, participants indicated (a) the extent to which they were on a tight financial budget (1 = *not on a tight budget;* 11 = *extremely tight budget*), (b) how much difficulty they had making financial ends meet (1 = *extreme difficulty;* 11 = *no difficulty*), (c) how much the bill/reimbursement would impact their lives (1 = *little impact;* 11 = *great impact*), (d) what effect a bill/reimbursement would have on their finances (1 = *little effect;* 11 = *great effect*), and (e) the extent a bill/reimbursement would affect their budget (1 = *not at all;* 11 = *a great deal*). These five items were summed, after reverse coding item b, to form a single index with a potential range of 5 to 55 (M = 25.7, SD = 12.1; Cronbach's α = .89).

Finally, participants completed two items assessing the effectiveness of the gain-loss manipulation. Specifically, participants reported the extent to which a bill (reimbursement) from the registrar would be desirable (1 = *undesirable;* 11 = *desirable*) and make them happy (1 = *unhappy;* 11 = *happy*). When all participants had completed the questionnaire, they were thoroughly debriefed. Because participants in Experiment 1 as well as the other experiments found the news of a billing error quite believable, we took great care to dispel the deception, to explain the real purpose of the study, and to inform participants why deception was necessary.

Results and Discussion

Manipulation checks. The gain-loss manipulation was quite successful. Participants in the gain condition (M = 5.98, SD = 2.90) were more likely than participants in the loss condition (M = 2.73, SD = 1.92) to rate the event as desirable, $t(78) = 5.90$, $p < .0001$, $\eta^2 = .31$. Likewise, participants in the gain condition (M = 5.48, SD = 2.80) were more likely than participants in the loss condition (M = 2.73, SD = 1.92) to report that the event would make them happy, $t(78) = 4.60$, $p < .0001$, $\eta^2 = .21$.

Likelihood and probability estimates. Were financially needy students more pessimistic in their estimates for a possible loss? Figure 1 presents probability estimates of financially needy and non-needy participants in the gain and loss conditions (the likelihood estimates produced virtually identical findings). For illustration purposes, scores are plotted for points one standard deviation above and below the mean financial need score using procedures recommended by Aiken and West (1991). As evident in the figure, participants in the gain condition provided similar estimates regardless of financial need. By contrast, participants in the loss condition were more pessimistic when financial need was high than when financial need was low.

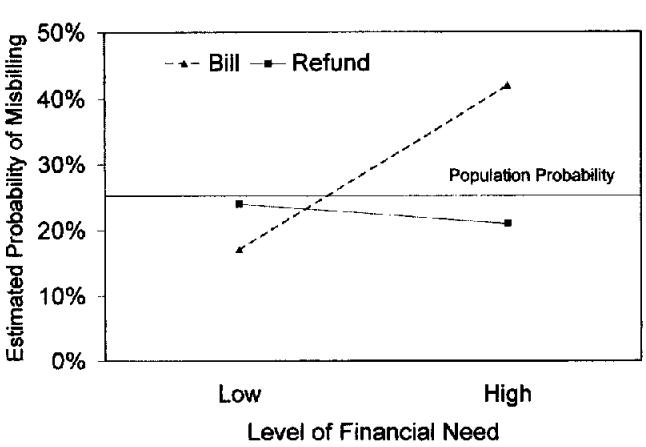

Figure 1. Probability estimates in Experiment 1.

We examined the likelihood and probability estimates statistically using simultaneous multiple regression procedures in which Need (after centering), Event Type, and the Need by Event Type interaction were entered as predictors. Analysis of the likelihood estimates revealed a significant main effect of Need, $F(1, 74) = 4.37$, $p < .05$, $\eta^2 = .06$, qualified by a significant interaction of Need and Event Type, $F(1, 74) = 7.02$, $p < .01$, $\eta^2 = .09$. Participants in the gain condition did not differ in their likelihood estimates regardless of financial need, $t(38) = 0.35$, $p > .72$, $b = -0.01$, $\eta^2 = .00$. By contrast, participants in the loss condition were more pessimistic when they were financially needy than when they were non-needy, $t(35) = 3.88$, $p < .001$, $b = 0.09$, $\eta^2 = .25$.

The same results emerged for the probability estimates. Regression analysis revealed a significant main effect of Need, $F(1, 74) = 8.99$, $p < .01$, $\eta^2 = .11$, qualified by a significant interaction of Need and Event Type, $F(1, 74) = 5.31$, $p < .05$, $\eta^2 = .07$. Examination of the regression coefficients separately for gain and loss conditions revealed that participants in the gain condition provided similar estimates regardless of financial need, $t(38) = 0.45$, $p > .65$, $b = -0.13$, $\eta^2 = .01$. By contrast, participants in the loss condition were more pessimistic if they were financially needy than if they were non-needy, $t(35) = 4.12$, $p < .001$, $b = -1.03$, $\eta^2 = .43$.

For illustration purposes, we separated needy and non-needy participants using a median split and compared their probability estimates using dependent t tests to the 25% base rate mentioned to participants in the introduction of the questionnaire. The results of the t tests were consistent with what is visually apparent in Figure 1. Only needy students anticipating a possible bill differed from the 25% base rate in their probability judgments, $t(17) = 1.67$, $p < .06$, one-tailed, $\eta^2 = .14$. All other participants supplied estimates that hovered around the 25% base rate, all ts < 1.2, all ps $> .12$, one-tailed, all η^2s $< .07$.

In sum, financially needy and non-needy students did not differ in their estimates of the likelihood of receiving a refund. Indeed, participants in the gain condition were relatively realistic in their estimates regardless of their level of financial need. Financially needy and non-needy students did differ, however, in their estimates of receiving a bill. Whereas non-needy students were realistic when facing a possible loss, needy students were pessimistic.

Experiment 2

Experiment 1 revealed that needy students were pessimistic in the face of a loss, whereas non-needy students were not. One purpose of Experiment 2 was to investigate whether needy students are pessimistic for all losses or discriminate between losses that are personally relevant and losses that are not. Prior research suggests that people generally are pessimistic for events that pose serious consequences, but not for events that have minor consequences (Taylor & Shepperd, 1998). But how general is this pessimism? Are people pessimistic only when predicting their own

outcomes, or are they equally pessimistic in predicting the outcomes of a friend? Because the outcomes of others are less personally relevant, we predict that people will be less pessimistic when predicting the outcomes of others than when predicting their own outcomes. To test this prediction, we had some participants estimate the likelihood that they would receive a bill and other participants estimate the likelihood that a friend would receive a bill.

A second purpose of Experiment 2 was to examine alternative explanations for the pessimism found in Experiment 1. Presumably financially needy students were pessimistic in their estimates because they were bracing for potentially bad news. According to the bracing hypothesis (Shepperd et al., 1996; Taylor & Shepperd, 1998), bad news is more aversive when unexpected and people thus predict the worst as feedback nears so they will not be unpleasantly surprised. It is possible, however, that participants were not bracing at all, but rather responding to a prime provided by the instructions (Bruner, 1957). According to the priming explanation, learning about the registrar's error prompted financially needy participants to recall past events where they experienced an unexpected financial loss. The availability of the memories of past financial loss led needy participants to estimate a loss as more likely. The prime led to pessimism among financially needy participants but not financially comfortable participants, either because needy participants had more experience with unexpected expenses or because instances of past unexpected financial expenses were more impactful and thus more memorable for needy participants.

Experiment 2 examined the extent to which the pessimism expressed by financially needy participants represents bracing for a negative event versus a response to memories primed by the description of the registrar's error. Some participants received a financial loss prime, whereas other participants received an irrelevant prime. The irrelevant prime was also negative to ensure that any differences were not attributable to differences in negative affect across conditions. If the pessimism in Experiment 1 is due to priming, then presumably needy and non-needy students will be equally pessimistic if first prompted to think about past financial losses. If, however, the pessimism is due to bracing, then needy participants will be pessimistic regardless of the prime and non-needy students will not be pessimistic regardless of the prime.

It is also possible that needy participants depend more on sources of money handled through the university to finance their education, sources such as loans, grants, scholarships, and work-study programs. With money coming from multiple sources, financially needy students may have inevitably experienced more billing errors in the past than non-needy students. As such, the greater pessimism of needy students may reflect their using prior experience to predict the future rather than an attempt to brace for disappointment. Presumably, the needy students would also reason that other students who are financing their education through multiple sources handled by the university (i.e., students on financial aid) would be just as likely to experience billing errors with the university. That is, needy students should reasonably generalize from their personal experience that the typical student receiving financial aid is also likely to have experienced billing problems with the university in the past and is equally likely to experience billing problems in the future. In short, if prior experience of billing problems with the university is responsible for the greater pessimism of needy students, then they should be just as pessimistic when rating the chance that other students who likely have had prior experiences of billing problems with the university will receive a bill. That is, pessimism of needy students should extend to other needy students (i.e., students receiving financial aid).

A final purpose of Experiment 2 was to examine the role that anxiety plays in personal predictions. As noted earlier, prior research reveals that pessimism is associated with greater anxiety. Although we did not directly manipulate anxiety in the present study, we assessed participants' anxiety just prior to their making their estimates, thereby permitting an examination of the relationship between anxiety and participants' estimates. We predicted that participants' personal predictions would correspond to their anxiety. Specifically, we predicted that needy participants should express greater anxiety than non-needy participants upon learning of the registrar's error, and that people who were most anxious would be most pessimistic in their predictions of receiving a bill.

Method

Participants. One hundred forty students (54 male, 86 female) participated voluntarily in a classroom setting and were randomly assigned to conditions. Participants received all information and instructions on a questionnaire distributed during class. Data from 11 participants (eight males, three females) were omitted, three because they failed to complete the packets and seven because they doubted the authenticity of the billing error.

Procedure. Experiment 2 used the same paradigm as Experiment 1 with several variations. First, all participants read that the registrar's error resulted in 25% of the student body being underbilled. Second, participants received one of two packets of instructions and questionnaires that were tailored to address specific hypotheses. One packet came in two forms and contained instructions and items designed to test the effect of personal relevance on participants' estimates. The second packet also came in two forms and contained instructions and items designed to test the effect of priming on participants' estimates. Participants received one packet or the other, but not both. We describe the two packets of questionnaires separately.

Personal relevance packet. Participants in the *friend condition* (n = 35) first received instructions to list a friend at the university with whom they did not live. Next, they read about the registrar's error and then received instructions in the packet to estimate the chances that their friend would receive a bill from the university. Participants in the *self condition* (n = 28) were not requested to list a friend and instead estimated the chances that they would receive a bill from the university. Similar to Experiment 1, participants supplied both likelihood (1 = *unlikely,* 11 = *likely*) and probability (0% to 100%) estimates.

Priming packet. The first page of the priming packet instructed participants to think about one of two negative events. In the *financial loss prime condition,* participants (n = 28) received instructions to remember an event where they experienced an unexpected financial loss. The instructions directed participants to recall, for example, an experience where they expected to pay a certain amount for something, then later found out that they were required to pay more. In the *irrelevant prime condition,* participants (n = 38) received instructions to recall a past situation where they experienced a great disappointment. The instructions directed participants to recall, for example, an experience where they believed they had done well on an exam only to find out later that they had done very poorly.

Participants in both priming conditions wrote a brief description of the event they recalled. Next, participants responded to three items (worried, anxious, concerned) measuring current mood using 9-point scales (1 = *strongly disagree,* 9 = *strongly agree*). The items were summed to form a single index of mood, range = 3 to 27, M = 11.82, SD = 7.03, Cronbach's

alpha = .84. On a separate page, participants next listed all thoughts they experienced while recalling and writing about their event. After the thought-listing task, participants read about the registrar's error, then estimated both the likelihood and probability that they would receive a bill. Finally, participants were asked to indicate, if they estimated a probability different than 25%, why they supplied a different probability. Of primary interest were the responses of participants who estimated a probability greater than 25%. These participants selected from the following explanations: (a) "I know pretty well what my tuition and fee charges should be and I had already suspected or detected the error"; (b) "I am bracing for the worst. Bad news feels worse when it is unexpected. I'm expecting a bill so I'll be ready for it"; (c) "I always seem to get hit by unexpected expenses or bills. I'm sure this is just another instance"; (d) "The university has made mistakes on my bills in the past and they have probably made a mistake in my case again"; and (e) "Other"; followed by space for participants to write their reason for supplying a higher estimate.

Items common to both packets. All participants responded to several items common to both questionnaires. First, all participants responded to the same five items used to assess financial need in Experiment 1, which were combined to form a single index of need, range = 5 to 54, M = 24.87, SD = 12.79, Cronbach's alpha = .92. Second, immediately after learning of the billing error but prior to estimating their chances of receiving a bill, participants responded to 10 adjectives assessing state anxiety (calm, tense, nervous, at ease, anxious, self-confident, jittery, relaxed, worried, joyful). Participants responded to each item with how they felt "right now, at this moment," using a four-step scale (1 = *not at all*, 4 = *very much so*). These items were summed (after reverse coding) to produce a measure of anxiety, range = 10 to 36, M = 21.02, SD = 6.73, Cronbach's alpha = .89. Third, all participants indicated the probability and the likelihood that the typical student receiving financial aid would receive a bill.

Fourth, participants responded to three items assessing the extent to which they were thinking about past financial losses while completing the billing questionnaire. Specifically, the items asked participants to indicate the extent to which (a) they were thinking about past situations in which they were suddenly faced with unexpected expenses or bills while supplying their estimates, (b) past examples of financial setbacks and unpleasant surprises were vivid in their mind, and (c) their responses were affected by memories of past experiences in which they were surprised by unexpected expenses. All responses were made on a scale ranging from 1 (*not at all*) to 9 (*a great deal*). Responses to the three items were summed to produce an index of priming, range = 3 to 33, M = 13.99, SD = 9.07, Cronbach's alpha = .93. Fifth, participants responded to three items assessing the extent to which they were thinking about future financial issues and concerns while completing the billing questionnaire. The items asked participants to indicate the extent to which (a) they were thinking ahead about difficulties the bill would present in the immediate future while supplying their estimates, (b) thoughts of future bills and expenses were vivid in their mind, and (c) their responses reflected an attempt to brace themselves for the possibility of a bill. All responses were made on a scale ranging from 1 (*not at all*) to 9 (*a great deal*). Responses to these items were summed to produce an index of bracing for future loss, range = 3 to 33, M = 16.32, SD = 8.50, Cronbach's alpha = .88.

Sixth, participants responded to three items assessing the extent to which they had prior experience with billing problems. The items asked participants to indicate the extent to which they (a) received a letter from the financial aid office indicating a problem in their fund disbursement, (b) had problems with finances because the financial aid office was slow or late in their fund disbursement, and (c) received a letter from the registrar's office indicating an error in their tuition and fees payment. All responses were made on a scale ranging from 1 (*not at all*) to 9 (*a great deal*). Responses to these items were summed to produce an index of prior experience, range = 3 to 33, M = 11.07, SD = 8.66, Cronbach's alpha = .85. When all participants had completed the questionnaire, they were thoroughly debriefed.

It is important to note that approximately 2 months prior to the present experiment the university made a real error in the disbursement of financial aid packages for the semester. The error involved several hundred students who received financial aid via direct deposit into their bank accounts. These students received as much as $300 more than they should have been allocated by the university. The university corrected the error in two to three weeks, but failed to notify students of the correction until after the funds were reclaimed. The error received considerable attention in the school's popular daily newspaper, and stories circulated of students who spent the extra money and faced financial problems when the university reclaimed the overpayment. Because the error occurred in the disbursement of financial aid packages, only students receiving some form of aid through the university (loans, scholarships or grants) were affected. As will become apparent, this highly publicized error likely affected participants' estimates in Experiment 2.

Results and Discussion

As noted earlier, participants completed one of two forms of the questionnaires. While the two forms had many items in common, there were some items unique to each form. For ease of presentation, we organize our presentation of the results around key hypotheses. Small variations in the degrees of freedom resulted from some participants omitting responses to some items.

Pessimism and personal relevance. Were needy participants pessimistic regardless of the target, or were they pessimistic only when rating their own chances of receiving a bill? That is, did the news of a possible bill elicit general pessimism about financial outcomes, or was the pessimism limited to judgments specifically relevant to oneself? Figure 2 presents probability estimates of financially needy and non-needy participants who rated a friend vs. themselves. Scores are plotted for points one standard deviation above and below the mean financial need score using procedures recommended by Aiken and West (1991). As with Experiment 1, the pattern of data for the likelihood and probability estimates was virtually identical. Consistent with predictions, participants were most pessimistic when they were high in financial need and rating the likelihood that they personally would receive a bill. Of note, participants appeared pessimistic (rating the probability as higher than 25%) in several conditions. As noted earlier, we suspect that the general pessimism resulted from a highly publicized reimbursement error by the university that occurred earlier in the term.

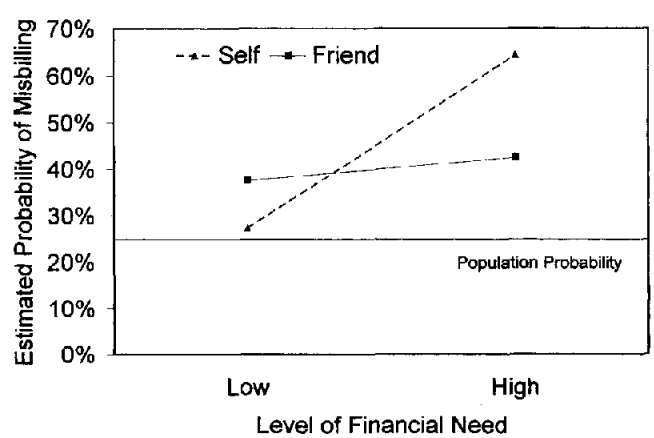

Figure 2. Probability estimates in Experiment 2.

We examined the likelihood and probability estimates statistically using simultaneous multiple regression procedures in which Need (after centering), Target of Rating, and the Need by Target Interaction were entered as predictors of the responses of the subset of participants who received the Personal Relevance Packet (n = 63). Analysis of the likelihood estimates revealed a significant main effect of Need, $F(1, 59) = 8.76$, $p < .01$, $\eta^2 = .13$, qualified by a marginally significant interaction of Need and Target, $F(1, 59) = 3.34$, $p = .08$, $\eta^2 = .05$. Analysis of the probability estimates revealed a significant main effect of Need, $F(1, 59) = 10.36$, $p < .01$, $\eta^2 = .15$, qualified by an interaction of Need and Target, $F(1, 59) = 7.33$, $p < .01$, $\eta^2 = .11$. For the likelihood estimates, examination of the regression coefficients separately for the self and friend condition revealed that participants who rated a friend provided similar estimates regardless of financial need, $b = .03$, $t(33) = 1.01$, $p > .31$, $\eta^2 = .04$. By contrast, participants who rated themselves were more pessimistic if they were financially needy than if they were non-needy, $b = .11$, $t(26) = 3.25$, $p < .01$, $\eta^2 = .29$. For the probability estimates, examination of the regression coefficients separately for the self and friend condition revealed that participants who rated a friend provided similar estimates regardless of financial need, $b = .19$, $t(33) = .54$, $p > .59$, $\eta^2 = .01$. By contrast, participants who rated themselves were more pessimistic if they were financially needy than if they were non-needy, $b = 1.51$, $t(26) = 4.73$, $p < .001$, $\eta^2 = .46$.

For illustration purposes, we separated needy and non-needy participants using a median split and compared their probability estimates to the 25% base rate. The results of several dependent t tests were consistent with what is visually apparent in Figure 2. Specifically, needy students rating their own chances of receiving a bill differed from the 25% base rate in their probability judgments, $t(15) = 4.82$, $p < .001$, $\eta^2 = .61$. So also did needy students, $t(15) = 2.14$, $p < .05$, $\eta^2 = .05$, and non-needy students, $t(18) = 2.74$, $p < .05$, $\eta^2 = .29$, rating a friend. These latter two effects, however, were notably weaker. Finally, non-needy students rating their own risk did not differ from the 25% base rate in their probability judgments, $t(11) = 1.74$, $p > .10$, $\eta^2 = .22$. Once again, the general pessimism likely stems from the highly publicized error in disbursement of funds that occurred earlier in the semester.

We also separated participants according to their probability estimates. Table 1 presents the frequency of participants who were optimistic, pessimistic, and realistic relative to the 25% base rate. The data show that participants appeared pessimistic most often if they were financially needy and rated their personal chances of being billed.

In sum, needy students were more pessimistic in their personal risk judgments than in their risk judgments for a friend. This finding suggests that the pessimism of needy students does not reflect a generalized pessimism regarding financial outcomes; rather it reflects pessimism regarding outcomes that are specific to the self. Viewed another way, the findings suggest that, consistent with earlier findings on event seriousness, needy students were more pessimistic when making predictions about an event that was highly self-relevant (their personal likelihood of receiving a bill) than an event that was less self-relevant (a friend's likelihood of receiving a bill).

Table 1
Experiment 2: Frequency and Number of Pessimists, Realists, and Optimists as a Function of Financial Need and Target (Self vs. Friend) of the Rating

	Pessimists		Realists		Optimists	
Rating	Frequency (%)	n	Frequency (%)	n	Frequency (%)	n
Rating oneself						
Non-needy	58	7	25	3	17	2
Needy	81	13	6	1	13	2
Rating a friend						
Non-needy	37	7	47	9	16	3
Needy	50	8	31	5	19	3

Note. Participants were labeled optimistic if their probability estimate was below the 25% base rate, pessimistic if their estimate exceeded the 25% base rate, and realistic if their estimated equaled the 25% base rate.

Does the pessimism stem from priming? As noted earlier, in judging their chances of receiving a bill, students may merely have searched their past for instances in which they had suffered an unexpected loss, and past instances may have been more frequent or more readily available for needy students than non-needy students. As such, needy participants may not have been bracing, but rather responding to memories of past unexpected losses. The data just presented for friend vs. self-ratings would seem to argue against this interpretation. Specifically, if the news of a billing error merely evoked or primed thoughts about past unexpected losses, then presumably these primed thoughts would color self and friend estimates alike. However, we found greater pessimism among high-need participants rating their own chances than among participants rating a friend.

Nevertheless, to test this explanation more directly, a subset of participants (n = 66) received the prime manipulation. Preliminary analyses revealed that the priming manipulation was quite successful. Specifically, two judges read the thoughts listed by participants during the thought-listing task and indicated high agreement both in the total number of thoughts listed, $r(66) = .95$ and the number of financially related thoughts listed, $r(66) = .76$. Statistical analyses further revealed that participants in the financial prime condition listed more financially related thoughts ($M = .52$, $SD = .60$) than did participants in the irrelevant prime condition ($M = .01$, $SD = .08$), $F(1, 62) = 25.87$, $p < .0001$, $\eta^2 = .30$. Finally, we found no differences across conditions in mood following the priming task, all $Fs(1, 62) < 1.44$, $p > .23$, $\eta^2 = .02$. Nor did we find any main effects or interactions involving need for the number of financial related thoughts listed in response to the priming index, all $Fs(1, 62) < .31$, $p > .58$, $\eta^2 = .00$. Thus, needy students were no more sensitive than non-needy students to the prime manipulation.

The prime manipulation made needy and non-needy students equally cognizant of past unexpected financial losses. If the greater pessimism found in Experiment 1 stemmed from thoughts of past financial losses, then needy and non-needy students in the financial prime condition should be equally pessimistic, and both should display more pessimism than low-needy participants in the no prime condition. We tested the effect of the priming in three ways and all three revealed that priming did not affect participants'

estimates. First, we conducted a regression analysis on participants' estimates in which we entered Need, the Prime Manipulation, and the Need by Prime Interaction as predictors of the responses of the subset of participants who received the Priming Packet ($n = 66$). Analysis of the likelihood and probability estimates revealed no main effects or interactions involving the prime manipulation, all $Fs < 1$. The only effect to emerge was a significant effect of Need both for participants' ratings of the likelihood that they would receive a bill, $F(1, 62) = 4.94, p < .05, \eta^2 = .07$, and for their probability estimates, $F(1, 62) = 7.41, p < .05, \eta^2 = .11$. We separated participants into high- and low-need groups via a median split to compare their estimates to the 25% base rate using dependent t tests. The analyses revealed that needy students were pessimistic and non-needy students were realistic regardless of the prime. Specifically, financially needy students were pessimistic in both the financial prime condition ($M = 41.6$, $SD = 26.5$), $t(13) = 2.35, p = .05, \eta^2 = .30$, and the irrelevant prime conditions ($M = 54.1$, $SD = 30.7$), $t(18) = 4.12, p < .01, \eta^2 = .49$. Non-needy students were realistic in both the financial prime condition ($M = 36.3$, $SD = 31.0$), $t(13) = 1.36, p > .18, \eta^2 = .09$, and the irrelevant prime condition, ($M = 33.7$, $SD = 26.2$), $t(18) = 1.46, p > .16, \eta^2 = .11$.

Importantly, we conducted a second set of analyses in which we included participants who received the Personal Relevance Packet and rated their own chances (as opposed to a friend's chances) of receiving a bill. This permitted examination of whether merely being primed affected estimates. Analyses revealed an effect of need for both likelihood, $F(1, 88) = 11.88, p < .001, \eta^2 = .12$, and probability estimates, $F(1, 88) = 19.24, p < .001, \eta^2 = .18$, but no main effects or interactions involving the prime, all $Fs(1, 88) < 1.71, p > .18, \eta^2 < .02$. Thus, the prime manipulation clearly had no effect on participants' judgments of their chances of receiving a bill.

Second, we separated participants according to their probability estimates. Table 2 presents the frequency of participants who were optimistic, pessimistic, and realistic in their estimates relative to the 25% base rate. The data reveal no evidence of greater pessimism in the financial prime condition than in the irrelevant prime condition. If anything, participants appear more pessimistic in the irrelevant prime condition. Thus, being primed to think about past unexpected financial losses had no effect on participants' judgments.

Third, we used the three-item Priming Index (after centering) to examine whether thoughts about past financial losses were driving the greater pessimism of high-need participants. A sketch of the model we tested is presented in Figure 3, Panel A. Analyses revealed that (a) financially needy students believe that they were more likely than non-needy students to receive a bill (*path x*); (b) needy students reported thinking more about past financial losses (as measured by our Priming Index) when responding to the questionnaire than did non-needy students (*path y*); and (c) thoughts of past financial losses were associated with pessimism (*path z*). Importantly, however, need remained a significant predictor of participants' estimates even after controlling for thoughts of past losses by entering the Priming Index simultaneously as a predictor. Thus, while the news of the billing error prompted greater thinking of past financial losses, these thoughts were not responsible for the greater pessimism of needy students.

We tested the model statistically in a series of regression analyses (see Baron & Kenny, 1986). Because participants receiving the Personal Relevance Packet also responded to the items comprising the Priming Index, we included the 28 participants who rated their own risk (as opposed to a friend's risk) in the analyses of responses to the Priming Index, resulting in 94 participants in the analysis. First, analyses of the likelihood and probability estimates revealed that high-need participants reported a greater likelihood, $F(1, 91) = 12.10, p < .001, \eta^2 = .12$, and probability, $F(1, 91) = 18.37, p < .001, \eta^2 = .17$, than low-need participants of receiving a bill (*path x*). Second, need was associated with memories of past financial losses (*path y*), $F(1, 91) = 24.31, p < .0001, \eta^2 = .21$. Third, memories of past financial losses were associated with greater likelihood estimates, $F(1, 92) = 9.90, p < .01, \eta^2 = .10$, and probability estimates, $F(1, 92) = 11.65, p < .001, \eta^2 = .11$ (*path z*). Finally, we entered the Priming Index and Need simultaneously into the regression model to control statistically for differences between needy and non-needy participants in memories of past financial losses. Although reduced somewhat in predictive power, need nevertheless remained a significant predictor of participants' likelihood estimates, $F(1, 90) = 5.37, p < .05, \eta^2 = .06$, and their probability estimates, $F(1, 90) = 8.95, p < .01, \eta^2 = .09$.

In sum, when viewed as a whole, the results from three approaches to analyzing the data revealed that thoughts of past unexpected bills were not driving the greater pessimism of high-

Table 2
Experiment 2: Frequency and Number of Pessimists, Realists, and Optimists as a Function of Financial Need and the Prime

	Pessimists		Realists		Optimists	
Condition	Frequency (%)	Number	Frequency (%)	Number	Frequency (%)	Number
Financial prime						
Non-needy	47	7	20	3	33	5
Needy	57	8	29	4	14	2
Irrelevant prime						
Non-needy	53	10	21	4	26	5
Needy	79	15	0	0	21	4

Note. Participants were labeled optimistic if their probability estimate was below the 25% base rate, pessimistic if their estimate exceeded the 25% base rate, and realistic if their estimated equaled the 25% base rate.

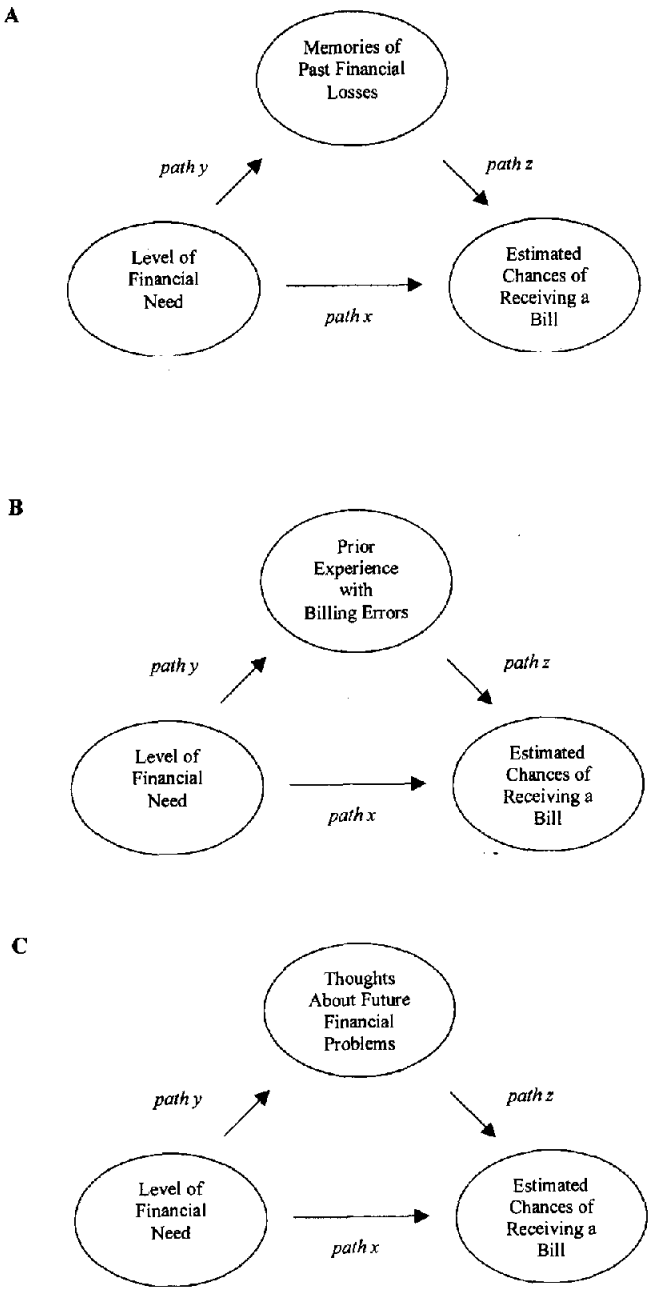

Figure 3. Model of how need affects estimates.

need participants. Although analyses involving the Priming Index revealed that Priming absorbed some of the variance in participants' estimates, Need remained a significant predictor.

Does the pessimism stem from experiences of prior billing problems? As noted earlier, the reliance of needy students on multiple sources of funding handled by the university may have resulted in needy students having experienced more billing errors in the past. Did prior experience account for the greater pessimism of needy students? Some preliminary data suggest the answer is yes. Specifically, we had participants rate the chances that the typical financial aid student would receive a bill. If prior experience accounts for the pessimism of needy students, then needy students should be equally pessimistic for other students who were likely to have experienced billing errors in the past (i.e., students receiving financial aid). Analyses of participants' ratings of the chances that the typical financial aid student would receive a bill revealed a significant effect of Need for both likelihood estimates, $F(1, 92) = 14.64, p < .001, \eta^2 = .14$, and probability estimates, $F(1, 92) = 14.15, p < .001, \eta^2 = .13$. Financially needy students were more inclined than non-needy students to believe that the typical financial aid student would receive a bill.

To address more directly whether prior experience with billing errors accounts for the difference between needy and non-needy students in their estimates, we conducted a series of regression analyses using our Index of Prior Experience. These analyses were similar to those conducted for the Priming Index. A sketch of the model we tested is presented in Figure 3, Panel B. Analyses revealed that (a) financially needy students believe that they were more likely than non-needy students to receive a bill (*path x*); (b) needy students reported having more experience with billing problems than did non-needy students (*path y*); and (c) prior experience with billing problems was associated with pessimism (*path z*). Importantly, however, Need remained a significant predictor of participants' estimates, even after controlling for prior experience with billing problems. Thus, while needy students report more prior experience with billing problems, the greater prior experience was not responsible for the greater pessimism of needy students.

As with the analysis of the Priming Index, we excluded those participants receiving the Personal Relevance Packet who rated a friend's chances of receiving a bill rather than their own chances, leaving 94 participants in the analysis. Once again, Need was associated with participants' estimates, with needy students reporting a greater likelihood, $F(1, 91) = 12.10, p < .001, \eta^2 = .12$, and probability, $F(1, 91) = 18.37, p < .001, \eta^2 = .17$, of receiving a bill (*path x*). Analyses also revealed that Need was associated with the Index of Prior Experience, $F(1, 91) = 22.76, p < .0001, \eta^2 = .20$, such that needy students had more prior experience with billing errors than did non-needy students (*path y*). Third we used the Index of Prior Experience to predict likelihood and probability estimates (*path z*). Analyses revealed that prior experience was associated with higher likelihood, $F(1, 93) = 7.27, p < .01, \eta^2 = .07$, and probability estimates, $F(1, 93) = 9.81, p < .01, \eta^2 = .10$. Finally, we entered the Index of Prior Experience and Need simultaneously into the regression model to control statistically for differences between needy and non-needy participants in prior experiences. Need, while reduced somewhat in predictive power, remained a significant predictor of participants' likelihood estimates, $F(1, 91) = 6.54, p < .05, \eta^2 = .07$, and probability estimates, $F(1, 91) = 11.46, p < .01, \eta^2 = .11$.

In sum, needy students were more likely than non-needy students to report that the typical financial aid student would receive a bill. They were also more likely to report experiencing billing errors with the university in the past. Finally, prior experience with billing errors was significantly associated with estimates of the chances of receiving a bill. These findings notwithstanding, needy students were significantly more pessimistic than non-needy students even after statistically controlling for prior experience with billing problems. Thus, prior experience, while accounting for some of the variance in estimates, does not explain why needy students were more pessimistic than non-needy students.

The difference between the predictions participants provided for a friend vs. the predictions they provided for the average student merits discussion. Whereas needy and non-needy students did not differ in their predictions regarding the chances that a friend would receive a bill, needy students were more likely than non-needy students to predict that the typical student on financial aid would receive a bill. The former finding suggests that participants were not indiscriminant in their pessimism. The latter finding suggests that needy students nevertheless uniquely viewed some people (students on financial aid) at greater risk for receiving a bill. The unique perception of financially needy students (one not shared by non-needy students) may stem from a greater sensitivity to the financial problems that students on financial aid face. It is also possible that needy students were aware that the highly publicized disbursement error occurred only for students receiving financial aid, whereas non-needy students were not.

Does the pessimism reflect bracing? Participants receiving the priming packet also received a final item asking them, if they estimated a probability of receiving a bill different from 25%, to indicate why they estimated a different probability. Table 3 presents the responses of the 41 participants (61% of all participants) who provided reasons for estimating a probability greater than 25%. The most common response was that they were bracing for bad news. Of note, a large number of students (34%) reported that they were pessimistic because they had experienced billing errors with the university in the past. This finding suggests that prior experience with billing problems with the university may in fact have played a role in participants' pessimism. Of course, as others have noted (Nisbett & Wilson, 1977), people are often unaware of what factors influence their behavior, suggesting that these reports should be viewed cautiously.

We used the three-item Bracing Index (after centering) to examine whether the greater pessimism of high-need participants reflects an attempt to brace for possible future loss. The model we tested appears in Figure 3, Panel C. Based on analyses presented earlier, we knew that financially needy students believed that they were more likely than non-needy students to receive a bill (*path x*). Additional analyses revealed that needy students reported thinking more than non-needy students about problems the bill would present in the future (*path y*), and that the Bracing Index was associated with pessimism (*path z*). Importantly, when we simultaneously entered Need and our Bracing Index as predictors of students' estimates to control statistically for differences in responses to our Bracing Index, Need no longer significantly predicted participants' likelihood and probability estimates. This finding provides initial evidence that the greater pessimism of needy students may be driven by an attempt to brace for the possibility of a bill.

We tested the model statistically in a series of regression analyses. Again, we excluded from analyses those participants (n = 35) who rated a friend's chances of receiving a bill rather than their own chances, leaving 95 participants in the analysis. As noted earlier, *path x* was significant for both the likelihood, $F(1, 91) = 12.10$, $p < .001$, $\eta^2 = .12$, and probability, $F(1, 91) = 18.37$, $p < .001$, $\eta^2 = .17$, of receiving a bill. Additional analyses revealed that Need was associated with responses to our Bracing Index (*path y*), $F(1, 91) = 101.03$, $p < .0001$, $\eta^2 = .53$. Analyses also revealed that our Bracing Index was associated with greater likelihood estimates, $F(1, 93) = 24.64$, $p < .0001$, $\eta^2 = .21$, and probability estimates, $F(1, 93) = 25.78$, $p < .0001$, $\eta^2 = .22$ (*path z*). Finally, when our Bracing Index and Need were entered simultaneously into the regression model to control statistically for differences in Bracing, Need no longer predicted participants' likelihood estimates, $F(1, 91) = .03$, $p > .85$, $\eta^2 = .00$, or their probability estimates, $F(1, 91) = 1.33$, $p > .25$, $\eta^2 = .01$, whereas the Bracing Index continued to predict both likelihood estimates, $F(1, 91) = 10.35$, $p < .01$, $\eta^2 = .10$, and probability estimates, $F(1, 91) = 7.67$, $p < .01$, $\eta^2 = .08$.

In sum, the results suggest that the pessimism of needy students reflects an attempt to brace for loss. The most common response participants gave for being pessimistic in their estimates was that they were preparing for the worst. Moreover, needy students reported thinking more than non-needy students about the prospect of disappointment should they receive a bill, and these thoughts were significantly related to participants' estimates of their chances of receiving a bill. Finally, the differences in estimates between needy and non-needy students disappeared when we statistically controlled for thoughts about the future.

Comparing the bracing, priming, and prior experience explanations. Our indices of Bracing, Priming, and Prior Experience were each associated with greater pessimism. In addition, although Need no longer predicted differences in estimates when the Bracing Index was included as a predictor, other analyses revealed that both the Priming Index and the Prior Experience Index absorbed some of the variance common to Need and the two estimates. Finally, the indices were highly correlated. The Bracing Index correlated strongly with the Priming Index, $r(94) = .64$, and the Prior Experience Index, $r(95) = .42$, and the Priming Index cor-

Table 3
Experiment 2: Responses of Pessimistic Participants for Why They Estimated a Probability of Receiving a Bill as Greater Than the 25% Base Rate

n	Percentage	Response
0	0	I know pretty well what my tuition and fee charges should be and I had already suspected or detected the error.
17	41	I am bracing for the worst. Bad news feels worse when it is unexpected. I'm expecting a bill so I'll be ready for it.
4	10	I always seem to get hit by unexpected expenses or bills. I'm sure this is just another instance.
14	34	The university has made mistakes on my bills in the past and they have probably made a mistake in my case again.
6	15	Other (e.g., dumb luck; chance; I'm not sure).

related with the Prior Experience Index, $r(94) = .54$. The high correlations raise the possibility that it is not thoughts about disappointment per se that lead to pessimism, but rather cognitions about financial problems. If such is the case, then our Bracing Index predicts participants' estimates only insofar as it measures cognitions about financial problems. According to this logic, the Priming Index and Prior Experience Index could serve as reasonable proxies for the Bracing Index, and if all three were entered simultaneously into a regression analysis, none would uniquely predict participants' estimates.

To examine this possibility, we entered the three indices simultaneously into a regression model predicting participants' estimates of the likelihood and probability of receiving a bill. The analyses revealed that only the Bracing Index uniquely predicted participants' estimates of their chances of getting a bill. Specifically, the Bracing Index predicted participants' likelihood estimates, $F(1, 90) = 12.06$, $p < .0001$, $\eta^2 = .12$, whereas the Priming Index and the Prior Experience Index did not, both $Fs(1, 90) < .80$, both $ps > .37$, both $\eta^2 < .01$. Similarly, the Bracing Index predicted participants' probability estimates, $F(1, 90) = 10.72$, $p < .01$, $\eta^2 = .11$, whereas the Priming Index, $F(1, 90) = .00$, $p > .98$, $\eta^2 = .00$, and the Prior Experience Index, $F(1, 90) = 1.74$, $p > .19$, $\eta^2 = .02$, did not.

In sum, our three indices are not interchangeable and are not measuring some common construct such as cognitions about financial problems. Only the Bracing Index uniquely predicted participants' estimates of receiving a bill. The effect of the Priming and Prior Experience Indices were entirely attributable to their correlation with the Bracing Index.

Anxiety, cognitions, and pessimism. We proposed that the effect of financial need on participants' estimates would correspond to their level of anxiety. Our rationale was the prospect of a bill would elicit thoughts about future financial problems, the thoughts would elicit anxiety, and the anxiety would prompt participants to become pessimistic in an attempt to brace for possible bad news. It is possible, however, that the relationship of anxiety and thoughts is reversed. Specifically, the prospect of a bill may create anxiety, which in turn prompts thoughts about future financial problems. The thoughts then lead participants to become pessimistic. Both approaches assume that anxiety plays a role in predictions. The former, however, assumes that anxiety is most closely linked to predictions, whereas the latter assumes that cognitions are most closely linked to predictions.

We conducted a series of regression analyses to examine whether anxiety or cognitions are more closely linked to predictions. Preliminary analyses revealed that Anxiety correlated with participants' likelihood estimates, $r(95) = .26$, $p = .05$, and probability estimates, $r(95) = .33$, $p = .01$, indicating that anxious students were more pessimistic. In addition, Need correlated significantly with Anxiety, $r(94) = .57$, $p < .0001$, indicating that the greater the students' financial need, the more anxious they were after hearing about the registrar's error. Finally, Anxiety correlated with the Bracing Index, $r(94) = .54$, $p < .0001$, indicating that greater Anxiety was associated with more thoughts about future hardships an unexpected bill would create.

Importantly, when we examined Need and Anxiety simultaneously as predictors of participants' estimates, Need continued to predict participants' likelihood estimates, $F(1, 91) = 6.13$, $p < .05$, $\eta^2 = .06$, and probability estimates, $F(1, 91) = 8.62$, $p < .01$, $\eta^2 = .09$. However, the effect of Need on participants' estimates was notably lower when Anxiety was included as a predictor than when Anxiety was not included as a predictor (for likelihood estimates, $\eta^2 = .06$ vs. $\eta^2 = .12$; for probability estimates, $\eta^2 = .09$ vs. $\eta^2 = .17$). Finally, we conducted an analysis in which we simultaneously entered the Bracing Index and Anxiety as predictors of participants' estimates. Analyses revealed that anxiety no longer predicted either likelihood estimates, $t(92) = 0.09$, $p > .92$, $\eta^2 = .00$, or probability estimates, $t(92) = 0.98$, $p > .33$, $\eta^2 = .01$, whereas the Bracing Index continued to predict both, both $ts(92) > 3.74$, $p < .001$, $\eta^2 = .13$.

Thus, it appears that participants' thoughts about future financial problems were more closely linked to their predictions than was anxiety, suggesting that the thoughts about potential bad news are more central to people's predictions than is anxiety. Indeed, anxiety may lead to pessimism only insofar as it prompts cognitions about the meaning or consequences of bad news.

Summary

The results of Experiment 2 bring us considerably closer to understanding why people high in financial need are pessimistic about the prospect of receiving a bill and the generality of the pessimism. Regarding why needy participants are pessimistic, the results suggest that the greater pessimism does not stem from news of the registrar's error priming thoughts of past financial problems or differences between high- and low-need participants in their prior experience with billing problems with the university. Instead, the results suggest that the pessimism of needy participants reflects an attempt to brace for loss. Specifically, when differences in bracing were statistically controlled, neither Need nor Priming nor Prior Experience predicted participants' estimates. In addition, consistent with prior research (Shepperd et al., 1996; Taylor & Shepperd, 1998), pessimistic predictions were associated with anxiety. However, anxiety did not account entirely for the differences between needy and non-needy students in their predictions. Moreover, thoughts about the problems that would arise from an unexpected bill were more closely linked to predictions than was anxiety. Finally, regarding the generality of the pessimism, needy participants were pessimistic only when making estimates about their own chances of receiving a bill and not in their estimates for a friend, suggesting that needy participants are not indiscriminant in their pessimism.

Experiment 3

The primary purpose of Experiment 3 was to rule out one final alternative explanation for why needy students were more pessimistic than non-needy students about their prospects of receiving a bill. It is possible that the financially needy students differed from non-needy students in ways other than their financial status, and that their pessimism in response to the registrar's error represents a dispositional pattern of judgments about future outcomes. For example, past research has shown that people suffering from mild depression or dysphoria are less optimistically biased in their risk estimates than people who are not depressed (Alloy & Ahrens, 1987; Pietromonaco & Markus, 1985; Pyszczynski, Holt, & Greenberg, 1987). Perhaps the financial needy students in the present experiments were mildly depressed or dysphoric or dif-

fered from non-needy participants on some other trait or characteristic that led them to respond pessimistically. In short, the greater pessimism found among financially needy students might represent a dispositional tendency to be less optimistically biased. To examine this possibility, we had participants estimate the likelihood that they and the average student would experience a variety of future events typically associated with the optimistic bias. If the predictions of financially needy students represent a dispositional tendency toward greater pessimism, then needy students should display greater pessimism than non-needy students for a variety of events. However, if the predictions of financially needy students represent a unique response to financial threat, then needy students should not differ from non-needy students in their predictions for nonfinancial events.

A second purpose of Experiment 3 was to examine again the role anxiety plays in people's predictions. Although Experiment 2 found that high anxiety was associated with greater pessimism, the results revealed only weak evidence that the effects of need on participants' estimates are explained by differences in anxiety. The weakness of the anxiety-pessimism relationship in Experiment 2 led us to reexamine the relationship in Experiment 3.

Method

Participants. Thirty-five students (12 males, 23 females) from an undergraduate psychology class participated without compensation.

Procedure. The procedures and items were identical to the bill condition in Experiment 1 with the following exceptions. First, after learning about the registrar's error and the possibility that they might receive a bill, participants responded to the same 10-item state anxiety inventory used in Experiment 2 (range = 10 to 32, $M = 21.1$, $SD = 6.44$, Cronbach's $\alpha = .89$). Participants then estimated the likelihood that they would receive a bill. Second, participants completed an additional questionnaire in which they reported their own risk and the average student's risk (their same sex and age) of experiencing 12 negative events anchored by 1 = *not at all likely* and 7 = *extremely likely*. The events were typical of those used in prior research of relative risk estimates (Perloff & Fetzer, 1986). The events were cancer, heart attack, hypertension, drinking problem, STD (such as gonorrhea, chlamydia, syphilis, etc.), HIV/AIDS, injury in a car accident, nervous breakdown, mugging, divorce, unplanned pregnancy, and suicide. We created a measure of personal risk by summing participants' personal risk estimates for the 12 events (range = 1.08 to 4.83, $M = 2.78$, $SD = 0.77$, Cronbach's $\alpha = .72$). We also created a measure of relative risk by first subtracting participants' own risk estimate from the risk estimate they supplied for the average student to create a difference score for each event, then taking the average of the sum of these 12 difference scores (range = 0.33 to 3.75, $M = 1.7$, $SD = 0.86$, Cronbach's $\alpha = .75$).

Results and Discussion

Likelihood and probability estimates. Regarding the likelihood estimates, preliminary analysis revealed that need was uncorrelated with participant's judgments of the likelihood that they would receive a bill, $r(35) = .22$, $p = .21$. Although perhaps due to the small sample size, this finding was surprising given that the two prior experiments each showed that high financial need was associated with greater likelihood estimates of receiving a bill. Because the correlation was not significant, we do not discuss the likelihood estimates further.

Regarding the probability estimates, preliminary analyses revealed that Need correlated with participants' probability estimates, $r(35) = .40$, $p = .02$. The greater the students' financial need, the more anxious they were after learning about the registrar's error and the less optimistic they were in their probability estimates.

For illustration purposes, we separated financially needy and non-needy students using a median split and then compared their probability estimates to the 25% base rate. Financially needy students were pessimistic in their estimates ($M = 39.00$, $SD = 5.96$), whereas non-needy students were more realistic ($M = 20.29$, $SD = 8.60$). Specifically, dependent t tests revealed that financially needy students differed from the 25% base rate in their estimates, $t(16) = 4.23$, $p < .001$, $\eta^2 = .53$, whereas non-needy students did not, $t(16) = 0.69$, $p > .49$, $\eta^2 = .03$. The differences between needy and non-needy students is further illustrated in the frequency with which they were optimistic, realistic, and pessimistic in their probability estimates. As evident in Table 4, needy students were overwhelmingly pessimistic, whereas non-needy students were more evenly dispersed in their estimates.

Predictions for nonfinancial outcomes. Were financially needy students pessimistic for all outcomes or just outcomes relevant to financial loss? To examine this question, we correlated scores on the index of financial need with the index of personal risk estimates and with the index of relative risk estimates. Need correlated with neither the index of personal risk estimates, $r(35) = .23$, $p > .18$, nor the index of relative risk, $r(35) = .06$, $p > .70$. Thus, the greater pessimism among financially needy participants was not due to financially needy participants being more pessimistic in general. Indeed, dependent t tests revealed that both needy ($M = 1.8$, $SD = 0.97$) and non-needy ($M = 1.6$, $SD = 0.74$) students were highly optimistic in their relative risk estimates for the 12 events, reporting that they were less likely than

Table 4
Experiment 3: Frequency and Number of Pessimists, Realists, and Optimists as a Function of Financial Need

	Pessimists		Realists		Optimists	
Financial need	Frequency (%)	Number	Frequency (%)	Number	Frequency (%)	Number
Non-needy	35	6	30	5	35	6
Needy	78	14	6	1	16	3

Note. Participants were labeled optimistic if their probability estimate was below the 25% base rate, pessimistic if their estimate exceeded the 25% base rate, and realistic if their estimated equaled the 25% base rate.

the average student to experience the events, both $ts(17) > 7.59$, both $ps < .0001$, both $\eta^2 > .77$.

Anxiety. As in Experiment 2, we proposed that the effect of financial need on participants' estimates would correspond to their level of anxiety. Analyses revealed that anxiety correlated with participants' probability estimates, $r(35) = .40, p = .02$, indicating that anxious students were less optimistic. In addition, Need correlated significantly with anxiety, $r(35) = .52, p < .002$, indicating that the greater the students' financial need, the more anxious they were after hearing about the registrar's error. More important, however, were the results of analysis examining whether the effect of Financial Need on participants' estimates was attributable to differences in anxiety. The analysis revealed that Financial Need, when entered by itself, predicted participants' probability estimates, $F(1, 32) = 6.09, p > .02, \eta^2 = .16$. However, when Anxiety was added to the model simultaneous with Need, Need no longer predicted participants' probability estimates, $F(1, 31) = 2.01, p > .16, \eta^2 = .01$. Thus, anxiety accounted for the differences in predictions of needy and non-needy students.

In sum, we once again found that financially needy students were more pessimistic than non-needy student about a possible loss. In addition, we found that the pessimism of needy students was limited to their estimates of the probability that they would receive a bill and did not generalize to other events. Thus, the pessimism we found among financially needy participants does not represent a dispositional tendency to be pessimistic, but rather a response to a specific situational cue. Finally, unlike Experiment 2, which found that Need continued to predict variability in predictions even after individual differences in anxiety were removed, Experiment 3 found that the greater pessimism of financially needy participants was accounted for by differences in anxiety.

General Discussion

Some people facing the possibility of bad news are pessimistic, expecting the worst, whereas other people are more realistic. We proposed that personal predictions in anticipation of possible bad news vary according to the severity of the consequences of the news, and that the severity depends on personal needs, priorities, and desires. We examined this hypothesis in a specific context by threatening people who varied in financial need with the possibility of an unexpected bill. The results from three experiments revealed that, when faced with a possible unexpected bill, people who are financially needy are pessimistic. People who are financially comfortable, by contrast, are more realistic.

The three experiments also reveal several additional findings that move us considerably beyond prior research examining the relationship between event seriousness or importance and estimates. First, consistent with prior research on loss aversion (Kahneman & Tversky, 1984), the greater pessimism among financially needy participants occurred for potential losses but not potential gains. Specifically both financially needy and non-needy students were realistic when estimating their chances of receiving a gain in the form of a reimbursement check. Second, needy students were not indiscriminant in the predictions about receiving a bill. Whereas needy students were pessimistic in their own chances of receiving a bill, they were not pessimistic about a friend's chances of receiving a bill. In addition, the pessimism of needy students was limited to their predictions about getting a bill and did not generalize to other events. That is, they were just as optimistic as non-needy students in their estimates of experiencing a non-financial related events (e.g., a heart attack, divorce, unplanned pregnancy). Thus, the greater pessimism of needy students seems to be context specific and not a general tendency to be pessimistic.

Third, the greater pessimism of financially needy students was not attributable to the news of the billing error priming greater memories of past unexpected financial losses or to greater prior experience among needy students with billing problems with the university. Specifically, priming participants to think about past financial losses had no effect on the predictions of needy and non-needy students. Moreover, need continued to predict differences in participants' estimates even after controlling statistically for differences in thoughts about past losses and prior experiences with billing problems with the university. Fourth, the results suggest that the pessimism of needy participants reflects an attempt to brace for loss. Specifically, when differences in bracing were statistically controlled, neither Need nor Priming nor Prior Experience predicted participants' estimates.

Finally, consistent with prior research, we found that the effect of need on participants' estimates is associated with differences in anxiety. Specifically, in both Experiments 2 and 3 needy participants were more anxious than were non-needy participants, and anxiety correlated with pessimism. However, the effect of need on predictions was attributable to differences in anxiety in Experiment 3 but not in Experiment 2. That is, in Experiment 2, need continued to predict differences in predictions even after statistically controlling for differences in anxiety. Moreover, in Experiment 2, the effects of anxiety on predictions were absorbed entirely by people's thoughts about the hardships an unexpected bill would create. The implication is that people's pessimistic predictions in anticipation of possible bad news may arise more directly from cognitions rather than their anxiety over the prospect of an unexpected surprise. Clearly, the role that thoughts vs. anxiety plays in people's predictions in anticipation of possible bad news merits further investigation.

Bracing and Optimism

Financially needy participants were consistently pessimistic in their estimates of receiving a bill, whereas non-needy participants were consistently realistic. Nowhere did we find evidence for optimism. At first blush, the absence of any evidence of optimism seems inconsistent with the vast literature on relative risk estimates which finds that people believe they are less likely than others to experience negative events. The lack of optimism in Experiment 2 was at least partly due to the well-publicized disbursement error that occurred in the months prior to our experiment. However, the real billing error does not explain the absence of optimism in Experiments 1 and 3. We believe there are two reasons why we found no optimism in our experiments. The first reason is grounded in the controllability of the outcome. Past research finds that controllable events are particularly likely to elicit optimism (Harris, 1996). When an event is controllable, people have the power to influence the outcome in their favor, leading to optimistic expectations. This optimism is not limited to events that are actually controllable; if an uncontrollable event is somehow *perceived* as controllable, individuals will display optimism in their predictions (van der Velde, Hooykaas, & van der Pligt, 1992;

Weinstein, 1980). In the present experiments, however, the situation was clearly beyond participants' control. The error had already been detected, the registrar was aware of who was affected, and participants were offered no opportunity to influence their chances. Thus, their personal risk was made very clear, with little or no option of distorting their perceptions of control.

The second reason we may have found no evidence for optimism in personal predictions stems from the way we and past researchers have operationalized optimism, pessimism, and realism. Most researchers examine the risk estimates comparatively, by having participants rate their own and the average person's risk and then comparing the two ratings. People are optimistic if they rate their risk as significantly lower than the risk of the average person, they are pessimistic if they rate their risk as significantly higher than the risk of the average person, and they are realistic if they rate their risk as equal to the risk of the average person. The comparative approach to measuring predictions typically yields considerable optimism. We operationalized optimism, pessimism, and realism relative to the 25% base rate for receiving a bill. We defined optimism as predicting a probability significantly below 25%, pessimism as predicting a probability significantly above 25%, and realism as predicting a probability at 25%. Past research reveals little evidence for optimism in personal predictions when predictions are evaluated against a base rate. If anything, people appear to display a pessimistic bias in their predictions for others (see Taylor & Shepperd, 1998; Whitley & Hern, 1991).

Gains Versus Losses and Optimism

In the present research we conceptualized receiving a bill as a loss and receiving a reimbursement as a gain. Researchers investigating the relative risk estimates have investigated something akin to gains and losses in their study of people's estimates for positive and negative events. Examination of the literature suggests that the optimistic bias consistently occurs for negative events and sometimes occurs for positive events. For example, Weinstein (1980, 1982) found strong optimism for virtually all the negative events he examined (ranging from burglary to bronchitis). However, Weinstein reported optimism for some positive events (i.e., owning your own home, living past 80), yet realism for others (i.e., graduating in the top third of your class, having a constant weight for 10 years). Similar results emerge in other studies (e.g., Dewberry & Richardson, 1990; Pyszczynski, Holt, & Greenberg, 1987). This pattern of results may explain why researchers examining relative risk estimates have generally neglected examining positive events, and focused primarily on examining negative events.

For a variety of reasons, however, we believe that distinguishing between positive and negative events is problematic, making it difficult to draw conclusions. First, event importance and event valence are confounded. The negative events studied are typically far more consequential than the positive events. For example, many of the negative events in the literature hold tremendous power to alter one's life (i.e., car accident, cancer, divorce), while the positive events are rarely more extreme than a vacation abroad or a work-related award. Second, it is possible that many of the positive events examined in the optimistic bias literature are not necessarily perceived as positive by participants. Individuals often have strong expectations of experiencing certain life events. As a result, they do not regard the occurrence of these events as positive, but rather regard their failure to occur as negative or even as a loss. Many of the events included in the literature could fit this description.

We believe researchers investigating relative risk estimates would benefit from conceptualizing events as losses or gains, rather than as positive or negative, for two reasons. First, because the perceived valence of an event can depend on one's expectations, it can be difficult to assess whether an event is truly positive or negative. However, the status of an event as a loss or a gain is absolute, regardless of expectations. Second, conceptualizing events as losses or gains offers a simple solution to the importance-valence confound. The addition or removal of a commodity of a constant value allows event importance to be held constant, while event valence is manipulated.

Conclusions

We began with the hypothesis that personal predictions in anticipation of possible bad news vary as a function of personal needs, values, and desires. In the present experiments we operationalized need in terms of financial needs. A drawback of this series of experiments is that it examines only financial need. While examining financial need to the exclusion of other types of need may limit the generality of our findings, it has advantages in that it establishes a replicated paradigm for investigating the effect of need on predictions about the future and permits a comparison of the effect across experiments.

Importantly, we could have just as easily tested our hypothesis with regard to some other need. Presumably, anyone will brace in anticipation of an event that is regarded as a potential loss provided the need is sufficiently great and the consequences are perceived as impactful. For example, people who are high in their fear of failure may not only be more likely than people low in this fear to prepare for achievement tasks, but also more likely to brace in anticipation of receiving performance feedback. Or people who are chronically food deprived and starving may brace prior to opportunities to acquire food. After all, having high expectations and then being disappointed may make the hunger pains worse. Finally, people with particularly strong ego or esteem needs, for whom an interpersonal rejection would be particularly traumatic, may be more inclined toward pessimism in their predictions of the course of their interpersonal relationships. For these people it might be better to predict the worst, anticipating a partner's infidelity or relationship dissolving, than to be caught off guard and unprepared.

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