On knowing when to quit: Task failure, self-esteem, advice, and nonproductive persistence

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Abstract

Past research has found the performance of persons with high self-esteem to improve after failure, especially on tasks for which persistence correlates positively with performance. However, persistence may be nonproductive in some situations. Experiment 1 used a task for which persistence and performance were uncorrelated; subjects high in self-esteem persisted longer but performed worse than did those with low self-esteem, particularly after prior failure feedback. Experiment 2 tested whether differential sensitivity to advice about the efficacy of persistence mediates nonproductive persistence. High self-esteem subjects who received explicit advice against nonproductive persistence on a puzzle-solving task still tended to persist longer on unsolvable puzzles than did low self-esteem subjects. The implications of high self-esteem subjects' tendency to engage in nonproductive persistence are discussed.

Following initial failure, persons high in self-esteem tend to perform better than do persons with low self-esteem (e.g., Perez, 1973; Schalon, 1968; Shrauger & Rosenberg, 1970; Shrauger & Sorman, 1977). Janoff-Bulman and Brickman (1982) have suggested that such improvements in the performance of persons with high self-esteem may be due to an increase in persistence. This suggestion seems consistent with previous work. For example, Shrauger and Sorman (1977) demonstrated that high self-esteem subjects persisted more (and performed better) than did lows after receiving failure feedback on an anagram task. These authors found an overall positive correlation between persistence and performance on their task.

It should be pointed out, however, that the opposite performance pattern (i.e., low self-esteem persons outperforming high self-esteem

persons after failure) has occasionally been observed (e.g., Baumeister
& Tice, Note 1; Silverman, 1964). Persistence may have been uncorre-
lated with performance on Silverman's (1964) task, however; this may
have accounted for the reversal of the typical pattern of superior (post-
failure) performance by persons with high self-esteem.

It is important to know whether the improved performance typically
manifested by persons high in self-esteem after failure is mediated by
increased persistence, because in some settings persistence may be
nonproductive, i.e., it may not lead to better performance (Janoff-
Bulman & Brickman, 1982). For example, continuing to persist on a set
of unsolvable anagrams results only in frustration and wasted effort.
Investors who refuse to give up on losing stocks may be making a similar
but more costly mistake. The present investigation was designed to
demonstrate just such nonproductive persistence in the way persons
with high self-esteem respond to failure.

Our reasoning was as follows. Failure is presumably unusual and
unexpected for persons with high self-esteem—which is why their self-
esteem is high. Confronted with a failure experience, they still expect
subsequent success (McFarlin & Blascovich, 1981). In part this may be
due to the fact that a person's expectation of future performance levels
is based on a long history of past feedback, which outweighs the single
datum constituted by the most recent performance outcome (cf. Jones,
Rock, Shaver, Goethals, & Ward, 1968). Ironically, though, McFarlin
and Blascovich showed that subjects high in self-esteem predicted better
future performance when they had recently failed than when they had
recently succeeded, which suggests that a motivational factor—and not
performance history—influenced subjects' predictions. McFarlin and
Blascovich suggested that subjects with high self-esteem may have
determined to do better as a way of offsetting the initial failure, as in
compensatory self-enhancement (Baumeister & Jones, 1978). Compen-
satory self-enhancement following failure has been shown to be espe-
cially associated with high self-esteem (Baumeister, 1982), so this sug-
gestion seems plausible.

The increased motivation to succeed (after an initial failure) may then
result in increased effort being exerted by persons high in self-esteem.
Persistence is one form of effort. It deserves mention that the heightened
expectation of success may itself have contributed to increased persis-
tence. Studies with unsolvable problems have shown that personal
expectations of success lead to considerable persistent effort (e.g.,
Feather, 1961, 1962; Weiss & Sherman, 1973), even when this effort is
nonproductive.

Experiment 1 of the present investigation was therefore designed to
show that increased persistence is the characteristic response to failure

among persons high in self-esteem, even when persistence may be nonproductive. As Janoff-Bulman and Brickman (1982) suggest, continuing to engage in nonproductive persistence may actually impair the performance of persons with high self-esteem.

Experiment 1

Method

Design and Subjects

The experimental design for this study was a 3 × 3 completely randomized factorial design (Kirk, 1968). The factors were level of self-esteem (high, moderate, and low), and type of performance feedback (success, failure, and no feedback). Ninety-three male Introductory Psychology students at SUNY–Buffalo participated as part of their course requirements.

Procedure

All subjects initially completed the Texas Social Behavior Inventory (TSBI; Helmreich & Stapp, 1974) as part of a mass testing administration prior to and not connected with this experiment. The TSBI and the Janis and Field (1959) scale (see Experiment 2) are established instruments that are commonly used in research to measure self-esteem. Both focus especially on social aspects of self-esteem. Using measures with a social emphasis seemed appropriate in the present research because social skills are likely to be an important source of self-esteem for college students. Congruent with this assumption, Shrauger's (Note 2) recent work examining the components of self-confidence suggests that social competence may be the single *most important* source of self-esteem among college student subject populations.

Scores on the TSBI ranged from 27 to 62. Subjects who scored in the upper third (i.e., scores from 46 to 62) were designated as high, the middle third (i.e., scores from 40 to 45) as moderate, and the bottom third (i.e., scores from 27 to 39) as low, in self-esteem. Subjects from each category were then randomly assigned to one of three feedback conditions: success, failure, or no feedback (control).

During the experimental session, subjects were seated at a table in a small room containing a slide projector. The experimenter then gave subjects task instructions and proceeded to show three slides containing sample task items. The task used was the Remote Associates Test (RAT), originally developed by Mednick (1962). An RAT item consists of three stimulus words to which subjects were instructed to provide a fourth word related to each of the three stimulus words. For example, for the stimulus words "elephant," "lapse," and "vivid," a fourth related word would be "memory."

A set of ten RAT items was then shown. Subjects were given 60 seconds to solve each item. Depending on their feedback condition, subjects saw either ten easy (success), ten hard (failure), or five easy and five hard (control) items. Subjects recorded their answers on a separate answer sheet.

Answers were then graded and subjects in the success and failure conditions told how many of their responses were correct:

> You got 0–10 right. You did very well—your score is way above average. (success condition)
> You got 0–10 right. You did very poorly—your score is way below average. (failure condition)

Subjects in the control condition were neither told their scores nor given any evaluative feedback. A questionnaire dealing with subjects' perception of their performance on the RAT was then administered. Subjects were then told the following:

> We'll go on with the rest of the experiment now by having you take a second set of RAT items. This time, however, the procedure will be somewhat different in that *you* will control the slide projector. You may view the slides in any order and as many times as you wish. You are not required to put an answer down for every item. If you are having trouble with an item you can skip it if you wish. In addition, there is no time limit for completion of these items—you can work as much or as little as you wish.

Before subjects began working they were shown how to use the slide projector and given a new answer sheet. All subjects were given an identical set of ten new and moderately hard RAT items to work on. The amount of time subjects spent working (persistence) was recorded.

Our pilot work with the RAT suggested that few, if any, subjects would choose to work as long as 20 minutes on the task. Pilot subjects quickly discovered that persistence tends not to pay off with the RAT, and quit working within 20 minutes. Therefore, we decided to use 20 minutes as our cutoff point. If a subject worked past the 20 minute mark, the experimenter was to stop the subject under the pretext that another subject was waiting to be run through the experiment.

After they finished working, subjects were fully debriefed.

Results

Scoring. The amount of time (0–20 minutes) subjects chose to work on the second set of RAT items served as a behavioral measure of persistence. RAT performance was evaluated in terms of the number of items answered correctly (0–10). All questionnaire measures were scored from − 3 (e.g. very poorly) to + 3 (e.g., very well). The post hoc comparisons of means reported below were based on the Newman-Keuls procedure (Alpha = .05).

Manipulation checks. A main effect for feedback was found for subjects' perception of their performance on the first set of RAT items, $F (2,84) = 162.27$, $p < .00001$. Subjects in the success condition ($M = 1.87$) evaluated their performance significantly higher than did subjects in the control condition ($M = .60$) who in turn were significantly higher than were subjects in the failure condition ($M = − 2.63$).

Main effects for feedback were also found for subjects' perception of the difficulty of the first set of RAT items, $F(2,84) = 23,52$, $p < .00001$, and their aptitude for solving RAT items, $F(2,84) = 53.53$, $p < .00001$. Subjects in the failure condition perceived the first set of RAT items to be more difficult ($M = -2.16$) and felt they had less aptitude for solving RAT items ($M = -1.53$) than did subjects in the control condition ($Ms = -1.40$ and $-.43$, respectively) who in turn rated the RAT as more difficult and felt they had less aptitude than did subjects in the success condition ($Ms = -.16$ and 1.42, respectively).

Finally, the number of items answered correctly on the first set of RAT items served as a behavioral manipulation check. Again, only the main effect for feedback was significant, $F(2,84) = 163.40$, $p < .00001$. Success condition subjects (range $= 3-10$, $M = 7.81$) performed better than did control condition subjects (range $= 2-7$, $M = 3.87$) who in turn performed better than did failure condition subjects (range $= 0-7$, $M = .97$).

Behavioral measures. Out of 93 subjects, only eight were stopped because they were still working on the second set of RAT items after 20 minutes. Of these eight, six were in the success condition (two high, two moderate, and two low in self-esteem), one was in the failure condition (high self-esteem) and one was in the control condition (low self-esteem). Persistence and performance were analyzed both including and excluding data from these eight subjects. The two sets of results obtained were essentially identical and are reported below. Figures, however, are based on data from all 93 subjects.

Analyses including subjects stopped after 20 minutes. For subjects' persistence on the second set of RAT items, the main effect for self-esteem was marginally significant, $F(2,84) = 2.45$, $p < .09$. Comparison of means using the Newman-Keuls procedure (alpha $= .05$) revealed that high self-esteem subjects in the failure condition ($M = 13.78$ minutes) persisted significantly longer than did moderate and low self-esteem subjects in the failure condition ($Ms = 10.36$ and 10.56 minutes, respectively). Persistence in the success and control conditions did not vary as a function of self-esteem. The Self-Esteem × Feedback interaction was not significant (see Figure 1).

There was a significant main effect for self-esteem on number of items answered correctly, $F(2,84) = 3.52$, $p < .05$. Across experimental conditions, low self-esteem subjects ($M = 5.57$) performed *better* than did moderate self-esteem subjects ($M = 4.88$) who in turn did better than did high self-esteem subjects ($M = 4.19$). Although the Feedback × Self-Esteem interaction was not significant, these performance differences as a function of self-esteem tended to be greatest in the failure condition (see Figure 2).

Analyses excluding subjects stopped after 20 minutes. For subjects' persistence on the second set of RAT items, the main effect for self-esteem was marginally significant, $F(2,76) = 2.75$, $p < .075$. Comparison of means revealed that high self-esteem subjects in the failure condition ($M = 13.16$ minutes) persisted significantly longer than moderate and low self-esteem subjects in the failure condition ($Ms = 10.36$ and 10.56 minutes, respectively). Persistence in the success and control conditions did not vary as a function of self-esteem. The Self-Esteem × Feedback interaction was not significant.

The main effect for self-esteem on number of items answered correctly was significant, $F(2,76) = 3.54$, $p < .05$. Across experimental conditions, low self-esteem subjects ($M = 5.63$) performed *better* than did moderate self-esteem subjects ($M = 4.90$) who in turn did better than did high self-esteem subjects ($M = 4.18$). The Feedback × Self-Esteem interaction was not significant.

Correlations between persistence and performance. Across all subjects, there was no correlation between persistence and performance ($r = -.05$, *ns*). There was a positive correlation, however, for low self-esteem subjects in the success and failure conditions ($r = .64$, $p < .05$). There was no correlation between persistence and performance for high self-esteem subjects in the success and failure conditions ($r = .04$, *ns*).

<center>Discussion</center>

As predicted, high self-esteem subjects tended to persist longer than did either moderate or low self-esteem subjects, especially after receiving failure feedback. Low self-esteem subjects, however, performed better than did high self-esteem subjects, especially after receiving failure feedback. It appears that relatively high persistence on the RAT was nonproductive for high self-esteem subjects.

We believe that high self-esteem subjects probably spent an inordinate amount of time trying to solve some of the more difficult RAT items. On the other hand, low self-esteem individuals probably did not get stuck and moved on when faced with difficult items. Initial failure may have reinforced high self-esteem subjects' tendency to try hard to solve difficult items (to compensate for unexpected failure) and low self-esteem subjects' tendency to give up on difficult items and move on to easier ones. In support of this explanation, a number of high self-esteem subjects reported during the debriefing that they had spent most of their time trying to solve one or two early, difficult items, became frustrated, and stopped working.

Our finding that high self-esteem individuals may sometimes engage in nonproductive persistence has two important implications. First, it suggests that when they experience unexpected failure, high self-esteem
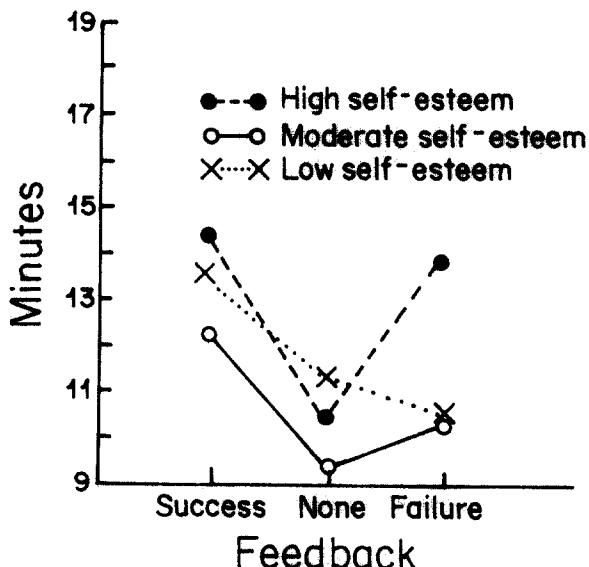
Figure 1. Subjects' persistence on the second set of RAT items

individuals' motivation to succeed may intensify, triggering some form of compensatory self-enhancement (e.g., trying to prove they could do better by refusing to give up on difficult RAT items following initial failure). This is congruent with Baumeister's (1982) finding that following failure, high self-esteem subjects tended to use compensatory self-enhancement to offset the negative feedback that they had received.

Second, our results support Janoff-Bulman and Brickman's (1982) notion that the tendency for individuals with high expectations (high self-esteem) to continue to persist, especially after failure, may sometimes prove maladaptive. High self-esteem subjects' apparent refusal to give up on difficult RAT items, especially after failure, resulted in nonproductive persistence and poorer performance relative to low self-esteem subjects.

Experiment 2

Janoff-Bulman and Brickman (1982) point out that the ability to discriminate when persistence will or will not lead to success is more valuable than merely having a general tendency to persist. Experiment 1 suggested that high self-esteem persons respond to failure with a general tendency to persist rather than with an attempt to ascertain whether persistence will be effective. As Janoff-Bulman and Brickman argue, if such persons ignore or fail to recognize the likelihood of failure, their persistence may be nonproductive, and that seems to be what
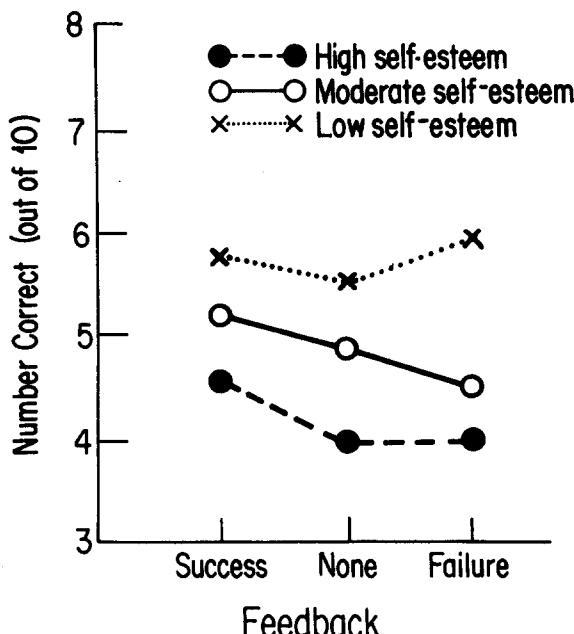
Figure 2. Subjects' performance on the second set of RAT items

happened in Experiment 1. One purpose of Experiment 2 was to replicate this pattern of nonproductive persistence exhibited by high self-esteem subjects using a different task and different methodology.

Instead of giving up and moving on to easier items, high self-esteem subjects in Experiment 1 may have spent most of their time grappling with a few difficult items. If so, they may have failed to recognize (or may have ignored) cues in the situation indicating that they should give up. High self-esteem subjects' previous experience with the first set of RAT items should have told them that solving RAT items is essentially an "aha" experience. Perhaps low self-esteem subjects simply did a better job of detecting such cues.

The notion that the low self-esteem individuals in Experiment 1 were more responsive to cues about the RAT runs counter, however, to Janoff-Bulman and Brickman's (1982) contention that individuals with high expectations make *better* use of information telling them when to quit than do individuals with low expectations. In a previous study, Janoff-Bulman and Brickman (Note 3) gave subjects who had either high or low expectations for performance on an upcoming anagrams task either no information or information that some of the anagrams were unsolvable. Subjects with high expectations were found to make better use of this information than were subjects with low expectations. High expec-

tation subjects quickly abandoned those anagrams that they had difficulty with and ended up solving more anagrams than did any other group of subjects.

The results of Experiment 1 appear to contradict Janoff-Bulman and Brickman's arguments regarding information use by high and low self-esteem individuals. Perhaps high self-esteem subjects in Experiment 1 simply lacked sufficient information about the RAT to make the kind of "informed" decision to quit that Janoff-Bulman and Brickman describe. On the other hand, high self-esteem subjects may have been preoccupied with a desire to compensate for their initial failure on the RAT and thus simply ignored cues suggesting that persistence tends not to pay off on the RAT.

Experiment 2 sought to determine how high and low self-esteem individuals respond to overt, salient cues about the efficacy of persistence. The cues provided were in the form of strategic *advice* as to whether persistence would or would not pay off on a puzzle-solving task. This is in contrast to Janoff-Bulman and Brickman's (Note 3) more *informational* manipulation in which subjects were specifically told that some anagrams they would be working on were unsolvable.

Overview and Predictions

High and low self-esteem subjects were given a fixed amount of time to solve a series of eight puzzles. Half of the subjects were told that the best strategy for the task was to give up and move on when faced with a difficult puzzle ("quit" advice), while the other half were told that the best approach was to stick to each puzzle until it was solved ("persist" advice). The major dependent variable was how long subjects spent on Puzzles 2 and 3, which were unsolvable.

We predicted that, as in Experiment 1, high self-esteem subjects would engage in nonproductive persistence, especially after failing to solve Puzzle 2. Moreover, this nonproductive persistence would occur despite advice to abandon work on difficult items. This prediction is at odds with Janoff-Bulman and Brickman's (1982) contention that individuals with high expectations are better able to use cues telling them to quit than are individuals with low expectations.

Method

Design and Subjects

A 2 × 2 completely randomized factorial design was employed. The factors were level of self-esteem (high, low) and nature of task advice (quit, persist). Forty-seven undergraduates (24 males and 23 females) participated to fulfill various requirements.

Procedure

Subjects were greeted by a male experimenter and run individually. Subjects were first given Silverman's (1964) adaptation of Janis and Field's (1959) Self-Esteem Scale. The Silverman adaptation drops one item (frequency with which individuals tend to blame themselves for their mistakes) from the original 23-item scale. Fleming and Watts (1980) recently provided evidence for the construct validity of the Janis and Field scale as a measure of both social self-esteem and general self-regard.

Subjects then heard a cover story about being in a control condition for a study of the effects of noise stress on task performance. A median split of self-esteem scores was used to differentiate between high and low self-esteem subjects (scores ranged from 17 to 91, median = 60).

After indicating that it was important that the subject do as well as he or she could, the experimenter then explained the rules for a puzzle-solving task. The subject was confronted with eight stacks of paper. Each stack contained many copies of the same puzzle. The object of each puzzle was to trace a geometric figure without lifting one's crayon from the paper and without retracing any line (this task, and the majority of the puzzles used, were taken from Glass & Singer, 1972). The experimenter explained that the subject would have seven minutes to solve as many of the puzzles as possible, and that the puzzles must be done in the sequence in which they were arranged on the desk, going from left to right. The experimenter added that because some of the puzzles were quite difficult, the subject was allowed to give up on a puzzle without solving it and to continue on to the next one; however, once the subject did this, he or she was not allowed to go back.

At this point, the advice manipulation was administered. For half the subjects, the experimenter said:

> Now, proceed however seems best to you. My feeling is that most people will do best to stick with each one until they get it, rather than skipping ahead. But, you know, you should do whatever seems best to you.

For the other subjects, the second sentence was changed so that the experimenter said, "My feeling is that the way most people will do best is, if you don't get a solution in two or three tries, go right onto the next, rather than spending too much time on one puzzle." The two sentences exhorting the subject to do whatever seemed best to him or her were the same for all subjects.

The experimenter said that he would sit on the opposite side of the room, facing away from the subject, so as not to make the subject nervous. The experimenter then added:

> I am supposed to keep track of how long people spend on each puzzle. So when you finish a puzzle either because you've solved it or because you've decided not to do that one any more, just say "Next" and I'll record the time. I of course won't say anything while you're working.

After answering any of the subject's questions, the experimenter then told the subject to feel free to use as many slips of paper for each puzzle as he or she

desired. The experimenter then moved to a chair on the opposite side of the room, picked up his stopwatch and notebook, and said, "Begin."

Subjects were led to believe that all of the puzzles were solvable, but in fact some were not. The puzzle in the first stack was quite easy, and most subjects solved it in 15 to 30 seconds. However, the next two puzzles were unsolvable (Puzzle 4 was solvable). It should be made clear at this point that because Puzzles 2 and 3 were unsolvable, the "persist" advice was actually bad advice. The "quit" advice was better in that it suggested a more effective approach to the task. The dependent measure of interest was how long subjects spent working on Puzzles 2 and 3.

The purpose and design of the experiment was revealed to each subject at the end of the session. The rationale for the inclusion of unsolvable puzzles was carefully explained.

Results

Manipulation check. To check on the advice manipulation, subjects were asked during the debriefing if they recalled the "suggestion" the experimenter had made about how to approach the task. All subjects correctly recalled the advice they had received.

Time spent on unsolvable puzzles. The main dependent variable was the total length of time in seconds spent on Puzzles 2 and 3, which were unsolvable. Unweighted means analysis of variance revealed a strong main effect for the advice manipulation, $F(1,43) = 61.20$, $p < .001$, with both high and low self-esteem subjects persisting longer in the persist than in the quit condition. In addition, the interaction between advice and self-esteem level was significant, $F(1,43) = 7.20$, $p < .02$. Planned comparisons using two-tailed t tests revealed that while high self-esteem subjects persisted significantly longer than did low self-esteem subjects in the quit condition, $t(43) = 2.17$, $p < .025$, the two groups did not differ significantly in the persist condition, $t(43) = 1.40$, *ns* (see Table 1 for cell means). Thus, high self-esteem subjects persisted longer in the face of "quit" advice than did low self-esteem subjects.

Reaction to failure. A main concern of the present investigation was how subjects responded to failure. Some insight into this can be gained

Table 1. Mean number of seconds spent on both unsolvable puzzles as function of self-esteem and advice.

Self-esteem	Advice	
	Persist	Quit
High	311.33$_a$	217.36$_b$
Low	355.55$_a$	168.11$_c$

Note.—Means with different subscripts are significantly different at the .05 level.

by examining whether subjects worked for a longer or shorter time on Puzzle 3 after failing to solve Puzzle 2. These data can only be interpreted in the "quit" condition because many "persist" subjects were still working on Puzzle 2 or 3 when time ran out.

Ten of the 14 high self-esteem subjects in the quit condition spent *longer* on Puzzle 3 than on Puzzle 2, whereas only two of the nine low self-esteem subjects did so. This difference was significant, $\chi^2 = 7.34$, $p < .01$; Fisher's exact text gives a one-tailed probability of .003. A two-tailed t test performed on the *difference* between time spent on Puzzles 2 and 3 was also significant, $t(21) = 2.60$, $p < .01$. On the average, low self-esteem subjects in the quit condition persisted 19.00 seconds *less* on Puzzle 3 than they did on Puzzle 2. High self-esteem subjects in the quit condition, however, persisted an average of 17.93 seconds *more* on Puzzle 3 than they did on Puzzle 2. Thus, it appears that low self-esteem subjects were willing to accept failure on Puzzle 2 and responded to it by following the experimenter's advice to quit all the sooner on Puzzle 3. High self-esteem subjects, on the other hand, appeared unwilling to accept failure and persisted longer on Puzzle 3, despite advice not to persist (see Table 2 for cell means).

Discussion

The results indicated that both high and low self-esteem subjects were aware of the advice given about how to approach the task and followed it to some extent. Regardless of their level of self-esteem, subjects spent more time on Puzzles 2 and 3 when given advice to persist than when given advice to quit. Neither high nor low self-esteem subjects in the persist condition seemed able to detect the fact that the advice they were given was a "bum steer."

Of more importance, however, was the interaction observed between type of advice and self-esteem. After advice not to persist, high self-esteem subjects persisted longer on Puzzle 3 than did low self-esteem subjects. In addition, while high self-esteem subjects in the "quit" condition increased the amount of time spent on Puzzle 3 relative to

Table 2. Mean number of seconds spent on two unsolvable puzzles in the quit condition.

Self-esteem	Unsolvable puzzle	
	Puzzle 2	Puzzle 3
High	99.71$_a$	117.64$_b$
Low	93.56$_a$	74.56$_c$

Note.—Means with different subscripts are significantly different at the .05 level.

Puzzle 2, low self-esteem subjects decreased the amount of time. This pattern of results is congruent with our prediction that high self-esteem subjects would engage in nonproductive persistence on Puzzle 3 after failing to solve Puzzle 2, despite advice to the contrary.

The self-presentational ramifications of taking advice may have mediated the results of Experiment 2. If one follows advice and succeeds, one must share the credit with one's advisor. By the same token, though, one can share the blame for failure if one has followed someone's advice. In this view, the advice-taking tendencies of persons low in self-esteem would seem to reflect a self-protective orientation, and their increased adherence to the advice after failure on Puzzle 2 would seem to reflect an increased concern with protecting the self from the negative implications of failure. In contrast, the behavior of subjects high on self-esteem can be seen to reflect a self-enhancing orientation, for ignoring advice will enhance one's credit for success, even though it also increases the extent to which failure makes one appear foolish.

Differences in performance expectancies may help explain the apparent self-enhancing orientation of high and self-protective orientation of low self-esteem individuals in the quit condition in Experiment 2. Carver, Blaney, and Scheier (1979) showed that when individuals are cognizant of their performance expectancies, they tend to respond to failure as a function of these expectancies. High performance expectancies tend to result in increased persistence following failure, whereas low performance expectancies resulted in decreased persistence.

It has been argued that while high self-esteem individuals tend to expect success and perceive a positive relation between their effort and performance, low self-esteem individuals tend to expect failure and perceive a lack of contingency between their effort and performance (cf. Cohen, 1959). Thus, failure to solve Puzzle 2 may have prompted high self-esteem subjects to ignore advice to quit and confidently redouble their efforts on subsequent puzzles. On the other hand, the tendency of low self-esteem individuals to give up in the face of failure because of low performance expectations may be reinforced by quit advice. In Experiment 2, quit advice may have had the effect of confirming low self-esteem subjects' preexisting performance expectations when they failed to solve Puzzle 2, resulting in the decrease in persistence on Puzzle 3. In addition, if persistence does not pay off and continued failure seems likely, following advice to quit may be self-protective to some extent in that one can share the blame for failure.

General Discussion

Our results indicate that individuals with high self-esteem may be prone to engage in nonproductive persistence in some situations. This

tendency to "beat one's head against the wall" is consistent with Janoff-Bulman and Brickman's (1982) contention that the persistence of persons with high expectations (here, high self-esteem), especially after a failure experience, may be nonproductive in some cases.

Our findings seem inconsistent, however, with Janoff-Bulman and Brickman's (1982) argument that high expectation individuals will tend to make better use of information telling them when to quit than do low expectation individuals. Experiment 1 suggested that high self-esteem individuals may actually ignore or reject information about when to persist in certain situations. High self-esteem subjects' initial experience with the RAT in Experiment 1 should have told them that persistence is not effective when it comes to the RAT. Experiment 2 lent further support to this by showing that high self-esteem subjects will continue to engage in nonproductive persistence, despite being aware of explicit advice to quit.

Some comment is necessary on the difference between our procedures and those of Janoff-Bulman and Brickman (Note 3). In our Experiment 2, subjects received a strategic tip about how to approach a task, whereas Janoff-Bulman and Brickman explicitly warned subjects that some anagrams would be unsolvable. The difference in the way information was conveyed in these two studies may account for the seemingly contradictory results.

Receiving advice is not the same as receiving information. As suggested above, there may be certain self-presentational ramifications in accepting the kind of general, strategic advice presented in Experiment 2. Our subjects were given a *suggested method* with which to approach the task. Following someone's suggested method entails sharing the credit if one succeeds and sharing the blame if one fails. These self-presentational concerns may have caused high self-esteem individuals to ignore advice, in order to succeed without having to share the credit (a self-enhancing approach).

In contrast to our manipulation of advice, the explicit information given by Janoff-Bulman and Brickman (Note 3) probably aroused few, if any, self-presentational concerns. It seems plausible that by simply telling subjects that some anagrams were unsolvable without suggesting a *method* for maximizing performance (i.e., strategic advice), Janoff-Bulman and Brickman removed the threat of having to share credit for success. If so, high self-esteem individuals would not be motivated to ignore such information in order to avoid having to share the credit for their success. In addition, because of their high performance expectancies, high self-esteem subjects may have been better able to use the type of information provided by Janoff-Bulman and Brickman than were low self-esteem subjects.

Assuming that high self-esteem individuals have confidence in their abilities and tend to expect success, we would predict that when faced with what may be one of the unsolvable anagrams, they would quickly give up and move on to the next anagram. Because they are presumably reluctant to attribute failure to their own lack of ability, persons with high self-esteem may readily accept the experimenter's explanation— that no solution exists—when faced with a difficult anagram. On the other hand, assuming that low self-esteem individuals have relatively little confidence in their abilities, facing an unsolvable anagram presents these individuals with a dilemma; viz., is the failure to solve an anagram due to lack of ability or task impossibility? Janoff-Bulman and Brickman (1982) argue that this kind of differential attribution process can account for the fact that in their 1976 study (Note 3) subjects with high performance expectations made better use of information telling them some anagrams were unsolvable than did subjects with low performance expectations. All in all, it is plausible that performance expectancies associated with level of self-esteem will cause very different reactions to advice as opposed to information.

We have demonstrated that on certain tasks, the responses of high self-esteem subjects may lead to suboptimal performance. However, it may be rare in everyday life that persons must face truly impossible tasks, much less be aware of such impossibility. In other words, life rarely confronts people with untraceable geometric figures or unsolvable anagrams. The relevance of our study to everyday life therefore needs to be clarified.

There are indeed many situations (other than working on impossible tasks in the laboratory) in which renewed effort may not be the optimal response to failure. When one action fails, trying it again with increased effort may bring additional failures; under other circumstances, it may bring about a costly or inefficient success that could have been easily surpassed by alternative courses of action. In warfare, once a frontal assault is repulsed, repeated frontal assaults may result in even worse defeats, or at best, Pyrrhic victories, whereas flanking maneuvers or a siege might have brought clear-cut victories (see Tuchman, 1978, for vivid examples). In football, if a screen pass play fails once, repeated attempts may eventually furnish a successful screen pass, but other plays might have a better chance of winning the game. In science, if a researcher finds the journals unwilling to publish an article because of its methodology, the optimal strategy (at least for untenured researchers!) may be to revise the methodology, not to conduct more experiments in the same fashion. In investing, holding on to losing stocks for a long time may eventually enable one to recoup one's money and even make a profit, but far greater profits might have been realized by selling

quickly at a loss (i.e., giving up on that company) and reinvesting the money elsewhere. Thus, the practical implications of our results are not trivialized by the possible rarity of tasks which are, unbeknownst to the performers, actually impossible to succeed at. Responding to failure by simply increasing effort may often be less than the optimal response, even if it does eventually lead to limited success.

A broader theoretical issue concerns the characterization of high self-esteem. As we have noted, previous studies have often demonstrated that the performance of high self-esteem persons improves after failure. Such findings create the impression that high self-esteem individuals react rationally to failure by finding the optimal response. Our results suggest this impression is mistaken. Rational optimization may be the ideal response to failure, but it is apparently not the prepotent response of high self-esteem individuals. Instead, they seem to try harder, which is a response that may sometimes seem rational (because, as in previous research, it often works) but is not necessarily so. Notterman and Mintz (1965) demonstrated that when steady reinforcement is abruptly suspended, rats will bar press with increased physical force. The immediate response of high self-esteem persons to failure may be no more thoughtful (nor optimal) than is the behavior of those rats.

Janoff-Bulman and Brickman (1982) were unusual in suggesting that high self-esteem could have maladaptive consequences. Our impression is that many researchers tend to equate high self-esteem with healthy and optimal functioning. We suggest, however, that high self-esteem can mean delusionally conceited as easily as low self-esteem can mean pathologically insecure. In past research, high self-esteem subjects' response to failure has seemed to reflect healthy and optimal functioning because they subsequently performed better—but on tasks for which persistence and performance were *positively* correlated (e.g., Shrauger & Sorman, 1977). However, our attempt to unconfound persistence and performance seems to show that it is the increased persistence after failure—even when nonproductive—that is the essence of high self-esteem individuals' response.

One last issue deserves comment. Our assumption that frequent success is what originally creates high self-esteem raises a possibly limiting consideration regarding our results. If a person with high self-esteem were to experience a long series of failures due to fruitless persistence, it is plausible that his or her self-esteem would eventually decline. Suboptimal successes or Pyrrhic victories may, however, permit the maintenance of high self-esteem despite the detrimental effects of persistence. Still, we assume that in general persons with high self-esteem do not typically spend their lives in pursuit of lost causes. Rather, they may be chronically vulnerable to the pattern we have demonstrated and may occasionally suffer because of it.

Reference Notes

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