When Ego Threats Lead to Self-Regulation Failure: Negative Consequences of High Self-Esteem

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The tendency for people with high self-esteem to make inflated assessments and predictions about themselves carries the risk of making commitments that exceed capabilities, thus leading to failure. Ss chose their performance contingencies in a framework where larger rewards were linked to a greater risk of failure. In the absence of ego threat, Ss with high self-esteem showed superior self-regulation: They set appropriate goals and performed effectively. Ego threat, however, caused Ss with high self-esteem to set inappropriate, risky goals that were beyond their performance capabilities so they ended up with smaller rewards than Ss with low self-esteem. The results indicate the danger of letting egotistical illusions interfere with self-regulation processes.

The capacity to adjust one's actions and strivings according to a wide variety of complex, abstract, and distant circumstances is an important key to human nature. In recent years, researchers have begun to turn increasing attention to the study of self-regulation. The majority of these efforts have focused on fundamental processes of self-regulation, such as managing attention (Derryberry & Rothbart, 1988; Gilbert, Krull, & Pelham, 1988; Kosson & Newman, 1989; Mikulincer, 1989; Miller, 1987), delay of gratification (Mischel, Shoda, & Peake, 1988), feedback loops (Carver, 1979; Carver & Scheier, 1981, 1982; Hyland, 1988), persistence (Elliott & Dweck, 1988; Kernis, Zuckerman, Cohen, & Spadafora, 1982; Rosenbaum & Ben-Ari, 1985; Tomarken & Kirschenbaum, 1982), controlling one's thoughts (Goodhart, 1986; Hatvany & Strack, 1980; Neuberg, 1989; Wegner, 1989; Wegner, Schneider, Carter, & White, 1987), altering one's emotional states (Hochschild, 1983; Mayer & Gaschke, 1988; Nasby & Yando, 1982; Reich & Zautra, 1981; Tice & Baumeister, in press; Wenzlaff, Wegner, & Roper, 1988), managing performance processes (Baumeister, 1984; Dickman & Meyer, 1988; Heckhausen & Strang, 1988; Vallacher, Wegner, & Frederick, 1987), and stifling impulses (Engebretson, Matthews, & Scheier, 1989; Kernis, Grannemann, & Barclay, 1989; Patterson, Kosson, & Newman, 1987; Pennebaker & Chew, 1985; Polivy, 1990; Winter, 1988; Zinbarg & Revelle, 1989). Although these fundamental processes are unquestionably the logical place to begin the study of self-regulation, there are also

more complex forms that may require not only multiple processes but also the coordination of multiple processes, such as in the link between plan making and performing (e.g., Bandura & Schunk, 1981; Kirschenbaum, Tomarken, & Ordman, 1982). The present research explores one of these complex forms of self-regulation, namely, self-management (see also Sternberg, 1988; Wagner & Sternberg, 1985).

Success in life often apparently entails the making and keeping of appropriate commitments (e.g., Vaillant, 1977). Such success often cannot be reduced to one psychological mechanism. Rather, it appears to involve several parts. First, one must assess the self's capacities and the environmental opportunities. Second, one must make a commitment that offers a high probability of both success and satisfaction. Third, one must then perform up to one's obligations. The level of difficulty of the performance stage depends on what commitment was made in the goal-setting stage. Successful self-management thus depends on the effective coordination of these multiple self-regulation processes.

A particular interest of the present investigation was in the role of self-esteem in self-regulation. Although high self-esteem is generally considered to be a desirable, adaptive state, it may have drawbacks when effective self-management requires accurate assessment of self. If people allow highly favorable self-views to influence their decisions, they may end up committing themselves to overly high goals, thereby increasing their likelihood of failure. Of course, if they are capable of reaching these higher goals, then there is nothing wrong with setting them. Failure is rooted in the coordination between the several parts of the self-management task, such as if the individual sets goals that he or she is then unable to reach.

Placing Obligations on Oneself

Although a great deal of self-regulation is involved in responding to situations, it is important to recognize that self-regulation can also influence the decision about whether to enter into various situations or not in the first place. Indeed, Snyder (1988) suggested that the consistency of personality structures can best be seen in the selection of situations to enter (which

consistency is therefore obscured by the social psychological focus on how individuals respond to situations once they are in them; see also Emmons & Diener, 1986; Emmons, Diener, & Larsen, 1986). If that view is correct, then selection of situations should be regarded as one of the most important arenas for personality psychology to study.

In our view, situations can be understood as contingency structures. A situation presents the individual with an assortment of possible outcomes that depend, in part, on what the person does (see Baumeister & Tice, 1985b). Entry into a situation is thus a process of placing oneself in certain contingencies. The decision to attend college, for example, represents taking on various costs (such as tuition and lost income), risks (of failure or homesickness), and obligations (such as term papers) in exchange for the chance to receive various possible rewards and benefits. A situation in this sense is quite independent of the physical surroundings, and it is possible to be in exactly the same place but in a different situation if the contingencies have shifted. For example, one might say that a football team's situation has changed since earlier in the game because of intervening changes in score or the dwindling of time left (which alter the contingencies) in the game, even if its physical location is exactly the same as it was at a previous time in the game.

The selection of contingencies for oneself is thus an important challenge for effective self-management. In some cases the choice may be simple, because one situation may offer much more attractive contingencies than others. However, many choices may require tradeoffs, such that the chances of winning greater rewards are linked to greater risks or more severe obligations. Because more difficult goals are also often the more desirable ones, the most adaptive strategy would be to select the highest goals that one can successfully reach (see, e.g., Eisenberger, Mitchell, & Masterson, 1985). Thus, to succeed, people must begin with fairly accurate appraisals of the situational contingencies and of their own capacity to live up to commitments and obligations. The self-management task does not end with the making of the commitment, of course. One must then manage one's performance so as to succeed in meeting the commitment. In a sense, making the commitment is an act that establishes the parameters of success, and performance must then be managed so as to reach that level.

Although we have spoken in terms of performance and success, it is important to note that our discussion is relevant to nonachievement domains as well. To make a commitment to marriage or parenthood, for example, is to place a variety of costly and risky obligations on oneself while also gaining the chance for various rewards. It is quite possible to fail at marriage or parenthood by not living up to one's commitments. Again, successful adaptation to life depends on a combination of making appropriate commitments and then living up to them.

The Problem of Asymmetry

Clearly, the optimal path is to select contingencies corresponding to the best one can and will do. Maximal rewards are typically obtained by selecting the highest goal one can reach —and then succeeding. It seems implausible, however, to ex-

pect that people can invariably select commitments that exactly match the best level of performance that they are actually going to achieve. Accordingly, there will be errors, in which people set goals that are higher or lower than their actual performance will turn out to be.

The consequences of these errors in prediction and commitment may often be asymmetrical: Overcommitment may often be worse than undercommitment. In other words, setting goals that are too high may be a more costly error than setting goals that are too low. If one's goal is too low, the value of success is diminished, but at least one does succeed. In contrast, failure is the likely outcome of goals that are too high (e.g., Ward & Eisler, 1987). Insofar as failure is a worse outcome than a watered-down success, then, it is preferable to choose goals slightly below one's best capability, or in common terms, to err on the side of caution.

This asymmetry may be quite common in everyday life. In formulating a career ambition, selecting a potential mate to pursue, or deciding how expensive a house to buy, the optimal is to select the most desirable one within one's reach. Normally, this will entail setting a goal at the upper limit of one's capability. Selecting too low a goal will tend to lead to some sacrifice or loss in career salary or prestige, in mate's desirability, or in dwelling size or comfort, compared with one's optimal, but one will have a correspondingly easier time succeeding at these commitments. In contrast, selecting too high a goal substantially increases the respective risks of career failure, romantic rejection, or foreclosure and repossession.

Prudence would therefore dictate incorporating some margin of error into one's decision process so that one perhaps selects a goal or contingency slightly easier than the best one could reach. Unfortunately, there is substantial evidence that self-knowledge processes would lead people toward exactly the opposite sort of error. People tend to overestimate their abilities and good qualities, their capacity to control their outcomes, and the likelihood that good things will happen to them, all of which may incline people toward selecting high goals (Taylor & Brown, 1988). Recent studies suggest that self-prediction processes suffer from pervasive overconfidence (Vallone, Griffin, Lin, & Ross, 1990). These inflated self-views may help people feel better about themselves and maintain the positive affective states associated with healthy adjustment (e.g., Taylor, 1989), but they increase the risk of making overly ambitious decisions that lead into situations where the person is likely to fail.

Thus, the first hypothesis for the present investigation was that a tendency to see oneself in highly positive, favorable terms would make people more vulnerable to this particular form of self-regulation failure. That is, when people must make decisions involving committing themselves to a particular goal or contingency structure, their positive illusions or overconfidence should create a tendency to set goals too high for themselves, with the result that their likelihood of eventual failure increases.

Self-Esteem

Protecting one's self-esteem is widely regarded as a general, fundamental goal that guides social behavior. People who have high self-esteem are presumed to be more successful at this goal

and to enjoy the benefits that presumably result from it. Consequently, high self-esteem is considered one mark of successful adjustment (e.g., Heilbrun, 1981; Kahle, Kulka, & Klingel, 1980; Whitley, 1983), consistent with the general view that high self-esteem characterizes someone who is likely to succeed in life. Research on task performance has likewise suggested that people with high levels of self-esteem are best able to make use of information about the task and setting to determine the optimal level of persistence and effort (McFarlin, 1985; Sandelands, Brockner, & Glynn, 1988). High self-esteem indicates a generous measure of positive illusions, which are good for mental health and adjustment (Taylor & Brown, 1988).

On the other hand, high self-esteem should increase vulnerability to precisely the type of self-regulation failure that we have discussed. High self-esteem, after all, is associated with high aspirations (Baumeister & Tice, 1985a). Roth, Snyder, and Pace (1986) showed that high self-esteem is associated with a tendency to make unrealistically positive claims about the self. When complex self-regulation requires people to select goals and contingencies for themselves, an exalted opinion of self should tend to cause people to overestimate what they can accomplish and therefore to select goals that may be too difficult for them. Such errors of overconfidence may then increase the chances of failure. In contrast, people with low self-esteem may tend to make errors on the side of caution, and (because of the asymmetry of implications we have noted) these should tend to lead to a diminished success rather than an outright failure.

Recent research suggests a further complication of this prediction, however. Several important studies have indicated that people with low self-esteem often have poorly developed self-schemas and are in other respects deficient in self-knowledge (Baumgardner, 1990; Campbell, 1990). To set appropriate goals for the self, one must be able to predict one's performance level, and these predictions in turn presuppose accurate self-knowledge. Simply on the basis of the extent of self-knowledge, therefore, one could predict that people with high self-esteem would perform better at self-management (and other complex self-regulation tasks). This would particularly be true if those individuals were capable of setting aside their illusions about themselves. In a provocative study, Gollwitzer and Kinney (1989) provided evidence that people can sometimes suspend positive illusions for the sake of making evaluations and judgments. The apparent implication is that people can turn illusions on and off as needed.

To reconcile these conflicting lines of argument, we reasoned as follows. The hypothesized advantage of people with high self-esteem depends on superior and extensive self-knowledge, whereas their hypothesized disadvantage depends on the intrusion of egotism into the decision process so as to inflate their predictions and distort their judgment. According to this line of reasoning, people with high self-esteem should outperform people with low self-esteem at self-management under normal, nonthreatening conditions, but an ego threat (or other esteem challenge) will tend to make self-esteem become an influential factor in the decision process. This can lead to overconfidence, overestimation, and consequent failure. Thus, high self-esteem should mainly lead to poor outcomes when an external challenge makes egotism a salient determinant of choice of commitment.

Consistent with this final hypothesis, several studies have indicated that people with high self-esteem tend to respond with extreme, irrational patterns to an ego threat, and these patterns are associated with asserting a strongly favorable view of self. (We use the term *ego threat* to refer to any event or communication having unfavorable implications about the self). As shown in a classic study by McFarlin and Blascovich (1981), people with high self-esteem tend to make more optimistic predictions regarding future performance after initial failure than after initial success. Likewise, several studies have shown that people with high self-esteem respond to failure with increased persistence (Perez, 1973; Shrauger & Rosenberg, 1970; Shrauger & Sorman, 1977), even if this persistence is counterproductive and contrary to the advice they have received (McFarlin et al., 1984). After unflattering feedback, people with high self-esteem seek to inflate their public images by rating themselves all the more favorably on further dimensions (Baumeister, 1982). When their esteem is challenged, people with high self-esteem even engage in self-defeating patterns, such as self-handicapping by reducing their preparatory effort (Tice & Baumeister, 1990), a strategy that apparently is aimed entirely at enhancing their likely credit for possible success despite its potentially self-destructive consequences (Tice, 1991).

In short, ego threat appears to cause people with high self-esteem to abruptly develop an overriding concern with maximizing their esteem, and this overriding concern appears sufficient to influence their behavioral judgment—and not always in optimal or adaptive ways. Thus, it seems likely that ego threat in particular should cause people with high self-esteem to set overly ambitious goals for themselves, which may then backfire and cause failure.

The present research thus has implications beyond the study of complex self-regulation processes, for it addresses issues of self-defeating behavior and positive illusions. The benefits of favorable views of self, optimism, and other illusions have been well established (Taylor, 1989; Taylor & Brown, 1988), whereas the potential drawbacks have received little attention in research psychology, and any evidence for them tends to be drawn from other disciplines such as history (see Baumeister, 1989) or nonlaboratory psychological research (Burger & Burns, 1988). On the other hand, research on self-defeating behavior has repeatedly indicated that errors in judgment about the self and misperceptions of contingency structures cause judgment errors leading to self-destructive outcomes (Baumeister & Scher, 1988). Any evidence that positive illusions can occasionally have self-destructive consequences would therefore be of value to the literatures on both self-defeating behavior patterns and self-knowledge biases.

Present Research

This article reports three studies exploring the relation of trait self-esteem to self-management, that is, a complex self-regulation task involving self-prediction and performance. We allowed subjects to perform a task repeatedly so that they would acquire some measure of self-knowledge about their ability level. Then they were asked to select a performance contingency for themselves. Consistent with many similar choices people face in everyday life, our subjects had an array of possible

contingencies such that higher goals offered greater rewards for success but held a greater likelihood of failure.

The setting of high goals is not necessarily self-defeating, of course. If we merely found that people with high self-esteem selected more difficult goals, this would not necessarily suggest any maladaptive pattern, because it would be plausible that they could perform up to these goals. As long as one can succeed, it may be generally true that the higher the goal, the better. To investigate the possibility of self-defeating patterns (in this case, failure at self-management), we needed a clear outcome measure, and for this we used money. Subjects faced a choice among various financial contingencies, and then they performed under these contingencies, and they were actually paid whatever they earned.

The presence of cash rewards should override many other possible considerations. Evidence has shown that as pragmatic contingencies increase, patterns of risk preference change (e.g., Weigold & Schlenker, 1991). In the absence of money, for example, the subject may have nothing to gain or lose except prestige. Under such circumstances, one could debate whether the more sensible choice is to select the difficult goal or the easy goal (e.g., failing to reach a difficult goal does not cost one much prestige). When cash rewards are present, however, people tend to orient their behavior toward them instead of various possible goals associated with esteem protection or self-assessment, as Greenberg, Pyszczynski, and Paisley (1984) have shown. In our setting, therefore, failing to reach a difficult goal would cost the subject money and carried the added disgrace of making the subject appear foolish for having chosen an inappropriate goal.

We used a performance task that emphasized skill rather than effort. Research on choking under pressure has shown that many people show decrements in skilled performance on important trials (Baumeister, 1984), and these decrements are unrelated to trait self-esteem level. Moreover, a tendency to choke under pressure carries a stigma of characterological deficiency, and so subjects should be reluctant to acknowledge that they might succumb to this pattern and perform below their ability level.

Our initial interest was in how people would select their goal level and perform. However, as the previous reasoning suggested, particular interest would accrue to how ego threat might affect the decision process (i.e., the selection of goal level). Accordingly, whereas some subjects were simply offered the choice of goal level, others were first exposed to a threatening challenge, in the form of the experimenter's suggestion that they might choke under pressure. An alternative form of ego threat, namely, prior failure feedback on an unrelated task, was used in our third experiment.

Experiment 1

Experiment 1 was set up to obtain a baseline measure of subjects' ability level and to measure how well they could set an appropriate goal and then successfully reach it. Subjects were initially given time to practice the task to reach a certain ability level. Then followed 10 performance trials. The experimenter then surreptitiously set a criterion such that 3 out of the subject's 10 performance trials surpassed this. Thus, the initial criterion

was well within the subject's reach but was in the upper echelon of his past performances.

We then allowed subjects to set their own goal for one final performance. They could either pursue the same criterion that the experimenter had indicated, for a possible $2 reward, or set a more difficult goal that would potentially bring a higher reward. Failing to reach the goal would mean, however, that the subject won nothing. This situation was thus set up to invoke the asymmetry of ordinary goal setting, in which higher goals offer larger rewards but increase the chance of failure.

Thus, the experiment asked the subject to perform the complex self-regulation (i.e., self-management) task of coordinating a goal-setting commitment with a subsequent performance. We predicted that people with high self-esteem would fail because of setting inappropriately high goals, particularly when they were confronted with an ego threat.

Method

Subjects. Participants were 35 male undergraduates ranging in age from 18 to 28. Male undergraduates were used because of availability and because it seemed desirable to avoid wide variation in extraneous factors (such as attitudes about video games or interactions with experimenter's gender) that could conceivably add substantial error variance. Subjects took part in connection with their introductory psychology course. They were classified as having either high or low self-esteem on the basis of a median split of scores on the Pliner, Chaiken, and Flett (1990) version of the Janis and Field (1959) scale. The median was 120. Subjects were run individually.

Procedure. On arrival at the laboratory, each subject listened to an overview of the procedures, signed an informed-consent form, and completed the self-esteem measure. The cover story presented the research simply as a study of how people learn and perform tasks. The subject was then introduced to the experimental task, a video game called Sky Jinks. The game was chosen because it is relatively simple for subjects to learn, because it is unfamiliar to subjects, and because (unlike many games) it contains no bonus opportunities or screen changes that might introduce nonlinearity into the distribution of scores. To play the game, the person navigates an airplane through an obstacle course (pylons, hot air balloons, and trees) as fast as possible. Each time the plane crashes into an obstacle, a small amount of time is lost. Steering involves the slight delay common to biplane steering, so one must anticipate correctly, which is especially difficult at high speed. To do well, players must make all the correct turns, avoid crashes, and use high speed as much as possible without losing control. The final score for each trial is the elapsed time, adjusted if necessary by a penalty for going on the wrong side of a pylon. All subjects were given thorough instructions about the game, and these instructions included pointing out the implications of the scoring rules for optimal performance.

The subject was then allowed 20 min to learn and practice the game. He was asked to keep a record of his scores; this ensured that all subjects did indeed spend all the time practicing. Next, the experimenter told the subject to perform a series of 10 trials. The subject was given the impression that these trials were the main focus of the experiment, and the experimenter observed the subject's performance on each trial. The experimenter also kept a record of the number of crashes and the subject's final score.

At the end of the 10 trials, the experimenter surreptitiously calculated a criterion score by rounding the subject's third best score. He then told the subject that there had actually been a criterion and that the subject had surpassed it on 3 of the 10 trials. (To justify not having told the subject about the criterion earlier, it was explained that the

subject was in a control condition to furnish data for comparison against subjects who knew in advance that they were competing against it.) The experimenter gave the impression that the criterion was standard for all research subjects.

The experimenter explained that the subject would have one last chance to surpass this same criterion, and if he succeeded he would win $2. The subject was, however, given the opportunity to set a more challenging goal for himself that would be worth more money. Any increments in whole seconds were possible, with the reward increasing by $1 per second. Thus, instead of the same criterion worth $2, the subject could try to achieve a goal that was 1 s faster, which would be worth $3, or 2 s faster, worth $4, and so forth. If the subject failed to reach the goal he set, however, he would win nothing.

Half the subjects were randomly assigned to the ego-threat condition. For these subjects, the experimenter added the following: "Now, if you are worried that you might choke under pressure or if you don't think you have what it takes to beat the target, then you might want to play it safe and just go for the two dollars. But it's up to you."

Control subjects were simply asked what goal they wanted to choose, without any ego threat or any mention of choking. After the subject committed himself to a goal, the final performance trial was enacted. Subjects then completed a postexperimental questionnaire and were debriefed. They were paid any money they had won in the experiment.

Results

The main dependent measure was the amount of money won by the subject, for it reflected how well he had managed the complex self-regulation task of setting an appropriate goal and then performing up to that level. An analysis of variance (ANOVA) on these cash outcomes revealed a significant interaction between self-esteem and ego threat, $F(1, 31) = 5.81$, $p < .05$. The main effect of self-esteem was also significant, $F(1, 31) = 4.86$, $p < .05$, reflecting superior performance by people with low self-esteem. The main effect of ego threat was not significant. Table 1 contains the means. Under ego threat, people with high self-esteem won significantly less money than people with low self-esteem, $t(31) = 3.32$, $p < .01$, whereas in the control condition there was a nonsignificant trend in the opposite direction. The poor self-management of people with high self-esteem under ego threat thus appears to be mainly responsible for the main effect for self-esteem.

The subject's overriding purpose in the experiment was, arguably, to reach his goal, whatever it might be. A dichotomous measure might therefore be more appropriate than a continuous measure. We coded simply whether each subject reached his goal. In the control condition, the difference between the number of people with high self-esteem who failed (60%) was not significantly different from the number of people with low self-esteem who failed (40%), $\chi^2(1, N = 17) < 1$, ns. In the ego-threat condition, however, a substantial difference emerged. Most (87.5%) of the high-self-esteem subjects failed in that condition, whereas only a minority (12.5%) of the subjects with low self-esteem failed to win anything, and this difference was significant, $\chi^2(1, N = 18) = 10.81$, $p < .001$.

Supplementary analyses could be used to explore the question of whether the poor outcomes of subjects with high self-esteem in the ego-threat condition were due to setting high goals or to performing poorly. These must be regarded with caution, because to look at the goal setting or the performance alone is to take it out of its essential context. Under ego threat, subjects with high self-esteem did set higher goals for themselves ($M = \$3.44$) than subjects low in self-esteem ($M = \$3.12$), but the difference was not significant.

To examine performance under pressure, we computed the difference between each subject's performance score and the average of his 10 previous performance trials. A significant interaction between ego threat and self-esteem emerged on an ANOVA, $F(1, 31) = 7.16$, $p < .05$. In the control condition, there was no difference between the performance of people with high and low self-esteem ($t < 1$, ns). This is consistent with past findings that self-esteem does not predict choking under pressure. However, in the ego-threat condition, people with high self-esteem showed a significant drop in performance and indeed averaged 1.23 s slower than their previous average. In contrast, people with low self-esteem performed 3 s faster under pressure than in their previous performances. The difference between the choking of high versus low self-esteem individuals in the ego-threat condition was significant, $t(31) = 3.33$, $p < .01$.

We also counted the number of times each subject crashed during each trial. These were likewise compared with how subjects had performed during the 10 performance trials. We reasoned that a subject's habitual frequency of crashes reflected his characteristic strategy with regard to the speed–accuracy trade-off, and so changes in the frequency of crashes on the final, pressured trial might reflect shifts in this tradeoff. We computed change scores for each subject by subtracting the number of crashes in the money trial from the average number of crashes during the 10 preceding performance trials. An ANOVA revealed a significant interaction between ego threat and self-esteem, $F(1, 31) = 6.95$, $p < .02$. Subjects with high self-esteem showed a significant increase in crashes following the ego threat, unlike subjects with low self-esteem, whereas in the control condition self-esteem level made no difference, $t(31) = 3.57$, $p < .01$.[1] (In fact, subjects with low self-esteem actually had fewer crashes after the ego threat than before it, suggesting a shift toward a more cautious and conservative strategy, unlike subjects with high self-esteem who appear to have responded to the ego threat with a more risky, aggressive style of play.)

Our hypotheses referred to performance processes, not learning processes, and so it is of some interest to ask whether sub-

Table 1
Final Cash Outcomes for Subjects in Experiment 1

Condition	High self-esteem	Low self-esteem
Ego threat	0.25	2.80
Control	1.40	1.29

Note. Numbers are average winnings, in dollars, from Experiment 1.

[1] One could also analyze the crash data as an after-only measure, disregarding individual variations in crashing frequency during the initial 10 performance trials. Using this approach, the interaction between self-esteem and ego threat dropped out of the significant range, $F(1, 31) = 2.36$, $p = .13$. The poor performance of subjects with high self-esteem under ego threat was still apparent, however, for they ($M = 4.6$) crashed significantly more often than subjects with low self-esteem in the same ego-threat condition ($M = 1.7$), $t(31) = 2.77$, $p < .01$.

jects were still learning during the performance phase of the study. A final analysis examined changes in performance level during the 10 performance trials before the pressured trial. A repeated measures ANOVA revealed no differences as a function of trial, $F(9, 306) = 1.17$, ns, indicating that subjects had indeed reached a performance plateau and were not continuing to learn and improve (at least not significantly) during those trials.

Discussion

The results of Experiment 1 provided partial support for our hypotheses. We gave subjects an opportunity to select a performance goal for themselves, with the stipulation that higher goals offered greater possible rewards, but also greater risk of failure. Subjects performed this task with moderate success in the absence of ego threat, and self-esteem made no difference. The simplest version of our hypothesis, that high self-esteem should be associated with pervasive overconfidence and therefore with self-regulation failure across the board, was clearly disconfirmed. But when ego threat was generated by insinuating that the subject ought to set low goals if he lacked what it took to perform effectively under pressure, people with high self-esteem became ineffective. Those individuals failed to meet the goals they set for themselves at a much higher rate of failure than was exhibited by other subjects. Thus, the results fit the more complex version of our hypothesis, suggesting that self-regulation failure should occur among people with high self-esteem who are exposed to an ego threat.

The control condition corresponded to a familiar procedure for testing performance under pressure: Subjects were simply asked to perform again on a skill task, with the addition of an incentive. Consistent with many past studies, published and unpublished, self-esteem failed to have an impact.[2] The present study confirms this apparent irrelevance of self-esteem to performance under pressure and extends it to show that even self-set goals do not apparently yield choking effects that are reliably predicted by self-esteem.

However, self-set goals in combination with ego threat do apparently create a performance context that is especially disadvantageous to people with high self-esteem. Subjects with high self-esteem did fail significantly under ego threat. Their increased rate of crashes provides one clue to their response style. The skill task set by this study involved a speed–accuracy tradeoff, such that one could play cautiously and avoid crashes or could adopt the more risky style of playing faster. When trying for a superior performance, many people tend to increase speed and hope that accuracy holds up, although the typical result is a decrease in accuracy (Heckhausen & Strang, 1988). In our study, this appears to be what people with high self-esteem did. It is consistent with past evidence that people with high self-esteem respond to ego threat by trying for a superior performance (e.g., McFarlin & Blascovich, 1981; Shrauger & Sorman, 1977). The greater speed and consequently reduced accuracy may have led to the increase in crashes and hence the poorer score.

We had hypothesized that ego threat would induce subjects with high self-esteem to set especially high goals. There was no direct evidence that this happened. The goals set by ego-threat-

ened people with high self-esteem were not significantly higher than the goals set by subjects in other conditions, although there was a nonsignificant trend in that direction. One possible explanation for the failure of a significant finding to emerge on this variable was that our reasoning was wrong in this respect. Alternatively, our results may have suffered from a ceiling effect. There may not have been much plausible room for subjects to set higher goals for themselves. The baseline goal was already moderately challenging, for it required the subject to reach a criterion that he had only reached on 3 of the previous 10 trials. Our analyses suggested that subjects were indeed reaching a performance plateau by the time they were setting goals for themselves, and this is perhaps to be expected after 20 min of practice and 10 additional performance trials. As a result, all subjects may have had a fairly accurate idea of how well they could perform. To go more than 1 or 2 s faster may have overstepped the limits of plausibility, and this limited range may have prevented self-esteem effects on goal setting to emerge. One goal of Experiment 2 was to rectify this problem.

Experiment 2

The main innovation in Experiment 2 was to eliminate the possible ceiling effect in Experiment 1 by allowing subjects a broader range of choices, including a greatly enhanced opportunity to play it safe and a more plausible option to shoot for a higher goal. A second purpose was to alter the procedure so that the subject had something to lose, for one could argue in Experiment 1 that the subject had yet not received any money, had nothing to lose, and so might as well adopt various idiosyncratic or even unrealistic strategies about the possibility of winning it.

To avoid the ceiling effect, we changed the main dependent measure. Instead of setting a level of performance as a goal, these subjects were asked to decide how much they would bet on themselves to surpass a fixed criterion on their next performance. That way, we could retain the criterion at the highest third of the subject's previous performance scores. We told the subjects in the crucial conditions that they had already won a certain amount of money and that they could either keep it or bet it on their own next performance. By making a minimal bet, the subject could assure himself of leaving the experiment in possession of the moderately attractive amount he had already collected. At the opposite extreme, a large bet offered the chance to collect a large payoff but also risked the loss of all he had earned so far.

Subjects were given money and allowed to bet any portion of it on their final performance. The experimenter offered to triple any amount that the subject bet if the subject surpassed the criterion. The bet was thus roughly neutral in terms of the

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[2] The published studies, such as Baumeister's (1984), generally deleted the discussion of self-esteem from the reports because of its failure to yield significant findings. Unpublished studies remained unpublished largely because of the failure to yield significant findings. Thus, the published literature on performance under pressure does not contain much explicit discussion of the failure of self-esteem to predict the effect, but there have been multiple failures.

statistically expected value: The subject needed to perform in the top third of his past performances to triple his money.

Because any rigorous analysis of outcome probabilities would not lead to a strong conclusion about whether to make a large or small bet, the main determinant of the subject's betting would presumably be his confidence in his ability to perform up to his capacity when it was particularly important to do so. For subjects in the ego-threat condition, this was underscored by suggesting that people who typically fail to perform optimally in highly important circumstances—that is, people who tend to choke under pressure—should make small bets.

Method

Subjects and design. Subjects were 39 male undergraduates. They received course credit for participation. They were classified as high or low in self-esteem using the same scale and method as in Experiment 1, except that the median was slightly higher (123). The design of the experiment was the same as that of Experiment 1, with two independent variables (i.e., trait self-esteem and ego threat).

Procedure. The procedure began the same as in Experiment 1 with a cursory cover story about research on how people learn and perform at computer simulation tasks, followed by having subjects fill out informed-consent forms and the self-esteem measure, explaining the task to them, allowing them 20 min to practice the task, having them then do 10 performance trials with the experimenter watching and recording (except that we recorded only scores, not crashes), and then telling them that there had been a preset criterion that they had surpassed on 3 of those 10 trials.

Subjects were told that they had already earned $3 in the experiment by virtue of their surpassing the criterion on 3 of the 10 performance trials. They were told that there would be one more performance trial with the same criterion of success. Moreover, they were allowed to bet any part of their $3 winnings, ranging from 25¢ to the full $3 in increments of 25¢. If they succeeded in surpassing the criterion on the final trial they would receive triple whatever they had bet, and if they failed to reach the criterion they would lose whatever they had bet. Whatever they did not bet was theirs to keep regardless of success or failure. The experimenter elaborated this explanation by illustrating the outcomes that accompanied minimum (take home either $2.75 or $3.50) and maximum (take home either $9 or nothing) bets.[3]

The minimal bet thus offered an expected value of $2.975 if one assumes that the subject's likelihood of success was 30%, on the basis of his performance on the preceding 10 trials. The maximum bet offered an expected value of $2.70. By this reasoning, there was a trivial statistical advantage to making a small bet. If one allows for the possibility of further improvement taking place over the performance trials, then even this small advantage would be diminished. From the subject's point of view, his chances of succeeding might be better than 30% if he felt he could control his performance level by extra vigilance or effort or if he had made some avoidable mistake or been careless on any of the preceding 10 trials. If so, then statistical rationality could well conclude that there was no optimal bet size. (In any case, the statistical argument was the same in all conditions.)

For the subjects in the ego-threat condition, the experimenter further elaborated his explanation of the betting possibilities by advising them that if they felt they could do well, then they ought to bet a large amount, "but if you're the sort of person who tends to choke under pressure or might not have what it takes to do well, then you might want to play it safe and not bet very much money."

Following this, the subject indicated how much he wanted to bet. He then performed the task, completed a final questionnaire, received a full debriefing, was paid any money he had earned, and was thanked and dismissed.

Results

The main dependent measure was the amount of money the subject had at the end of the experiment. Replicating the findings of Experiment 1, we found a significant interaction between ego threat and self-esteem, $F(1, 35) = 4.82, p < .04$. These results are included in Table 2. The pattern of means was similar to what we found in Experiment 1, although there was one small difference. In Experiment 1, the outlier among the means was the very poor outcome of the high-self-esteem subjects under ego threat; in Experiment 2, the outlier was the high success of the high-self-esteem subjects in the absence of ego threat. Those subjects did substantially better than low-self-esteem subjects in the same control condition, $t(35) = 2.38, p < .05$. Under ego threat, this was reversed (just as in Experiment 1), but the relative superiority of low-self-esteem subjects failed to reach significance ($t < 1, ns$). In any case, subjects with high self-esteem earned less money under ego threat than in the absence of ego threat, and this comparison was significant, $t(35) = 2.18, p < .05$.

The cash outcome data were also examined in relation to the full range of self-esteem scores. Self-esteem was strongly and positively correlated with cash outcome in the absence of ego threat, $r(18) = .65, p < .01$. Following ego threat, however, there was a sizable but nonsignificant trend in the opposite direction, $r(19) = -.29, ns$. These analyses confirm the implications of the ANOVA over the full range of self-esteem scores.

Of particular interest was the rate of total self-regulation failure, as indicated by the subject's loss of all his money (by betting the maximum and then performing below the criterion). Across the entire study, there was no difference between high and low self-esteem in the tendency to lose everything, $\chi^2(1, N = 39) < 1, ns$. In the ego-threat condition alone, however, nearly half the people with high self-esteem lost everything, and that failure rate was marginally significantly greater than the failure rate of people with low self-esteem, $\chi^2(1, N = 20) = 3.30, p < .07$.

The goal-setting data constituted the area where Experiment 2 was supposed to clarify some ambiguous findings of Experiment 1. Because of the special interest in the betting data, we computed correlations between self-esteem scores (using the full range of scores) and bets. Under ego threat, high-self-esteem scores were associated with high bets, $r(19) = .44, p = .05$. In the absence of ego threat, there was no relationship, $r(18) = .13, ns$. We also conducted an ANOVA using the median split on self-esteem. These data are summarized in Table 3. The ANOVA revealed a marginally significant interaction between ego threat and self-esteem level, $F(1, 35) = 3.68, p < .07$. Under ego threat, subjects with high self-esteem bet more than subjects

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[3] Some readers indicated confusion about these computations. Subjects were permitted to keep whatever they did not bet, and whatever they bet was either lost or tripled. Thus, the minimal 25¢ bet left the subject with $2.75 guaranteed, plus either nothing from the bet or 75¢ (i.e., 25¢ tripled) if he succeeded in his performance.

with low self-esteem, $t(35) = 2.12$, $p < .05$. In the no-threat control condition, there was no difference ($t < 1$, ns).

Performance under pressure was assessed by examining how the subject's performance on the final, pressured trial compared with his average performance on the preceding 10 trials. Consistent with Experiment 1, an ANOVA on these change scores revealed a significant interaction between self-esteem level and ego threat, $F(1, 35) = 5.65$, $p < .05$. Once again, the deterioration in performance of people with high self-esteem under ego threat appeared responsible for the interaction.

Discussion

Experiment 2 replicated the general pattern of findings of Experiment 1 and shed some additional light. Once again, ego threat appeared to interfere with the self-regulation processes of people with high self-esteem. Those individuals showed the greatest tendency to make high bets on themselves and then to lose.

One minor discrepancy between the two experiments was that while the interaction in Experiment 1 apparently owed its significance to the poor performance of people with high self-esteem under ego threat, the interaction in Experiment 2 owed its significance to the good performance of people with high self-esteem in the absence of threat. This discrepancy should probably be explained on the basis of the procedural differences in the two studies. Experiment 2 offered a better opportunity for playing it safe by making a low bet. If the subject did indeed anticipate a poor performance, he could not really do much in Experiment 1 to ensure some winnings, but in Experiment 2 there were some extremely conservative options available.

We may therefore conclude that in the absence of ego threat, people with high self-esteem can be quite effective at managing their performance commitments. When there was a full range of options available, they showed a very effective capacity to bet high when they were going to do well and to bet low when they were going to perform badly. In other words, they seemed to know whether they would be able to reach the criterion and could therefore bet accordingly. This exceptional skill at self-management vanished, however, under conditions of ego threat. When the experimenter framed the betting instructions as a test of character, people with high self-esteem fared rather poorly, and their failure seems to have been due to a marginally significant tendency to make unrealistically high bets. Indeed, when the experimenter suggested that people who were prone to choke under pressure should make minimal bets, many subjects with high self-esteem immediately responded by saying

Table 2
Final Case Outcomes for Subjects in Experiment 2

Condition	High self-esteem	Low self-esteem
Ego threat	2.67	3.66
Control	5.60	2.21

Note. Numbers represent mean average winnings, in dollars, from Experiment 2.

Table 3
Amount of Money Subjects Bet in Experiment 2

Condition	High self-esteem	Low self-esteem
Ego threat	2.33	1.39
Control	1.77	2.07

Note. Numbers are average amount of money bet by subjects on the final performance, in dollars, in Experiment 2. Range was 25¢ to $3.00.

they would bet the maximum. As a result, people with high self-esteem showed an elevated rate of self-regulation failure in the ego-threat condition. Many of them bet everything and lost it.

Experiment 3

Despite the positive findings of the first two studies, some areas of ambiguity remained, making it desirable to conduct a third study to resolve these issues and increase the generality of the findings.[4] Although Experiment 3's procedures and hypotheses were generally similar to those of the earlier studies, several important changes were made as follows:

First, and most important, a different ego-threat manipulation was used. In the first two studies, the ego threat was administered by suggesting that the subject might want to make a low bet if he were the sort of person who did not perform well under pressure. This manipulation may have made some subjects sensitive to the possibility of choking under pressure, which in turn might have impaired their performance (such as by a priming or self-fulfilling prophecy effect). For this reason, the third study manipulated ego threat by administering bogus failure feedback on a creativity test that was supposedly separate from the main task. No mention was made of choking under pressure.

A related concern about the ego-threat manipulation used in Experiments 1 and 2 was that it could have made it impossible for subjects to make a cautious bet without identifying themselves as people who performed poorly under pressure. In effect, the experimenter was saying "If you are a choker, then make a low bet," which may have raised significant self-presentational concerns about the bet itself. In our view, this interpretation would still be broadly consistent with our reasoning, because it would be a short-sighted and self-defeating response to make an unrealistic commitment in such circumstances. After all, the most humiliating outcome would be to express high confidence by making a large bet—and then to lose it all by performing badly. Such an outcome would seemingly depict the individual as a conceited but incompetent fool. Still, it is plausible that at that moment subjects were so preoccupied with the self-presentational challenge that they failed to reflect on the greater self-presentational danger of overcommitting

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and then failing. In any case, Experiment 3's use of bogus failure feedback on an unrelated task would remove this aspect of a direct verbal challenge to make a high bet.

Because of the possibility that excessive bets may have been a response to some immediate self-presentational demand, a second refinement was made in the procedure for Experiment 3. Some subjects were asked to communicate their bets directly (and immediately) to the experimenter, but others made private bets that were to be kept secret until the end of the experiment. Subjects in the private condition were therefore freed from any pressure to use their bets as a self-presentational response to the immediate situation or the experimenter's communication of the ego threat. Indeed, the delay should have focused their attention on the fundamental point that maximal self-presentational damage would be sustained by losing a large bet (which would imply both incompetent performance and a foolishly conceited inability to know their own capabilities). By comparing responses in the public versus private conditions, it would be possible to assess the degree to which the findings of the first two studies were due to short-term self-presentational pressures.

A third refinement was the inclusion of both male and female subjects. Clearly, this held the potential to increase the generality of the findings. The form of the ego threat used in Experiment 3 (failure on a creativity test) would presumably apply to both sexes.

Another change involved asking subjects how they felt at the end of the procedure (i.e., after their performance). It might be suggested that subjects high in self-esteem may not have been distressed to bet all their money and lose it, because of the elasticity and resilience of positive illusions (e.g., Taylor, 1989) and because they might feel better for having tried to achieve something great as opposed to having merely played it safe in a cautious and perhaps cowardly fashion. According to this analysis, subjects' final affective states should depend on their bets rather than on the outcome, whereas our analysis predicted that the success or failure outcome would be the main determinant.

In addition, the small inconsistency between the results of the first two studies made it desirable to have additional data. It was hoped that the addition of Experiment 3 would make the entire set of findings clearer and more internally consistent.

Method

Subjects and measures. Participants were 27 male and 33 female undergraduates. They were promised extra credit in their introductory psychology course plus an opportunity to earn some money. (The amount was deliberately left unspecified, but they were told that the average was about $3.) Six additional participants were not included in the analyses because of failure to complete the measures, and 4 additional (foreign) subjects who showed up for the experiment were not run because their command of English seemed sufficiently weak as to undermine their potential for understanding the procedures and measures.

Subjects were randomly assigned to performance feedback conditions. Male and female subjects were distributed approximately equally among the design cells. Self-esteem was measured using Fleming and Courtney's (1984) version of the Janis and Field (1959) scale, excluding the physical appearance and physical fitness dimensions (because these were deemed irrelevant to the cover story and hypothe-

ses). Participants were classified as having either high or low self-esteem on the basis of a median split of the total score combining the three subscales. Scores ranged from 11 to 143, and the median was 91.

Design and cover story. The experiment used a factorial design with two levels of self-esteem (high and low) and three conditions (success, failure/public bet, and failure/private bet). Participants were told that the purpose of the experiment was to provide updated norms for a well-validated measure of nonverbal intelligence that was highly predictive of posteducational, occupational, and general life success. They were led to believe that the Sky Jinks video game (the same game used in Experiments 1 and 2) was one component of the updated version of the test. They were told that they would be taking one component of the older version of the test, having to do with creativity, as well as one component of the new, updated version of the test (the video game). They were told that they would receive feedback about their performance on the tests. The different tasks were presented as measuring different aspects of nonverbal intelligence.

Procedure. Participants were run individually. On arriving at the laboratory, the cover story, described earlier, was explained to participants. After signing a consent form and completing the self-esteem measure, participants were given the bogus creativity test. They were asked to list as many alternative uses for a doughnut as they could in 3 min. They were told that their answers were scored on a combination of quality and quantity, and they were shown examples of responses to other questions from the scoring manual. Pretesting suggested that subjects tended to run out of ideas around 3 min. To increase the subjective impact and plausibility of the subsequent feedback, subjects in the success condition were actually given less than 3 min, which entailed that they were still writing more ideas when time was called; in contrast, for subjects in the failure condition, the experimenter waited until they had been sitting there, unable to come up with any more responses, for an awkward interval. Pretesting established that these small alterations in time allocation gave subjects the impression that they had more ideas than the typical test taker (in the success condition) or were embarrassingly devoid of creative ideas (in the failure condition). In practice, success subjects received between 2 and 2.5 min, whereas failure subjects had approximately 4 min.

After completing the creativity test, participants were introduced to the video game. The experimenter explained how to play the game and said that each participant would have 20 min to practice the game before being tested at it, because prior research had shown that the learning curve could reach a stable level in that amount of time. Participants were asked to record their practice scores (as in Experiments 1 and 2). The experimenter said she would score the creativity test and left the room while the participant practiced.

After 20 min, the experimenter returned and recorded the scores and crashes as the participant completed 10 performance trials. The experimenter then gave participants the feedback from the creativity test. Participants in the success conditions were told that they had received one of the highest scores the experimenter had seen at this university, and she intimated that the subject seemed to have a bright future in creative endeavors. Participants in the failure conditions were told that they had received one of the lowest scores the experimenter had seen at this university and that they seemed to have a deficiency in creative realms.

After giving the creativity feedback, the experimenter said she could also tell them a little about how they did on the video game portion of the test. As in Experiment 2, participants were told that they had surpassed a preset criterion on 3 out of the 10 trials. At this point, the experimenter said that there would be one more trial and that it would involve money. She said that she would now pay the subject the $3 that he or she had earned for participating in the study, but the subject would be required to bet at least 25¢ on the final trial. She explained that this final trial was included at the request of the test manufac-

turers, who were interested in how motivation might affect performance on their test. She said that the same, preset criterion would be used that had been used in the preceding trials and that the subject had surpassed on 3 of the 10 trials. The subject could bet anywhere from 25¢ to the full $3, in increments of 25¢, and that the bet would be triple or nothing. She illustrated the contingencies by explaining the possible outcomes with the maximum and minimum bets, exactly as in Experiment 2.

The criterion was actually set individually for each participant, by choosing a round number approximately half way between the subject's third and fourth best scores on the 10 performance trials. Participants in the success conditions and participants in the failure/public betting conditions were asked how many of their quarters (from 1 to 12) they wished to bet, and the experimenter wrote down the response. Participants in the failure/private betting conditions were asked to write their bet on a slip of paper and not let the experimenter see it until after the final performance trial. After the bets were made, participants played the game a final time, were paid what they had earned, and filled out a postexperimental questionnaire asking whether they wished they had bet differently and how they felt. Participants were thoroughly debriefed before leaving.

Results and Discussion

Sex of subject had no significant effect on any of the main measures. There was a consistent tendency for male subjects to outperform female subjects on the video games, $F(1, 48) = 6.98$, $p = .011$ (on the money trial), but this did not interact with other variables or bias the major analyses. Accordingly, data were collapsed across gender. In addition, no differences were found between the two failure conditions, and although these are included separately in the ANOVAs, they have been combined for the purposes of cell comparisons in follow-up analyses.

Self-management. The main dependent measure of effective self-management was how much money the subject earned by the end of the experiment. These results are presented in Table 4. An ANOVA revealed a significant interaction between self-esteem level and condition, $F(2, 54) = 6.92$, $p = .002$, as well as a significant main effect for condition, $F(2, 54) = 3.81$, $p < .05$. As can be seen from Table 4, the public and private betting versions of the failure condition produced nearly identical results, but the success conditions looked quite different. Subjects high in self-esteem earned much less in the two failure conditions than in the success condition, $t(54) = 4.29$, $p < .001$. Subjects low in self-esteem showed a nonsignificant trend in the opposite direction.

Alternatively, pairwise comparisons could be computed within condition, comparing high versus low self-esteem. In

Table 4
Final Cash Outcomes for Subjects in Experiment 3

Condition	High self-esteem	Low self-esteem
Failure/public	1.60	3.40
Failure/private	0.93	3.05
Success	5.38	2.55

Note. Numbers are average winnings, in dollars, from Experiment 3. $n = 8, 10,$ or 11 per cell.

the two failure conditions, subjects with high self-esteem earned significantly less than subjects with low self-esteem, $t(54) = 2.74$, $p < .01$. After success, however, subjects with high self-esteem managed themselves better than subjects with low self-esteem, as reflected in greater financial winnings, $t(54) = 2.64$, $p < .05$.

The results of our median split ANOVA were confirmed by a multiple regression analysis that incorporated self-esteem as a continuous variable. This analysis yielded a significant interaction between self-esteem and condition,[5] $F(1, 56) = 11.61$, $p < .01$.

Several implications of these results deserve mention. First, they replicate the broad pattern of results from Experiments 1 and 2, indicating that the results of those studies were not dependent on the precise form of the ego-threat manipulation. Second, they suggest that short-term self-presentational concerns or pressures did not account for the betting patterns in those studies, because the subjects with high self-esteem who made their bets privately fared no better than those who made their bets publicly.

Third, they support two conclusions about the self-regulatory capacities of people with high self-esteem, each of which was supported by one (but not both) of the previous studies. Under auspicious circumstances (in this case, a preliminary but unrelated success experience), people with high self-esteem performed better than other people at self-management. Following an ego threat, however, people with high self-esteem performed worse than other people. High self-esteem does apparently have both positive and negative implications for effective self-regulation.

Betting and performance. As in the previous studies, we sought additional information by decomposing the self-management task into its constituent parts, in this case betting and performing. We reiterate, however, that such findings should be regarded cautiously, because the successful self-management was defined by the coordination of these processes.

An ANOVA on the amounts subjects bet revealed a significant main effect for self-esteem, $F(1, 54) = 15.98$, $p < .001$, indicating higher bets by people with high self-esteem. There was also a trend toward a significant interaction, $F(2, 54) = 2.39$, $p = .101$, indicating that the bet differential between high and low self-esteem was small in the success condition but larger in the two failure conditions. The mean bets are depicted in Table 5. Pairwise comparisons confirmed that people with high self-esteem bet more in the two failure conditions than in the success condition, $t(54) = 2.30$, $p < .05$, whereas people with low self-esteem showed a nonsignificant trend in the opposite direction ($t < 1$, *ns*). These comparisons support the hypothesis that people with high self-esteem respond to failure by making exceptionally large and optimistic commitments for future performances.

There were no significant effects on goal criterion, score on the money trial, or change in score from the 10 performance trials to the money trial. This lack of differences would seem-

[5] For the regression analysis, we collapsed the two failure conditions into one and treated them as a single condition, thereby avoiding the problems and ambiguities associated with dummy codings.

Table 5
Bets and Crashes for Subjects as a Function of Condition

Condition	Amount bet		Change in crashes	
	HSE	LSE	HSE	LSE
Failure/public	8.60	4.40	1.94	0.42
Failure/private	10.46	4.90	1.87	-0.01
Success	6.25	5.36	-0.44	0.36

Note. Bets refer to mean amount, in dollars, bet by subjects in that condition on their final trial. Crash data reflect mean change in number of crashes from the baseline (determined by the average of the 10 previous performance trials) during the final trial. Positive numbers indicate an increase in crashes and, thus, a deterioration in accuracy of performance. $n = 8, 10,$ or 11 per cell. HSE = high-self-esteem; LSE = low self-esteem.

ingly rule out any suggestion that unequal performance capabilities contributed to the results. On the crucial performance measure of whether the subject managed to reach his or her performance criterion successfully on the money trial, however, an ANOVA revealed a significant interaction between self-esteem and condition, $F(2, 54) = 4.75, p < .05$. People with low self-esteem succeeded at roughly the same rate in all conditions, but people with high self-esteem showed substantial differences. Most of them surpassed their criterion after receiving success feedback, but the majority of them failed to reach it after receiving the ego threat.

The tallies of crashes supported our earlier findings pertaining to the hypothesized speed–accuracy tradeoffs. As in Experiment 1, we computed a crash change score by subtracting the subject's average number of crashes on the 10 performance trials from the number of crashes on the money trial. The results are portrayed in Table 5. An ANOVA on these scores revealed a significant interaction between self-esteem level and condition, $F(2, 54) = 4.974, p = .01$, as well as main effects for self-esteem, $F(1, 54) = 5.446, p < .05$, and for condition, $F(2, 54) = 3.852, p < .05$. Subjects high in self-esteem showed a significant increase in crashes in the two failure conditions as compared with the success condition, $t(54) = 3.94, p < .001$, whereas subjects low in self-esteem showed a nonsignificant trend in the opposite direction $(t < 1, ns)$.

The increased rate of crashes among subjects high in self-esteem following an ego threat provides further confirmation of the suggestion that they sacrifice accuracy in favor of speed under those conditions. These results are consistent with the findings of Experiment 1. There was, however, no confirmation of Experiment 1's apparent finding that subjects low in self-esteem shift toward a more cautious approach after an ego threat. The significant interaction thus appears to be due wholly to the attempt by people with high self-esteem to adopt a more risky and ambitious approach to performance, presumably, based on their confidence and their determination to excel.

Thoughts and feelings. The postexperimental questionnaire asked subjects to furnish ratings of their emotional states. The most important issue they addressed was whether subjects with high self-esteem actually felt bad after making high bets and losing all of their money or, alternatively, felt good for hav-

ing tried to accomplish a difficult goal rather than adopting a safe, cautious approach.

The results suggest that betting a large amount and losing it was in fact quite distressing to subjects with high self-esteem, consistent with our reasoning and hypotheses. Among subjects who scored high in self-esteem, we computed correlations between several key variables and subjects' self-reported happiness after the procedure was completed. The simple categorical variable of whether they reached their criterion (and thus won their bet) was very strongly predictive of happiness $(r = .847)$. Likewise, the amount of money they won was a strong predictor of happiness $(r = .841)$. In contrast, the hypothesis that these individuals would feel good simply because they bet a large amount of money was not supported; indeed, the correlation between the size of the bet and subsequent happiness was in the opposite direction $(r = -.557)$, indicating that high bets led to lower happiness.

It appears, too, that subjects with high self-esteem regretted their large bets when they lost them, contrary to the hypothesis that they would be glad to have bet ambitiously regardless of the outcome. Subjects with high self-esteem who failed to reach their criterion indicated on the postexperimental questionnaire that they wished they had bet only 1 or 2 quarters $(M = 1.82,$ or $0.46)$ out of the possible 12. Those who won wished they had bet an average of 9.67 quarters ($2.41). This difference was highly significant, $t(51) = 6.23, p < .001$. (Similar effects were found for subjects with low self-esteem.) Indeed, there was evidence that subjects with high self-esteem felt angry after losing their bets. A 2×2 ANOVA with self-esteem level and whether the subject reached the criterion for winning the bet revealed a main effect on anger for losing the bet, $F(1, 51) = 8.76, p < .01$, and a marginally significant interaction, $F(1, 51) = 2.89, p < .10$, with the highest levels of anger reported by subjects scoring high in self-esteem but losing their bet. Similar effects were found on self-ratings of other forms of distress, including embarrassment, disappointment, and frustration. Thus, it appears that failing to reach the performance criterion and hence losing money was a very aversive outcome for all subjects, including those with high self-esteem.

General Discussion

The results of these three studies indicate that trait levels of self-esteem are important predictors of success at a complex self-regulation task. In all three studies, ego threat interacted with level of self-esteem to determine the effectiveness of self-management. The person's outcome depended on a combination of committing oneself to appropriately difficult goals and then performing up to the level to which one had committed oneself. The interactions in all three studies reflected a deterioration in the self-regulatory effectiveness of people with high self-esteem under ego threat.

In the absence of ego threat, people with high self-esteem were quite effective at self-management, as indicated by the amount of money they managed to have at the end of the experiment. Indeed, in Experiment 2, where they had a full range of options for setting themselves either very modest or very ambitious goals, they performed exceptionally well in comparison with other subjects in all other conditions. Likewise, in Experi-

ment 3, subjects with high self-esteem showed exceptional effectiveness at self-management in the aftermath of an initial, but unrelated, success experience.

These results suggest that as long as people refrain from allowing egotism to influence their decisions, people with high self-esteem have an impressive capacity to invest themselves in appropriate goals. This presumably reflects an effective capacity to make reasonably accurate predictions about how well one will perform, thus effectively integrating self-knowledge with an accurate appraisal of task demands. Recent research has suggested that people with high self-esteem far exceed those with low self-esteem in self-knowledge (Baumgardner, 1990; Campbell, 1990) and in ability to discern the contingencies and demands of a particular task performance (McFarlin, 1985; Sandelands et al., 1988). One might suspect that their self-predictions would still be prone to dangerous errors because of a tendency toward self-enhancing illusions, but it may well be that people can temporarily set aside such illusions and judge things accurately when making important decisions and commitments (Gollwitzer & Kinney, 1989).

In any case, it was clear that people with high self-esteem managed themselves very effectively as long as they were not led to make their decisions and commitments on the basis of face-saving or esteem concerns. This is consistent with other evidence that high self-esteem is associated with generally superior capabilities for self-regulation (Bandura, 1989; Taylor, 1989). The implication that people with high self-esteem have a superior capacity for self-management tasks may well shed light on why their self-esteem is high in the first place. By selecting appropriate goals and performance settings, one can improve one's chances for success in life. If two people have equal levels of ability, one of them may achieve more successes by choosing goals and performance settings more prudently. High self-esteem may therefore be associated with superior adaptation to life (e.g., Heilbrun, 1981; Kahle et al., 1980; Whitley, 1983).

This self-regulatory effectiveness of people with high self-esteem vanished, however, when ego threat was introduced. When their characterological worth was challenged, either by a verbal challenge from the experimenter or by receiving failure feedback on an important, unrelated task, these individuals responded in a very self-enhancing fashion and hence tended to commit themselves to goals that they were unable to reach. This result is consistent with other evidence that people with high self-esteem respond in extreme, self-enhancing, and sometimes irrational ways when events impugn their self-worth (e.g., Baumeister, 1982; Blaine & Crocker, in press; McFarlin & Blascovich, 1981; Roth et al., 1986). It is also consistent with previous evidence that attending to positive indications can lead to self-regulation failure (Tomarken & Kirschenbaum, 1982).

It is tempting to try to analyze the self-regulation task into component parts to see just where people went wrong. To do well in the experimental situation, subjects had to predict and commit effectively and then perform up to the level they had chosen. A pessimistic prediction and overly cautious commitment would diminish the value of success. Failure, however, involved falling short of the goals to which one had committed oneself. Self-regulatory failure could result either from overly optimistic prediction or from unusually poor performance. One must be cautious about trying to separate those two pro-

cesses, because it is really the coordination that is decisive—that is, an overly optimistic prediction is in a sense defined by the criterion that the subsequent performance fell short of it.

Still, one may make some effort to distinguish between self-prediction and task performance as the locus of failure. Our results contained some evidence that each of these components contributed to the overall failure. In Experiments 1 and 3, there was some suggestion that people with high self-esteem showed a tendency to choke under pressure in the ego-threat condition. The data on crashes suggested that these people tried to perform more aggressively than usual, presumably out of a desire to achieve an impressive success, but the increase in speed brought a loss of accuracy, and the result was counterproductive. When trying for a maximal or record performance, people sometimes tend to favor speed over accuracy, which can be counterproductive (see Heckhausen & Strang, 1988). The impaired performance of people with high self-esteem in Experiments 1 and 3 may have reflected just such a tradeoff, and this in itself can be regarded as a form of self-regulatory failure (insofar as optimizing speed–accuracy tradeoff is a vital aspect of regulating one's performance process). In Experiment 2, the performance of people with high self-esteem under ego threat was again the worst among the four cells in the design, but on an absolute basis it was not below their average for the preceding trials and therefore should not perhaps be labeled as *choking*.

Experiments 2 and 3 provided some evidence that people with high self-esteem responded to the ego threat by making higher, more optimistic commitments than people in other conditions. In Experiment 1 there was a nonsignificant trend suggesting that they set higher goals for themselves, and in Experiments 2 and 3 they made larger bets. The self-defeating nature of these commitments was apparent in the higher rate of total failure. Nearly half the high self-esteem subjects in the ego-threat condition of Experiment 2 lost all their money by placing the maximum bet and then failing to reach the criterion score. The same threat caused people with low self-esteem to make, on average, the lowest bets in the study, and they were therefore able to avoid the worst outcomes that plagued people with high self-esteem.

The picture that emerges from these findings is that people with high self-esteem normally can be quite effective at this sort of complex self-regulation because they manage to make accurate predictions, thereby enabling themselves to commit themselves to reachable, appropriate goals, and then they manage their performance so as to reach those goals successfully. Under ego threat, however, they cease to base their goal setting on rational, appropriate self-prediction and instead become concerned with saving face and making a good, self-enhancing impression (see also Baumeister, 1982). They then make their commitments on the basis of some idealized view of stellar performance, setting unrealistically high goals that lead to failure. They may also manage their performance inappropriately, such as by increasing speed at the expense of accuracy, which is characteristic of people trying to make an outstanding performance, but which can backfire and cause inferior performance.

Implications for Self-Esteem Stability

Our results suggested that people with high self-esteem are effective at choosing situations appropriate to their abilities.

Their superiority in this regard may help them maintain their high level of self-esteem. By regularly setting themselves up for success, they may manage to obtain confirmation of their favorable views of themselves. In contrast, people with low self-esteem appeared to be relatively less effective at setting appropriate goals for themselves, and so they may be relatively more prone to experience failures and meaningless successes, and such experiences may help keep their self-esteem low.

Recent work has suggested that people with high self-esteem have better self-knowledge than people with low self-esteem (Baumgardner, 1990; Campbell, 1990). Although we have incorporated this into our reasoning as a cause of the self-regulation differences we studied, there may also be some reciprocal causal influence such that the self-regulation differences help sustain the differences in self-knowledge. By setting inappropriate goals, people with low self-esteem may often fail to test their limits. They may end up choosing performance situations in which the feedback they receive tells them relatively little about their abilities. In contrast, people with high self-esteem set goals appropriate to their ability levels and thus may tend to receive feedback that helps adjust and fine-tune their self-appraisals.

Responses to ego threat were consistent with the broad tendency for people with high self-esteem to seek self-enhancement, whereas people with low self-esteem seek self-protection (Baumeister, Tice, & Hutton, 1989). The setting of high goals in response to threat can be regarded as a high-risk, high-payoff strategy that offered the individual a chance at a glorious success—but that increased the danger of costly failure. The response of people with high self-esteem was consistent with the view that they generally expect to succeed and so pay little attention to the risks and potential costs of failure. Furthermore, their quest for an outstanding performance extended beyond the setting of high goals to affect their performance style. As the crash data suggested, people with high self-esteem responded to ego threat with an aggressive, risky style of play that is common to people who are trying to achieve an outstanding performance.

Meanwhile, people with low self-esteem responded to ego threat with cautious, conservative, self-protective responses. They set low, safe goals, and there was some evidence that they altered their performance style toward greater caution (although this change in performance style was not replicated in Experiment 3). We have emphasized the adaptive nature of these responses, but it is also true that such responses are not likely to enhance self-esteem. Safely reaching an easy goal does not, after all, confer a great deal of prestige or glory on the self. Such small victories might be therapeutically valuable for people with extremely low self-esteem, but among university samples, people who score in the low half of self-esteem distributions are typically medium in self-esteem in absolute terms (Baumeister et al., 1989), and a moderate level of self-esteem is not likely to be improved much by a minor success. Thus, the cautious and self-protective responses of these people may perpetuate their self-esteem level too.

Implications for Performance Processes

As already noted, past work has generally failed to find any link between trait self-esteem and choking under pressure. Pre-

vious studies, however, generally used experimentally manipulated levels of pressure, whereas in the present study subjects were able to decide for themselves how much pressure would be present on their final performance (by setting the size of the reward that was contingent on that performance). We found that subjects with high self-esteem were more prone to fall short of their criterion and lose their money, possibly because they had increased the pressure on themselves by making higher bets. Although this research was not designed to study choking under pressure and it is necessary to be cautious about drawing any firm conclusions, our findings do raise the possibility that people with high self-esteem may be more willing than other people to put pressure on themselves and may as a result be more likely to perform poorly.

Two possible mechanisms (which may be compatible and could coexist) could contribute to the performance decrements among subjects high in self-esteem. The first is a transitory increase in self-awareness, which Baumeister (1984) identified as a crucial mediator of choking under pressure. Greenberg and Pyszczynski (1986) provided evidence that failure leads to an increase in self-awareness for everyone, and our ego-threat manipulations may have had that effect. Subjects with high self-esteem may have then prolonged that self-aware state by placing heavy performance pressure on themselves. That state may have then disrupted their skilled performance.

The second possible mechanism concerns the speed–accuracy tradeoff that was involved in the video task. Such tradeoffs form an important sphere for the self-regulation of performance, and people who are attempting to make an exceptionally good performance tend to increase their speed, often at the expense of accuracy (e.g., Heckhausen & Strang, 1988). Our data on frequency of crashes support the hypothesis that people with high self-esteem approached their final, money trial in this way. Their desire to counter the ego threat (see also McFarlin & Blascovich, 1981), and their consequent setting of high goals for themselves, may both have produced a wish to perform at an exceptionally high level. Speed is an effortful, controllable process, whereas accuracy depends on skill and is hence less subject to conscious control, and so these people may have tried to improve their performance in the manner seemingly most available to them, namely, increasing speed. The result, apparently, was counterproductive, presumably because increasing speed often leads to a reduction in accuracy. Still, all these remarks are largely speculative and remain for further research to verify.

In generalizing from our task performance data, it is important to keep in mind that not all tasks use the same processes or obey the same principles. Effortful persistence, for example, is far more controllable than skilled performance, and the present results (involving skilled performance) should not be uncritically generalized to effort or persistence. Baumeister, Hutton, and Cairns (1990) argued that effort and skill should be fundamentally distinguished in discussions of task performance, and they provided one example of opposite effects deriving from the same manipulation—specifically, they found that praise enhanced effort but impaired skill. Our results (particularly the crash data) are consistent with the view that people with high self-esteem respond to ego threat by increasing effort, which may be counterproductive when a speed–accuracy tradeoff is

involved (because effort, in the form of speed, will end up detracting from accuracy, which requires skill), but the same response could produce positive effects if effort or persistence were the sole measure or sole determinant of task performance (cf. McFarlin, 1985; McFarlin, Baumeister, & Blascovich, 1984; Sandelands et al., 1988).

Conclusion

Several recent works have asserted that positive illusions, including a favorable self-image, are associated with superior adaptation and self-regulation (Bandura, 1989; Taylor, 1989; Taylor & Brown, 1988). Our results are largely consistent with that view to the extent that people with high self-esteem showed superior performance on a complex self-regulation task. Under optimal conditions that included the absence of an explicit ego threat, the presence of a full range of options, and (in Experiment 3) an initial, encouraging success experience, people with high self-esteem were quite effective at setting appropriate goals and living up to them, thereby maximizing their outcomes.

Our results do suggest one important qualification to this favorable view of high self-esteem and positive illusions, however. An ego threat disrupted the self-regulatory effectiveness of people with high self-esteem. Faced with such a threat, these people seemed to allow self-enhancing illusions to affect their decision process and hence committed themselves to goals that they were not able to meet. High self-esteem may be subjectively pleasant and often advantageous, but allowing positive illusions to influence one's decision and commitment processes can be a recipe for failure.

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