

# Protecting the Self From the Negative Consequences of Risky Decisions

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Three experiments tested the idea that a motive to protect self-esteem (SE) from the threat of regret can influence decision making. Threat to SE was manipulated by varying whether people expected to know the outcome of their decisions. Study 1 showed that when Ss expected feedback about their decisions, only Ss low in SE made regret-minimizing choices. Study 2 showed that when Ss did not expect to know the outcome of their decisions, SE differences in choice strategies disappeared. Study 3 manipulated expectations about feedback on chosen and unchosen alternatives and showed that the more feedback that was expected, the more likely low but not high SE Ss were to make regret-minimizing choices. These studies suggest that people base decisions not only on objective attributes of choice alternatives, but also on the damage to SE that is perceived to result from a poor-decision outcome.

Traditional theories of decision making assume, by and large, that people make decisions that reflect consistent evaluation of probabilities and outcome. The decision maker is seen to select, from among a set of alternatives, the one with the greatest expected value or utility. Unfortunately, numerous empirically documented violations of the axioms of expected utility (EU) theory (von Neumann & Morgenstern, 1944) have discredited its descriptive validity (e.g., Ellsberg, 1961; Kahneman & Tversky, 1979; Tversky, 1969). It is now generally accepted that people cannot maximize EU because of processing constraints (e.g., Simon, 1956) and cognitive biases (Tversky & Kahneman, 1986). A few theories of human decision making have proposed psychological processes underlying decision behavior, but these modifications focus primarily on perceptual and cognitive factors in information processing. The most influential of these theories has been Kahneman and Tversky's (1979) prospect theory.

Prospect theory challenges many of the fundamental assumptions of EU theory. Of most relevance here is prospect theory's attack on the assumption that people have an unchanging risk preference, commonly assumed to be risk aversion

(Kahneman & Tversky, 1979). *Risk aversion* is defined as the preference of a certain outcome (100% chance of occurrence) to a risky one (less than 100% chance of occurrence) of equal or greater expected value. A typical example of risk aversion is illustrated in a study by Tversky and Kahneman (1981) in which the majority of their subjects preferred a certain gain of \$800 to an 85% chance of gaining \$1,000. This finding suggests that most people prefer certainty to risk. What happens, however, when the sign of the payoff is reversed, that is, when losses replace gains? According to standard versions of EU theory, preferences should not be affected when the sign of the payoff changes. If certain gains are preferred to probabilistic gains, then certain losses should be preferred to probabilistic losses. Tversky and Kahneman's data present a different picture. Most of their subjects preferred an 85% chance of losing \$100 to a certain loss of \$80. This pattern of data, in which preference reverses as a function of changing the sign of the payoff, is called the *reflection effect* because the preference between negative prospects is the mirror image of the preference between positive prospects.

In spite of the serious challenges to EU theory posed by prospect theory, it is still the case that the decision literature has focused primarily on information processing factors underlying risk preference. It is only recently that several theories have begun to examine the psychological and emotional consequences of making decisions (Bell, 1982, 1985; Loomes & Sugden, 1982, 1986; Sugden, 1985). Loomes and Sugden's (1982) regret theory proposes that people do not simply combine probabilities and outcomes to arrive at an overall value for an alternative, as both EU theory and prospect theory assume. Instead, regret theory proposes that after a decision, people compare the outcome of the alternative they chose with the outcome that might have been if they had chosen another alternative. This comparison will lead either to feelings of regret or to rejoicing. Because people know that they experience these feelings after a decision, they take them into account while they are making a

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decision and try to make choices that minimize the amount of regret they will feel.

What affects an individual's anticipation of regret? We argue that whether a person expects to receive feedback regarding the outcome of a decision is a critical determinant in the anticipation of regret. When making a decision, one typically expects to receive feedback regarding the chosen alternative. For example, when submitting an article to a journal, an author expects the editor to inform the author of its fate at some future point. Sometimes the author expects to learn about both the outcome of the alternative chosen and the alternatives passed up. For example, although an author would never know the fate of an article had it been submitted to a less prestigious journal (it is prohibited by the American Psychological Association for an author to submit the same article for concurrent consideration by two or more journals), one always knows the fate of every possible numerical combination in a state lottery simply by virtue of knowing the winning number. This type of situation in which the decision maker is aware of information regarding both the chosen and unchosen alternatives has been investigated by Folger and his colleagues (Folger, 1984; Folger & Martin, 1986; Folger, Rosenfield, Rheame, & Martin, 1983). Folger et al. (1983) found that individuals experience the greatest level of discontent when they believe that their chances of obtaining a positive outcome from their chosen alternative is low and the chances of obtaining a positive outcome from an unchosen alternative is high. This rubbing-salt-in-the-wound effect is investigated in our third experiment.

A third type of decision scenario occurs once in a rare while when one faces a situation in which one does not expect to receive feedback regarding the outcome of a decision. Take, for example, the decision to create a last will and testament. One can imagine the consequences of shortchanging one child while heaping riches on another, but it would be folly to expect that one will be present to observe the outcome of this decision (unless, of course, one happens to believe in ghosts). We argue that these differences in expected feedback determine, in part, the amount of regret that is anticipated before a decision and, as a result, affect the choice strategies people use. For example, if people do not expect to know the results of their decisions, they do not face the possibility of having to cope with the regret that may result from a poor outcome (e.g., Brockner, 1979). We would predict that this type of situation may encourage a relatively high level of risk-taking behavior. On the other hand, when people expect to know how their decisions turned out, they are faced with the possibility of having to deal with the regret associated with a poor outcome. The possibility of regret is heightened further if people also expect to know the outcomes of the options they passed up, especially if these options are perceived as more likely than the chosen option (e.g., Folger et al., 1983). In general, we would predict that risk taking decreases as the potential for regret increases.

To this point, we have argued that for regret to be experienced, decision makers must expect some sort of feedback on the outcome of their decisions. But do all decision makers experience the same amount of psychological discomfort associated with regret? It is to this question that we now turn.

## Self-Esteem Protection

A number of theories have emerged proposing that people possess a system designed to maintain a level of global self-esteem that is sufficiently high to enable them to function effectively in their environments (e.g., Greenberg & Pyszczynski, 1985; Greenwald, 1980; Steele, 1988; Swann & Read, 1981; Taylor & Brown, 1988; Tesser, 1988). Steele, for example, argued that self-esteem defense in the face of threat can be accomplished by affirming an important self-value, even when it is unrelated to the threatened domain. In fact, by affirming a value in an unrelated domain, one is not burdened with typical defensive processes, such as denial and rationalization. A person can acknowledge the threat and subsequently place it into the bigger picture of the self. A good example of this process can be seen in Olympic figure skater Debi Thomas's reaction to her spill while performing in pursuit of an international gold medal. On failing in her quest, she sat down and said, "Oh well, I guess it's off to medical school." Thomas did not try to rationalize her failure and thus protect her self-worth by downgrading the importance of figure skating or attempting to pin the blame for her failure on external sources. Rather, she accepted her failure in a valued domain and parried with affirmation of another valued domain, albeit an unrelated one.

These value domains, we believe, make up a base of self-protective or esteem-maintaining resources and form the basis of a self-protective system, one function of which is to maintain self-esteem in the face of threat. Presumably, the more abundant and accessible these resources are, the easier it will be to cope with threats to the self, the less one has to fear from threats to the self, and the higher one's chronic level of self-esteem should be. If this reasoning is correct, then individuals with higher levels of self-esteem should be less affected by threats to the self. This is precisely what a substantial literature on reactions to self-threat indicates. Some of the more prominent findings include the following: Individuals high in self-esteem are more accepting of positive feedback and less accepting of negative feedback than are low self-esteem individuals (e.g., Brockner, 1979; Moreland & Sweeney, 1984); nondepressed, high self-esteem individuals underestimate the amount of negative feedback they have received (e.g., Nelson & Craighead, 1977); low self-esteem individuals are more likely to explain negative events using internal causes (e.g., Janoff-Bulman, 1979; Peterson & Seligman, 1984); low self-esteem individuals are prone to anxiety (Rosenberg & Simmons, 1972); and low self-esteem individuals are especially prone to feeling threatened (Leary, Barnes, & Griebel, 1986).

## Risky Decisions as Self-Esteem Threats

Risky decisions are potentially threatening to self-esteem because the chosen alternative will occasionally yield a less desirable outcome than would some other alternative. When a less desirable outcome does occur, it can sometimes lead people to doubt their judgment and ability, especially when the decision is an important one. However, as numerous investigators have demonstrated, self-esteem is an important variable in deter-

mining persons' ability to cope with threatening feedback. Persons low in esteem-maintaining resources will have difficulty combatting the threat posed by a failed decision and may experience damage to self-esteem. Thus, people with few self-protective resources should be particularly likely to make choices that minimize the possibility of regret as a means of protecting their self-esteem. Brockner, Derr, and Laing (1987), for example, found that after receiving negative feedback on an exam, low self-esteem subjects were unwilling to communicate managerial information to their colleagues in a simulated organization, presumably because they believed that this would risk their well-being in the organization. On the other hand, the risk-taking behavior of subjects high in self-esteem was relatively unaffected by negative feedback. Presumably, individuals high in self-esteem have abundant and easily accessible self-protective resources and can cope with threat more easily. Therefore, they may view a risky decision as an opportunity for a large payoff, rather than as a threat to self-esteem. In support of this logic, Tewari (1983) found that among female adolescents, self-esteem was strongly correlated with risk-taking tendencies.<sup>1</sup>

We predict that low self-esteem subjects will make choices that minimize the possibility of regret. When a positively framed decision involves choosing between a certain gain and a speculative gamble, the regret-minimizing strategy is to choose the certain gain over the gamble. By choosing the certain gain, subjects always win and never know whether the long shot would have paid off. In this case, ignorance is bliss. On the other hand, taking the gamble can be extremely regrettable, because, if it does not pay off, subjects end up with nothing, knowing that a modest amount could have been won for certain. In the case of decisions about losses, however, there is no clear regret-minimizing choice. If one chooses the sure loss, this is threatening: This represents a failure. On the other hand, if one chooses the risky gamble and it loses, knowing that the sure loss would have resulted in a better outcome would be regrettable. We suggest that there is pressure to avoid both the sure loss and the risky loss, thus making it unclear which of the two choices to adopt if one is motivated to minimize self-esteem threat. Therefore, we do not predict that there will be a marked preference for either choice in the pair, regardless of esteem level.

The pattern of choices we are predicting is substantially different than the pattern predicted by EU theory or prospect theory. Standard versions of EU theory predict that people will be either consistently risk-averse or consistently risk-seeking, regardless of the outcome frame. Prospect theory predicts that people will be risk-averse in gains and risk-seeking in losses. In addition to other factors that may influence risk preference, we predict that people who are susceptible to feeling regret will be more risk-averse in situations that expose them to the possibility of regret. We predict that low self-esteem people will be risk-averse when feedback on the outcome of their decision is expected. This should only occur in choices about gains, because in choices about losses, there is no clear threat-minimizing choice. On the other hand, high self-esteem subjects, who do not need to be concerned about regret, will be basically indifferent between the certain option and the gamble (both options have roughly the same expected value) for both gains and losses.

The following experiments were designed to test this logic. We wanted to see whether the choice strategies individuals used varied as a function of the amount of esteem-protective resources they possessed, as measured by the Rosenberg Self-Esteem Scale, and the situational potential to experience regret, which was manipulated by varying the expectation of feedback on the decision outcome.

### Overview of Experimental Procedures

In all 3 experiments, subjects were presented with the opportunity to play gambles for real money and to keep any money that they won. In the first 2 experiments, subjects were forced to choose among pairs of gambles varying in risk and payoff. Each gamble pair was composed of a sure thing and a speculative gamble of equal or roughly equal expected value. Half of the pairs were framed positively as gains (e.g., \$10 sure win vs. 50% chance of winning \$20), and half were framed negatively as losses (e.g., \$10 sure loss vs. 50% chance of losing \$20). In Study 3, subjects chose one gamble from a set of five, all of which were uncertain, positive, and of roughly equal expected value.

All of the subjects in Study 1 anticipated knowing the outcome of each option they chose from each gamble pair. In Study 2, feedback was manipulated. Half of the subjects expected to find out nothing about the outcomes of their decisions, and half the subjects expected to know the outcome of the option they chose from each gamble pair, as in Study 1. In Study 3, a different feedback manipulation was used. All subjects anticipated knowing the outcome of the option they chose; in addition, half the subjects anticipated knowing the outcomes of the options they passed up.

### Study 1

#### Method

*Subjects.* Approximately 1,500 University of Michigan undergraduate subject pool participants were given the 10-item Rosenberg Self-Esteem Scale at the beginning of the Fall 1988 semester. A quartile split was performed on the resulting scores, and a randomly selected subsample of the upper and lower quartiles was selected for participation in this experiment. In all, 78 subjects participated in this experiment. During the experimental procedures, the experimenter was blind to the subjects' level of self-esteem.

*Procedure.* After reading and then signing informed consent forms, all subjects were told that they would be participating in a study involving gambling for real money in which they could conceivably win in

<sup>1</sup> Is it the case that persons low in self-esteem only exhibit risk-averse tendencies when negative feedback from a failed decision is sufficiently self-relevant to result in actual damage to self-esteem? If this were true, then self-esteem should not predict risk preference in the majority of mundane, everyday decisions. It is probably more likely that low self-esteem individuals avoid risky situations not because the loss of a few dollars per se will inflict damage to self-esteem, but rather because the act of failing serves to reaffirm low self-esteem individuals' sense of themselves as incompetent losers. This possibility is quite similar to the Calvinist notion of *the select*, and although there is no literature that directly tests this idea, the logic behind it is consistent with the findings of Taylor and Brown (1988), Rosenberg and Simmons (1972), and Leary et al. (1986).

excess of \$100. Subjects were then presented with four pairs of positively framed prospects followed by four pairs of negatively framed prospects. The negatively framed prospects were identical to the positively framed prospects, except for having a different valence. Three of the four gambles pitted a certain outcome of \$8 against a gamble having a slightly higher absolute expected value (a typical pair of prospects pitted a sure thing of \$8 against a 66% chance of \$12). The fourth gamble pitted a high-probability outcome against a low-probability outcome. For each subject, order of presentation of the pairs was randomized within decision frame. If a subject chose the sure thing, the experimenter made a note of the subject's choice and moved on to the next pair. If the subject chose the risky prospect, the experimenter rotated a bingo drum containing 100 pieces (numbered 1-100), removed a piece, and recorded the number of the piece without letting the subject know the result. Subjects were told that this procedure would determine the outcome of their choice. If the number on the bingo piece was less than or equal to the stated probability of the risky prospect, the outcome of the prospect would occur. Subjects were told that they would get to see these outcomes at the end of the experiment, after they had made all of their choices. Subjects were further told that if their winnings exceeded their losses, they would be sent a check 7 days later. They were told that they would not be responsible for payment if losses exceeded winnings. After the four positive-prospect pairs were played, half of the subjects were told that they had won between \$20 and \$30. This was done to control for the possibility that self-esteem differences in estimates of money won in the four positive-prospect pairs could affect choice strategies in the negatively framed prospect pairs.

**Results**

Telling subjects that they had won a standardized amount of money, after the four positive-prospect pairs, had no effect on subsequent risk behavior so all subsequent analyses collapse across this variable. As predicted, low self-esteem subjects became significantly less risk-averse as the decision frame shifted from a positive to a negative frame,  $t(39) = 3.473, p < .01$ . In contrast, risk preference in high self-esteem subjects was not significantly affected by changes in the decision frame (see Table 1). This was additionally supported by a significant interaction in a 2 (self-esteem)  $\times$  2 (frame) analysis of variance

(ANOVA) in which decision frame made up the repeated measures variable,  $F(1, 77) = 11.33, p < .001$ .

*Positive prospects.* Collapsed across the four positively framed pairs of prospects, low self-esteem subjects were significantly less risk-seeking than were high self-esteem subjects,  $F(1, 77) = 18.67, p < .01$ .

*Negative prospects.* Collapsed across the four negatively framed pairs of prospects, no risk-seeking differences as a function of self-esteem were detected ( $F < 1.00$ ).

*Tests of the random decision strategy.* If subjects were randomly responding to each decision pair, one would expect them to choose, on the average, two risky prospects and two riskless prospects. It is possible, of course, to obtain self-esteem differences while simultaneously observing that one of the two groups does not differ significantly from chance in their decision strategies (for example, low self-esteem subjects could choose at random, choosing two risky prospects and two riskless prospects, whereas high self-esteem subjects could behave in an exclusively risk-seeking manner, choosing all four risky prospects). So we conducted a series of one-group  $t$  tests examining the mean differences between each group's degree of risk-seeking ability and the mean that would be expected if a group was responding randomly to each decision pair (in this experiment, this mean is equal to 2). When the prospect pairs were framed positively, high self-esteem subjects behaved significantly more risk-seeking than chance,  $t(38) = 2.43, p < .01$ , and low self-esteem subjects behaved significantly less risk-seeking than chance,  $t(39) = 3.73, p < .01$ . When prospect pairs were framed negatively, neither high nor low self-esteem subjects exhibited a degree of risk-seeking ability that was different from chance (both  $t$ s  $< 1$ ). It seems, then, that subjects both high and low in self-esteem exhibit the predicted decision strategies, but only when prospects are framed positively. We suggested that because there is no clear regret-minimizing strategy when prospects are framed negatively, subjects may resort to a willy-nilly response strategy, and indeed, it appears that this is the case.

*Optimism.* If high self-esteem subjects are more optimistic than low self-esteem subjects, then it could be that low self-esteem subjects are more risk-averse because they believe it less likely that risky positive prospects will pay off. To test this, we administered a life orientation test (LOT, Scheier & Carver, 1987), a measure of dispositional optimism, before subjects' playing the eight gambles. Although optimism was significantly related to self-esteem ( $b = .30, p < .01$ ), it did not predict risk taking ( $r < .10$ ). We also performed a median split on LOT scores and tested for any main effects or interactions with self-esteem on risk taking, testing these effects separately for positively and negatively framed prospects. None were found (all  $F$ s  $< 1$ ).

Table 1  
Mean Number of Risky Options Chosen  
by Self-Esteem and Gamble Frame

Self-esteem group	Gamble frame	
	Gain	Loss
HSE		
<i>M</i>	2.38	1.95
<i>SD</i>	0.99	1.17
LSE		
<i>M</i>	1.45	2.17
<i>SD</i>	0.93	1.13

Note. HSE = high self-esteem; LSE = low self-esteem. Means are the total number of risky options subjects chose from four pairs of gambles that pitted a certain outcome against a risky outcome. For both the HSE group and the LSE group,  $n = 40$ .

**Discussion**

Low self-esteem individuals behave in a way that suggests they are protecting themselves from threat. In positively framed prospects, the sure gain is a clear choice for those individuals motivated to protect themselves from self-esteem threats. We found that high self-esteem subjects were 50% more likely to choose the risky gain than were low self-esteem subjects. In

losses, the threat-minimizing choice is not clear. Both prospects within each pair can be viewed as threatening. Therefore, neither prospect within a pair should be preferred to the other by low self-esteem subjects. Our results support this expectation. Both high and low self-esteem subjects behaved as if they were indifferent to the element of risk when prospects were framed as losses, choosing the sure loss approximately 50% of the time and the gamble approximately 50% of the time.

It is clear that when prospects are framed positively, low self-esteem subjects take less risk than high self-esteem subjects. It is not clear that this is because of the anticipation of regret by low self-esteem subjects. The results of the first experiment suggest that optimism is not a viable alternative explanation for the esteem difference in risk taking, but other explanations for this difference may certainly exist, given that self-esteem is correlated with numerous personality variables. A stronger argument for the role of protection of self-esteem from threat in self-esteem differences in risk taking could be made by manipulating the threat that the outcome of a decision poses. If a given alternative carries with it the possibility of threat to self-esteem, then individuals having few self-protective resources (i.e., low self-esteem individuals) should tend to avoid this alternative. This is what was observed in Study 1 when low self-esteem subjects chose the sure gain over the risky gain. But what would happen if this threat were somehow removed from the decision environment? This could be done by telling subjects that they will never see the outcome of their decisions. The potential negative consequences of a decision should not influence decision makers if they believe they will never know the consequences of their decisions.

### Study 2

#### Method

In Study 2, we manipulated whether subjects would know the outcomes of their decisions. Subjects were either told that they would view the outcomes of each decision they made (identical to the instructions in Study 1) or told that they would never see the outcomes of any of their decisions. To fully insulate our no-feedback subjects from threat, all subjects were told that the amount of money they took home would not be the difference between their own winnings and losses; rather, all subjects would receive an amount equal to the total winnings averaged over all subjects who participated in the experiment. In this way, all subjects would still have an incentive to win as much money as possible (because the average amount won is influenced by each subject's total winnings or losses), and yet the no-feedback subjects would never know how they performed, either in individual choices or overall.

Our predictions for the second study are the following:

(a) We expect to replicate the findings of Study 1 when feedback is expected. When choosing among pairs of prospects framed positively, low self-esteem subjects should be more risk-averse than high self-esteem subjects. No esteem difference should arise when prospects are framed negatively.

(b) When the decision outcomes will not be known, there is presumably no threat. Therefore, differences in self-protective resources, as reflected in differences in self-esteem, should not play a role in risk preference. The result of this lack of threat should be that low self-esteem subjects become as risk-seeking as high self-esteem subjects in positively framed decisions. High self-esteem

subjects, protected as they are by an adequate store of resources, should not be affected by the removal of threat, because their preferences presumably were not affected by the presence of this threat.

*Subjects.* Screening procedures identical to the ones used in Study 1 were used here. In all, 86 subjects participated in the experiment.

*Procedure.* With the following exceptions, the procedure was identical to the one used in Study 1: Subjects, within levels of self-esteem, were randomly assigned to either the feedback or the no-feedback conditions. All subjects were told that they were playing for real money and that payment was going to be calculated on the basis of average winnings of all subjects participating in the experiment. The feedback subjects were told that after they played all of their gambles, the outcome of each of their choices would be made known to them. The no-feedback subjects were told that none of their decision outcomes would ever be made known to them. The experimenter was blind to feedback condition and the subjects' self-esteem scores.

Subjects were exposed to 20 pairs of prospects (10 gains and 10 losses) pitting a sure gain (loss) against a gamble offering a larger but risky gain (loss). The probabilities of risky outcomes ranged from .25 to .75. Within each pair, both options had an equal expected value, which was \$8 for half the positive pairs and \$12 for the other half (the sign was simply reversed for the negatively framed pairs).

#### Results

As may be seen in Table 2, when feedback was expected, low self-esteem subjects were significantly less risk-seeking in choices about gains than in choices about losses,  $t(19) = 5.75$ ,  $p < .01$ . High self-esteem subjects did not shift in their risk preference as a function of decision frame. These findings replicate the findings from Study 1. As predicted, when no feedback was expected, risk preference did not shift for either low or high

Table 2  
Mean Number of Risky Options Chosen by Self-Esteem, Feedback Condition, and Gamble Frame

Self-esteem group	Gamble frame	
	Gain	Loss
Feedback		
HSE		
<i>M</i>	6.29	6.65
<i>SD</i>	1.45	2.18
LSE		
<i>M</i>	3.54	5.91
<i>SD</i>	1.63	2.25
No feedback		
HSE		
<i>M</i>	5.08	5.80
<i>SD</i>	1.63	1.63
LSE		
<i>M</i>	5.88	6.12
<i>SD</i>	2.01	1.45

*Note.* HSE = high self-esteem; LSE = low self-esteem. Means are the total number of risky options subjects chose from 10 pairs of gambles that pitted a certain outcome against a risky outcome. For HSE/feedback,  $n = 17$ ; for LSE/feedback,  $n = 22$ ; for HSE/no feedback,  $n = 25$ ; and for LSE/no feedback,  $n = 25$ .

self-esteem subjects as a function of decision frame. These results were additionally confirmed in a 2 (feedback)  $\times$  2 (self-esteem)  $\times$  2 (frame) ANOVA with repeated measures on the frame variable, which yielded a significant three-way interaction,  $F(1, 85) = 5.48, p < .05$ .

As in Study 1, we tested each group individually to determine whether their pattern of choices differed significantly from the pattern that would arise if they chose at random. The only group of subjects whose choices were not different from what would be expected if they had chosen at random were the high self-esteem/not-expecting-feedback subjects when they were choosing among pairs of positively framed prospects. All other groups were significantly more risk-seeking than chance ( $t$ s between 2.19 and 3.85), except for the low self-esteem/expect-feedback group, when choosing among pairs of positively framed prospects,  $t(19) = 4.38, p < .001$ .<sup>2</sup>

### Discussion

When subjects expected to know the outcomes of their decision (essentially a replication of the condition used in Study 1), we obtained results that were quite similar to those found in Study 1. Low self-esteem subjects were more risk-averse than high self-esteem subjects when decisions were framed positively. When framed negatively, all esteem differences vanished. We believe this shows that low self-esteem subjects, who are less able to deal with the possibility of a poor decision outcome, make decisions that minimize the potential for regret. All differences between low self-esteem subjects and high self-esteem subjects disappear in the absence of feedback. If the low self-esteem subjects were not confronted with the possibility of seeing themselves making a mistake, then they were just as risk-seeking as high self-esteem subjects.

Compared with Study 1, subjects in this study were, in general, slightly—but nonetheless significantly—risk-seeking when choosing between negatively framed prospects. Recall, in Study 1, that subjects chose the riskless prospects approximately 50% of the time. Study 2 differed from Study 1 in that subjects were exposed to twice as many prospect pairs as were subjects in Study 1. In addition, half of our subjects believed that their choices would never be known to them. It seems quite plausible that this knowledge may have served to disinhibit normally risk-averse subjects and, as a result, may have contributed to this slight overall increase in risk seeking.

The results of Study 2 strongly suggest that the threat of damage to self-esteem accounts for the esteem difference in risk taking seen in choices involving gains. We have shown that when low self-esteem subjects expect to know the outcomes of their decisions, they modify their decision strategies in a way that minimizes the possibility of regret. In the absence of feedback, however, they make the same choices as do high self-esteem subjects. This pattern of results also lends further credence to the notion that dispositional differences in optimism do not account for our effects. It seems unlikely that the absence of feedback on one's decisions would bolster one's optimism regarding the outcome of the decisions. There is no literature to support such a position, nor is such an explanation intuitively appealing.

### Study 3

Study 3 further explores the role of feedback in decision making by examining in more detail how the anticipation of feedback about foregone alternatives affects choice strategies. Recall that subjects in the feedback condition of Study 2 were told only that they would find out the outcome of the option they chose; they were told nothing about receiving feedback on foregone options. Note, however, that feedback about the foregone alternative was implicitly available if subjects took the gamble and was implicitly unavailable if subjects took the certain gain. That is, subjects who chose the gamble expected to know the result of the foregone option (it was a certainty), but subjects who chose the certain option expected the outcome of the foregone gamble to remain a mystery. We argue that the potential for regret increases when a decision maker expects to receive feedback on foregone alternatives; in fact, this is part of the pressure that makes low self-esteem subjects favor a certain, small gain to a risky, large gain.

In Study 3, we manipulated the anticipation of regret by varying subjects' expectations about feedback on foregone alternatives. Unlike Study 2, all subjects expected to receive feedback on the option they selected to play; in addition, half of the subjects also expected to receive feedback on the option or options they passed up. We predict that as a result of anticipating a poor outcome, low self-esteem subjects will revert to their protective, risk-averse choice strategies when they expect feedback on foregone alternatives (which we call the *foregone-feedback condition*). On the other hand, when low self-esteem subjects expect to know the outcome of the option they chose but not the foregone option (which we call the *own-choice feedback condition*), we predict that low self-esteem subjects will be more willing to take the long shot, and their choices should be little different from those made by high self-esteem subjects. We predict that high self-esteem subjects in the expect-feedback condition will neither be risk-averse nor avoid feedback on foregone alternatives, because they are not threatened by the possibility of making a poor decision. In fact, we contend that high self-esteem subjects can use the decision task to enhance their self-image and therefore will take risks and will seek feedback on their decisions. When there is no expectation of feedback on foregone alternatives, we predict that low self-esteem and high self-esteem subjects will show the same pattern of choices.

### Method

Subjects were given the opportunity to choose one gamble from a set of five to be played for actual money at the end of the experiment. In addition, subjects were told that their choice would be known only to themselves and to the experimenter, who would determine the outcome with them privately. Subjects knew that they could not lose any money and that whatever amount they won they could keep for themselves. The five gambles presented to the subjects are shown in Table 3. The gambles consisted of two that had a high probability of a small gain, two that had a moderate probability of a medium gain, and one that had a low probability of a large gain. All of the gambles had

<sup>2</sup> This was the only group that was predicted to exhibit a risk-averse pattern of choices.

Table 3  
Proportion of Subjects Choosing Each Gamble Alternative

Feedback condition	A1: High prob	A2: Mod prob	B1: High prob	B2: Mod prob	B3: Low prob	Total	<i>n</i>
Foregone-feedback							
LSE	.32	.11	.25	.14	.18	1.00	28
HSE	.05	.05	.35	.05	.50	1.00	20
Own-choice feedback							
LSE	.14	.18	.18	.14	.36	1.00	28
HSE	.16	.08	.08	.24	.44	1.00	25

*Note.* Foregone-feedback means that subjects expected to find out the outcome of the gamble they chose and the outcome or outcomes of the gamble or gambles they passed up in the set (A or B) from which they selected their gamble. Own-choice feedback means that subjects expected to find out just the outcome of the gamble they chose. HSE = high self-esteem; LSE = low self-esteem; A1, A2, B1, B2, and B3 = gambles presented to subjects; High prob = high-probability/small-gain gamble; Mod prob = moderate-probability/medium-gain gamble; and Low prob = low-probability/large-gain gamble.

roughly the same expected value, and the high-probability gambles were designed to be almost indistinguishable from each other, as were the moderate-probability gambles. All of the subjects received the gambles in the following format (excluding the parenthetical comments):

Which of the following five gambles would you most like to play?

*Set A*

A1: 95% chance of winning \$2.10 (high probability/small gain\*).

A2: 60% chance of winning \$3.10 (moderate probability/medium gain\*).

*Set B*

B1: 90% chance of winning \$2.30 (high probability/small gain\*\*).

B2: 55% chance of winning \$3.40 (moderate probability/medium gain\*\*).

B3: 25% chance of winning \$8 (low probability/large gain).<sup>3</sup>

The subjects in the foregone-feedback condition were told to select one of the gambles to play at the end of the experiment. In addition, they were told that there were two sets of gambles, A and B, and that from whichever set they chose their gamble, they would find out the outcomes of all of the other gambles within that set but would not see the outcomes of any of the gambles from the other set. For example, if a subject chose A1, A1 would be played in front of the subject to see if it won any money for the person, and A2 would be played just to see what would have happened if it had been chosen instead. None of the gambles from Set B would be played. The subjects in the own-choice feedback condition were told to ignore the A and B labels and to select one of the gambles to play at the end of the experiment. They did not expect to receive feedback on the alternatives they passed up.

There are two choice strategies that can be used to reduce the possibility of feeling regret in the foregone-feedback condition. The first is to choose a high-probability/small-gain gamble. The second is to choose a gamble from Set A and not Set B, so as to avoid the possibility of seeing the long shot pay off. The gamble that poses the least chance for leading to regret is A1, and the gamble that poses the most chance is B3. We predict that (a) in the foregone-feedback condition, low self-esteem subjects will be more likely to pick A1 and less likely to pick B3 than will high self-esteem subjects and (b) in the own-choice feedback condition, high self-esteem and low self-esteem subjects will have essentially the same pattern of choices.

*Subjects.* The subjects were 101 undergraduates from the introductory psychology pool at the University of Michigan (55 women and 46 men). Subjects in the entire pool were administered the Rosenberg Self-Esteem Scale at the beginning of the term, and the participants were selected from the top third and the bottom third of the distribu-

tion. Fifty-six of the participants scored in the bottom third, and 45 of the participants scored in the top third. During the experimental session, the experimenter was blind to the subjects' level of self-esteem.

*Procedure.* All subjects spent approximately 15 min completing a decision-making questionnaire. Subjects in the own-choice feedback condition then read the following written information, which was also summarized orally by the experimenter:

We have now come to the part of the study that involves actual decisions. Listed below are five different gambles, which vary with respect to probability of success and payoff. You will be allowed to pick one of the five options. At the end of the study, the experimenter will play the gamble each person chose with that person individually. If you win the gamble, you will actually win the payoff. Of course, it costs *nothing* to play the gambles, so you cannot lose any money. You can only win.

The five gambles were listed below the instructions. Subjects were then shown how the outcome of the gamble they chose would be determined using a bingo drum, which contained the numbers between 1 and 100. The example that was used to illustrate the procedure was Gamble B3, a 25% chance of winning \$8. Subjects were told that if the number that came up was between 1 and 25, then they would win \$8; a number greater than 25 would win nothing. The gamble was always shown to win nothing to increase the salience of regret. Subjects were then asked to pick one of the gambles to play for actual money.

Subjects in the foregone-feedback condition read the introductory remarks, and before seeing the demonstration, they read the following:

There are two sets of gambles listed below. When it is your turn to play the gambles, *all of the gambles* in the set from which you chose your gamble will be played and none of the gambles from the other set will be played. Thus, you will find out not only whether you won any money, but also whether you would have won if you had chosen one of the other gambles. For instance, if you pick A2, both A1 and A2 will be played. A2 will be played for money and A1 just to see how it would have turned out. Note that if you chose a gamble from Set A, *none* of the gambles in the B set will be played. On the other hand, if you chose a gamble from the

<sup>3</sup> Half the subjects received the single-asterisked options in Positions A1 and A2 and the double-asterisked options in Positions B1 and B2 as shown. The other half received single-asterisked options in Positions B1 and B2 and the double-asterisked options in Positions A1 and A2.

B set, all of the B gambles will be played and *none* of the A gambles will be played.

As was the case with the other condition, the gambling procedure was explained and illustrated, using gamble B3, which was shown to lose. The experimenter then pointed out that the other two gambles (B1 and B2) would have also been played in the actual game. Subjects were then asked to pick one of the gambles to play for actual money.

After everyone had chosen a gamble, the experimenter collected all of the responses and called the subjects individually into another room in which the gambles were played.

## Results

We expected to find that low self-esteem subjects would be more risk-averse and more likely to choose from Set A than would high self-esteem subjects, but only in the foregone-feedback condition. We expected no differences between low self-esteem and high self-esteem subjects in the own-choice feedback condition. A log-linear analysis indicated that the three-way interaction among self-esteem, feedback, and alternative was not significant,  $\chi^2(4, n = 101) = 7.43, p < .12$ . However, as may be seen in Table 3, low self-esteem subjects in the foregone-feedback condition were the most likely to choose A1, which was chosen by 32%, and the least likely to choose B3, which was chosen by 18%, compared with the subjects in the other three conditions. This pattern of choice stands in marked contrast to that of the high self-esteem subjects in the foregone-feedback condition: Only a scant 5% chose A1 and an overwhelming 50% chose B3. The choices made by low self-esteem subjects were significantly different from the choices made by high self-esteem subjects,  $\chi^2(4, n = 48) = 9.81, p < .05$ . On the other hand, the low self-esteem and high self-esteem subjects in the own-choice feedback condition had almost identical patterns of choices, which were not significantly different,  $\chi^2(4, n = 53) = 2.85, ns$ . The proportion choosing Option A1 was almost identical between the low self-esteem and high self-esteem subjects (.16 and .12, respectively; see the Appendix for additional information). The modal response was the long shot, B3, which was chosen by 36% of the low self-esteem subjects and by 44% of the high self-esteem subjects.

In the foregone-feedback condition, low self-esteem subjects were more likely than high self-esteem subjects to pick a gamble from Set A (which was the set that did not contain the long shot) and were more likely to be risk-averse (preferring the high-probability gambles to the other gambles). Table 4 shows that collapsing across gamble type, low self-esteem subjects in the foregone-feedback condition were more likely to choose a gamble from Set A than were high self-esteem subjects,  $\chi^2(1, n = 48) = 4.61, p < .05$  (after Yate's correction). The choices made by low self-esteem and high self-esteem subjects were not significantly different in the own-choice feedback condition,  $\chi^2(1, n = 53) = 0.12, ns$ . Table 5 shows that collapsing across gamble set, low self-esteem subjects in the foregone-feedback condition were much less likely to choose the low-probability/large-gain option than were high self-esteem subjects,  $\chi^2(2, n = 48) = 5.94, p < .05$ . There was no significant difference between the choices made by low self-esteem and high self-esteem subjects in the own-choice feedback condition,  $\chi^2(2, n = 53) = 0.54, ns$ .

## Discussion

The anticipation of learning about the outcomes of foregone alternatives substantially altered subjects' choices as a function of their self-protective resources. When low self-esteem subjects anticipated learning about the outcomes of foregone alternatives, they were less likely to take a chance on a long shot than were high self-esteem subjects. In addition, they were more likely than were high self-esteem subjects to choose the high-probability/small-gain option (A1) that shields them from learning whether the foregone long shot (B3) would have won. In fact, high self-esteem subjects who did not choose the long shot unexpectedly took the high-probability/small-gain gamble (B1) that allowed them to find out about the foregone long shot. This curiosity effect is consistent with the view that high self-esteem subjects are not intimidated by the possibility of regret. When subjects expected to learn just about the outcome of their own choice, there were no differences between the choices of low and high self-esteem subjects.

## General Discussion

In a series of three experiments, we have demonstrated that under conditions in which the outcome of making a positively framed risky decision can result in threat to self-esteem, individuals low in self-esteem take less risk than individuals high in self-esteem. We believe this occurs because people who are low in self-esteem lack the self-protective resources needed to defend against threats to self-esteem. When these threatening conditions are removed from the decision situation, the esteem differences vanish. Specifically, low self-esteem subjects become as risk-seeking as high self-esteem subjects. This result was demonstrated in Study 2 and in Study 3.

We have also shown that an important situational factor that affects the decisions people make is the amount of feedback they expect to receive on their decisions. Will they know how the option they chose turned out? Will they know how the option they passed up turned out? These factors lead people who are concerned with threats to their decision-making competence to modify their choice strategies in predictable ways. In general, they become more risk-averse in the face of threat, thereby reducing the possibility of regretting their decisions. We believe this shows that an important process that underlies risk aversion is the anticipation of regret and the desire to maintain self-esteem. These findings highlight important aspects of the motivational process underlying risk aversion that have been neglected by standard cognitive theories of choice.

Although the results obtained in the three studies reported in this article are consistent with a self-esteem protection argument, we feel obligated to temper our enthusiasm regarding the role of self-esteem in decision processes with several caveats. The most important of these caveats arises from the fact that self-esteem is not manipulated in any of the studies. Because self-esteem is correlated with numerous other personality variables (optimism, social anxiety, and self-consciousness, just to name a few), we hesitate to argue too strongly for the specific role of a self-esteem protective motive in risky decision making. Instead, it seems more prudent at this time to suggest self-es-



Table 4  
*Proportion of Subjects Selecting a Gamble From Each Gamble Set (A vs. B), Collapsing Across Gamble Type (High Prob, Mod Prob, and Low Prob)*

Feedback condition	Set A	Set B	Total	<i>n</i>
Foregone-feedback				
LSE	.43	.57	1.00	28
HSE	.10	.90	1.00	20
Own-choice feedback				
LSE	.32	.68	1.00	28
HSE	.24	.76	1.00	25

*Note.* Foregone-feedback means that subjects expected to find out the outcome of the gamble they chose and the outcome or outcomes of the gamble or gambles they passed up in the set (A or B) from which they selected their gamble. Own-choice feedback means that subjects expected to find out just the outcome of the gamble they chose. HSE = high self-esteem; LSE = low self-esteem; High prob = high-probability/small-gain gamble; Mod prob = moderate-probability/medium-gain gamble; and Low prob = low-probability/large-gain gamble.

teem protection as a working model of risky choice until (a) the manipulation of self-esteem is shown to affect risk preference and (b) other personality variables are ruled out as predictors of risk preference.

Although it has been demonstrated that self-esteem and outcome feedback affect risk preference, the process or set of processes underlying these effects is still unclear. We have argued that under certain conditions, individuals will act in a self-esteem protective manner, but we have no direct evidence that this is in fact why low self-esteem persons are risk-averse when expecting feedback about their decisions. Quizzing subjects as to the reasons behind their decisions may appear to be a simple solution to this problem, but there is good reason to believe that individuals do not have access to the processes underlying their behaviors (e.g., Nisbett & Wilson, 1977), especially when behavior involves protecting self-esteem from psychological threat (e.g., Freud, 1937). In spite of these reservations, we would remind the reader that the evidence presented in this article was not simply culled from the results of correlating self-esteem with risk preference. By manipulating feedback regarding the

chosen and foregone-decision alternatives in Studies 2 and 3, we obtained experimentally manipulated evidence implicating the role of self-esteem protection in risk preference. Thus, although we have no evidence that directly and unequivocally points to the role of self-esteem protection in risk preference, we prefer a self-esteem protection explanation to any other that has been suggested to date.

#### *Implications for Standard Theories of Choice*

We found almost no support for the standard EU assumption that people display a consistent risk preference. According to standard EU theory, people who prefer the risky option in choices involving gains should prefer the risky option in choices involving losses, and people who shun the risky option in one frame should do so for the other. However, we found no significant positive correlations between choices in gains and in losses in either Study 1 or Study 2 (Study 3 involved only choices about gains).

We found some support for the prospect theory prediction

Table 5  
*Proportion of Subjects Selecting a Gamble From Each Gamble Type (High Prob, Mod Prob, and Low Prob), Collapsing Across Gamble Set (A vs. B)*

Feedback condition	High prob	Mod prob	Low prob	Total	<i>n</i>
Foregone-feedback					
LSE	.57	.25	.18	1.00	28
HSE	.40	.10	.50	1.00	20
Own-choice feedback					
LSE	.32	.32	.36	1.00	28
HSE	.24	.32	.44	1.00	25

*Note.* Foregone-feedback means that subjects expected to find out the outcome of the gamble they chose and the outcome or outcomes of the gamble or gambles they passed up in the set (A or B) from which they selected their gamble. Own-choice feedback means that subjects expected to find out just the outcome of the gamble they chose. HSE = high self-esteem; LSE = low self-esteem; High prob = high-probability/small-gain gamble; Mod prob = moderate-probability/medium-gain gamble; and Low prob = low-probability/large-gain gamble.

that people are risk-averse when choices are framed positively and risk-seeking when choices are framed negatively. This was the approximate pattern of results we obtained for low self-esteem subjects who were making choices under self-esteem threatening conditions. Unfortunately, we are not able to address the issue of the relative contributions of motivational versus cognitive processes in choice strategies. To a certain extent, one process may reinforce the other. For example, when the outcomes are of a large enough magnitude, a poor decision will pose a threat to everyone, regardless of self-protective resources. For instance, most people would deeply regret passing up a certain gain of \$3,000 if they took a gamble on winning \$4,000 and came away with nothing. The feeling of regret would be intensified further if, as prospect theory proposes, the subjective difference between large outcomes is smaller than the subjective difference between small outcomes. The net result would be that a large outcome, such as \$4,000, would not be valued much more than an outcome of \$3,000, and the threat of passing up \$3,000 for sure to take a gamble on \$4,000 would make most people risk-averse. Thus, both motivational and cognitive factors may combine to make everyone risk-averse for large outcomes.

### *Self-Esteem, Risk Aversion, and Life-Style*

We have argued that protection of self-esteem is often very important to people when they face risk. This argument, however, seems more valid for low self-esteem people than for those high in self-esteem. After all, the behavior of our high self-esteem subjects gave us no indication that they were protecting their self-esteem. Could it be that high self-esteem individuals have no need to avoid risk to protect self-esteem? This seems unlikely, although we would argue that payoffs of small to moderate value in fact do not pose a threat to high self-esteem people. We would argue that when the value of a payoff becomes sufficiently important, even high self-esteem people will be concerned with esteem protection. The values of most everyday decisions, however, are probably more in line with the values of our experimental prospects. This suggests that low self-esteem people are probably much more concerned with self-esteem protection on an everyday basis than are high self-esteem people. As mentioned in Footnote 1, this concern may arise from the threat that a poor decision—*independent of the importance of the decision*—poses for low self-esteem people. If this is the case, then a decision resulting in the loss of \$5 may be interpreted by low self-esteem individuals as yet another example of poor decision making, but may be thought of as a good decision gone bad by high self-esteem people. This type of mentality is consistent with the finding that high self-esteem individuals make external attributions for failure and internal attributions for success, whereas low self-esteem individuals do just the opposite (e.g., Greenwald, 1980). To the person high in self-esteem, then, the world is an oyster bed of opportunities to enhance themselves, but to the person low in self-esteem, it is a minefield that can humiliate and depress.

One interesting implication of our findings is that low self-esteem subjects' need to protect their self-esteem may set in motion a vicious cycle that ultimately reinforces their low self-

esteem. If low self-esteem subjects choose a certain gain when risky alternatives have a greater expected gain, they will, over time, fare less well than someone less threatened by risk. As a result, they will have protected themselves against threat from moment to moment, but they may—through social comparison—come to feel less adequate than more successful people. This type of attitude toward risk may help to explain the well-documented correlation between low self-esteem and depression.

We do not, however, wish to paint an overly pessimistic picture of the consequences of self-esteem protection. We would argue that there are also situations in which concern with poor decision outcomes may lead to adaptive behavior. For instance, people with low self-esteem are more likely than people with high self-esteem to vary their strategies and to seek information when confronted with negative outcomes (Knight & Nagel, 1986; Weiss & Knight, 1980). This may be particularly advantageous within the context of a series of decisions in which additional information may be helpful in preventing failure in future decisions.

Since the official birth of the information processing revolution in the mid-1950s, the field of psychology has tended to view the human being as a cold and dispassionate information processor, and as a result, hot constructs, such as ego protection and emotion, have been relegated to second-class status. This has certainly been the case in the study of decision processes. Although it would be a mistake to advocate one particular approach to the study of human decision processes, the results of the studies reported in this article suggest that the incorporation of theory and ideas from several different psychological traditions can result in progress toward the understanding of human decision making.

### References

- Bell, D. E. (1982). Regret in decision making under uncertainty. *Operations Research*, 30, 961-981.
- Bell, D. E. (1985). Disappointment in decision making under uncertainty. *Operations Research*, 33, 1-27.
- Brockner, J. (1979). The effects of self-esteem, success-failure, and self-consciousness on task performance. *Journal of Personality and Social Psychology*, 37, 1732-1741.
- Brockner, J., Derr, W. R., & Laing, W. N. (1987). Self-esteem and reactions to negative feedback: Toward greater generalizability. *Journal of Research in Personality*, 21, 318-333.
- Ellsberg, D. (1961). Risk, ambiguity, and the Savage axioms. *Quarterly Journal of Economics*, 75, 643-699.
- Folger, R. (1984). Perceived injustice, referent cognitions, and the concept of comparison level. *Representative Research in Social Psychology*, 14, 88-108.
- Folger, R., & Martin, C. (1986). Relative deprivation and referent cognitions: Distributive and procedural justice effects. *Journal of Experimental Social Psychology*, 22, 531-546.
- Folger, R., Rosenfield, D., Rheume, K., & Martin, C. (1983). Relative deprivation and referent cognitions. *Journal of Experimental Social Psychology*, 19, 172-184.
- Freud, A. (1937). *The ego and the mechanisms of defence*. London: Hogarth Press.
- Greenberg, J., & Pyszczynski, T. (1985). Compensatory self-inflation: A response to the threat to self-regard of public failure. *Journal of Personality and Social Psychology*, 49, 273-280.

- Greenwald, A. G. (1980). The totalitarian ego: Fabrication and revision of personal history. *American Psychologist*, *35*, 603–618.
- Janoff-Bulman, R. (1979). Characterological versus behavioral self-blame: Inquiries into depression and rape. *Journal of Personality and Social Psychology*, *37*, 1798–1809.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of decision under risk. *Econometrica*, *47*, 263–291.
- Knight, P. A., & Nagel, J. I. (1986). Humility revisited: Self-esteem, information search, and policy consistency. *Organizational Behavior and Human Decision Processes*, *38*, 196–206.
- Leary, M. R., Barnes, B. D., & Griebel, C. (1986). Cognitive, affective, and attributional effects of potential threats to self-esteem. *Journal of Social and Clinical Psychology*, *4*, 461–474.
- Loomes, G., & Sugden, R. (1982). Regret theory: An alternative theory of rational choice under uncertainty. *Economic Journal*, *92*, 805–824.
- Loomes, G., & Sugden, R. (1986). Disappointment and dynamic consistency in choice under uncertainty. *Review of Economic Studies*, *53*, 271–282.
- Moreland, R. L., & Sweeney, P. D. (1984). Self-expectancies and reactions to evaluations of personal performance. *Journal of Personality*, *52*, 156–176.
- Nelson, R. E., & Craighead, W. E. (1977). Selective recall of positive and negative feedback, self-control behaviors, and depression. *Journal of Abnormal Psychology*, *86*, 379–388.
- Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, *84*, 231–259.
- Peterson, C., & Seligman, M. E. (1984). Causal explanations as a risk factor for depression: Theory and evidence. *Psychological Review*, *91*, 347–374.
- Rosenberg, M., & Simmons, R. G. (1972). *Black and white self-esteem: The urban school child*. Washington, DC: American Sociological Association.
- Scheier, M. F., & Carver, C. S. (1987). Dispositional optimism and physical well-being: The influence of generalized outcome expectancies on health. *Journal of Personality*, *55*, 169–210.
- Simon, H. A. (1956). Rational choice and the structure of the environment. *Psychological Review*, *63*, 129–138.
- Steele, C. M. (1988). The psychology of self-affirmation: Sustaining the integrity of the self. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 21; pp. 261–302). San Diego, CA: Academic Press.
- Sugden, R. (1985). Regret, recrimination and rationality. *Theory and Decision*, *19*, 77–99.
- Swann, W. B., Jr., & Read, S. J. (1981). Self-verification processes: How we sustain our self-conceptions. *Journal of Experimental Social Psychology*, *17*, 351–370.
- Taylor, S. E., & Brown, J. D. (1988). Illusion and well-being: Some social psychological contributions to a theory of mental health. *Psychological Bulletin*, *103*, 193–210.
- Tesser, A. (1988). Toward a self-evaluation maintenance model of social behavior. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 21; pp. 181–227). San Diego, CA: Academic Press.
- Tewari, G. (1983). Risk-taking tendencies as correlates of self-esteem, aspiration, and deviancy. *Perspectives in Psychological Research*, *6*, 91–97.
- Tversky, A. (1969). Intransitivity of preferences. *Psychological Review*, *76*, 31–48.
- Tversky, A., & Kahneman, D. (1981). The framing of decisions and the psychology of choice. *Science*, *211*, 453–458.
- Tversky, A., & Kahneman, D. (1986). Rational choice and the framing of decisions. *Journal of Business*, *59*, S251–278.
- von Neumann, J., & Morgenstern, O. (1944). *Theory of games and economic behavior*. Princeton, NJ: Princeton University Press.
- Weiss, H. M., & Knight, P. A. (1980). The utility of humility: Self-esteem, information search, and problem-solving efficiency. *Organizational Behavior and Human Performance*, *25*, 216–223.

Appendix

Note that the A1 versus B1 and the A2 versus B2 distinctions are meaningless in the own-choice feedback condition, because set labels are irrelevant and specific gambles are counterbalanced. The differences between A1 and B1 and between A2 and B2, therefore, are due to random fluctuation. Thus, a more stable estimate of preferences for the

high-probability/small-gain gamble and for the moderate-probability/medium-gain gamble in the own-choice feedback condition could be obtained by averaging the proportions selecting A1 and B1 and the proportions selecting A2 and B2. The resulting averages for the subjects in the own-choice feedback condition are presented in Table A1.

Table A1  
*Averages for Subjects in the Own-Choice Feedback Condition*

Self-esteem group	A1: High prob	A2: Mod prob	B1: High prob	B2: Mod prob	B3: Low prob
Low	.16	.16	.16	.16	.36
High	.12	.16	.12	.16	.44

Note. A1, A2, B1, B2, and B3 = gambles presented to subjects; High prob = high probability/small-gain gamble; Mod prob = moderate-probability/medium-gain gamble; Low prob = low-probability/large-gain gamble.

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