

Why Do People Need Self-Esteem? Converging Evidence That Self-Esteem Serves an Anxiety-Buffering Function

Jeff Greenberg • University of Arizona
 Sheldon Solomon • Skidmore College
 Tom Pyszczynski • University of Colorado at Colorado Springs
 Abraham Rosenblatt • University of California, San Francisco
 John Burling • University of Montevallo
 Deborah Lyon • University of Arizona
 Linda Simon • University of Arizona
 Elizabeth Pinel • University of Colorado at Colorado Springs

Three studies were conducted to assess the proposition that self-esteem serves an anxiety-buffering function. In Study 1, it was hypothesized that raising self-esteem would reduce anxiety in response to vivid images of death. In support of this hypothesis, subjects who received positive personality feedback reported less anxiety in response to a video about death than did neutral feedback subjects. In Studies 2 and 3, it was hypothesized that increasing self-esteem would reduce anxiety among individuals anticipating painful shock. Consistent with this hypothesis, both success and positive personality feedback reduced subjects' physiological arousal in response to subsequent threat of shock. Thus, converging evidence of an anxiety-buffering function of self-esteem was obtained.

A diverse array of classic and contemporary psychological theories converge on the notion that people have a strong and pervasive need for self-esteem (e.g., Allport, 1961; Becker, 1962, 1973; Horney, 1937; Rogers, 1959; Snyder, Stephan, & Rosenfield, 1976; Steele, 1988; Tesser & Campbell, 1983). From William James's *Principles of Psychology* to the most recent issues of scholarly journals, one can find a multitude of conceptual analyses and empirical studies in which a need for self-esteem has been used to explain

various forms of behavior. Indeed, Scheff (1990) has noted that there are over 10,000 published studies concerning self-esteem and its correlates.

Given this consensus that self-esteem is a vital human need, it is important to understand why people need self-esteem; unfortunately, this question has been all but ignored by contemporary social scientists. We recently proposed a *terror management* theory of social behavior, which posits that people are motivated to maintain a positive self-image because self-esteem protects them from

anxiety. The three experiments reported in this article tested this proposition.

Terror Management Theory

Terror management theory (Greenberg, Pyszczynski, & Solomon, 1986; Solomon, Greenberg, & Pyszczynski, 1991b), which is based largely on the writings of Ernest Becker (1962, 1973, 1975), was developed to address a variety of interrelated questions concerning what self-esteem is, what psychological function it serves, and how it is related to other aspects of the individual's conception of reality. The theory proposes that self-esteem is the feeling that one is an object of primary value in a meaningful universe. Individuals sustain self-esteem by maintaining faith in a culturally derived conception of reality (the cultural worldview) and living up to the standards of value that are prescribed by that worldview. From the perspective of terror management theory, people need self-esteem because it is the central psychological mechanism for protecting individuals from the anxiety that awareness of their vulnerability and mortality would otherwise create.

The roots of this connection between self-esteem and protection from anxiety reside in the individual's early interactions with his or her parents and other socializing agents of the culture. As a variety of theorists have noted, in early childhood, the need fulfillment, love, and protection afforded by the parents comprise the virtually helpless child's primary basis of security (e.g., Bowlby, 1969; Horney, 1937; Rogers, 1959; Sullivan, 1953). Over the course of childhood, these commodities become increasingly contingent on meeting parental standards of goodness and value. As these standards become internalized, this contingency leads to an association between the perception that one is meeting internalized standards of value (self-esteem) and feelings of safety and security. This association is reinforced throughout life, both directly, through the responses of others to one's behavior, and vicariously, through cultural teachings and myths in which the virtuous are rewarded and the evil are punished.

The basic message that is transmitted through such teachings is that the world is a just place where aversive events can be avoided by being a good, valuable person (cf. Lerner, 1980). Beyond

that, societal standards of value also serve as requirements for death transcendence through literal and symbolic immortality (e.g., afterlife, prosperous children, and cultural achievements).¹ Self-esteem thus provides protection from anxiety because it is the prerequisite for feeling loved, safe, and secure (see Solomon et al., 1991b, for a more extensive discussion of how self-esteem acquires its anxiety-buffering function).

The initial research concerning terror management focused on the worldview component of the cultural anxiety buffer. The general strategy taken in this research was to test the proposition that if one's worldview serves an anxiety-buffering function, then reminding subjects of the source of their anxiety should increase their need for the buffer and thus intensify their reactions to anyone or anything that impinges on it. In support of this notion, 13 experiments have shown that reminding subjects of their mortality leads them to respond especially favorably to those who bolster their worldviews and especially unfavorably to those who threaten them (Greenberg, Pyszczynski, Solomon, Rosenblatt, et al. 1990; Greenberg, Simon, Solomon, Pyszczynski, & Lyon, 1992; Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). For example, Greenberg et al. (1990) found that for Christian subjects, mortality salience increased liking for a fellow Christian and decreased liking for a Jew. These studies have also ruled out a variety of alternative explanations for these findings. In addition, Greenberg, Simon, Pyszczynski, et al. (1992) found evidence that mortality salience

¹Although the specific modes of immortality vary from culture to culture and across historical periods (see e.g., Rank, 1931/1961), most cultures promise literal immortality to those who qualify, through souls or spirits that continue to exist in some form after physical death. These spiritual or collective modes of immortality are often supplemented by symbolic forms of immortality striving, ways of feeling that one is making some permanent mark on reality. In modern western culture, these modes include children, accumulated wealth, estates, socially valued accomplishments, awards, memorials, and so forth. It is important to keep in mind that cultural worldviews are structured so that all of these paths to immortality involve meeting the requirements of goodness or value prescribed by the particular worldview. Being a good, valuable person is the required qualification for immortality in whatever cultural forms it takes; self-esteem is thus the belief that makes one feel immortal.

motivates adherence to the values prescribed by one's worldview as well as defense of that worldview. None of this research has, however, directly assessed the role of self-esteem in buffering anxiety.

Empirical Evidence Consistent With the Anxiety-Buffer Proposition

Although we know of no previous experimental studies of the psychological functions of self-esteem, there are two huge literatures, one correlational and one experimental, that are generally consistent with the proposition that self-esteem functions to buffer anxiety. Although even a cursory review of these literatures would be beyond the scope of this article (for reviews, see Solomon et al., 1991a, 1991b), several findings are especially relevant to present concerns.

The correlational literature is replete with evidence of positive associations between self-esteem and various indexes of mental and physical well-being (e.g., Antonucci & Jackson, 1983; Hobfoll & Leiberman, 1987; Lester, 1986) and negative associations between self-esteem and anxiety and anxiety-related problems (e.g., French, 1968; Lipsitt, 1958; Rosenberg & Simmons, 1972). Although the correlational nature of these findings precludes causal inference, they are consistent with the notion that self-esteem serves an anxiety-buffering function.

The experimental literature on threats to self-esteem is also generally consistent with this idea. If self-esteem protects people from anxiety, then threats to self-esteem should produce anxiety; research using both self-report and physiological indexes has shown that they do (e.g., Bennett & Holmes, 1975; Burish & Houston, 1979). In addition, when threatened, people should engage in strategies to defend or restore self-esteem. There is a large body of evidence demonstrating that threats to self-esteem do indeed produce defensive reactions to either defuse the specific threat or to restore a more general sense of self-worth (see Greenberg et al., 1986, for a review).

It also seems fairly clear that these defensive maneuvers are mediated by the negative affect produced by threats to self-esteem. Research has shown that (a) high levels of arousal in response to failure are associated with self-serving external

attributions (Brown & Rogers, 1991), (b) encouraging subjects to attribute any arousal they experience after failure to a neutral source reduces their tendency to engage in such defenses (Fries & Frey, 1980; Stephan & Gollwitzer, 1981), (c) increasing subjects' perceived level of arousal increases their tendency to engage in such defenses (Gollwitzer, Earle, & Stephan, 1982; Stephan & Gollwitzer, 1981), and (d) anxiety is reduced when threatened individuals defend their self-esteem (e.g., Bennett & Holmes, 1975; Hakmiller, 1966; Mehlman & Snyder, 1985).

The correlational and experimental findings just noted are all consistent with the proposition that self-esteem protects individuals from anxiety: People low in self-esteem tend to be anxious, threats to self-esteem cause anxiety, and defense of self-esteem reduces anxiety. However, to directly assess whether self-esteem buffers anxiety, it would be necessary to manipulate self-esteem, expose subjects to threat, and then measure anxiety. If self-esteem serves an anxiety-buffering function, then when exposed to threatening stimuli subjects whose self-esteem has been bolstered should exhibit less anxiety than subjects whose self-esteem has not been altered. The research reported in this article was designed to provide several converging tests of this general hypothesis.

Study 1

Study 1 was designed to test the hypothesis that increasing self-esteem reduces anxiety in response to threat. Because terror management theory views concern about vulnerability and mortality to be the ultimate basis of all anxiety (for an extended discussion of this relationship, see Pyszczynski, Greenberg, Solomon, & Hamilton, 1990; Solomon et al., 1991b), we chose to manipulate threat by exposing half of our subjects to a graphic video depiction of death-related scenes and the remainder to a neutral video. Before this threat induction, self-esteem was manipulated by providing subjects with either highly positive or neutral feedback on a bogus personality test. If self-esteem provides protection from anxiety, then increased-self-esteem subjects should experience less anxiety in response to the threatening film than neutral self-esteem subjects.

Method

SUBJECTS

Subjects were 52 male students who participated in partial fulfillment of a course requirement and who had previously participated in a mass testing session. Male subjects were selected for the study because during pilot sessions, female subjects expressed great discomfort with the death video; although male subjects also expressed some discomfort during debriefings, none of them objected to seeing the film or seemed excessively distressed.

PROCEDURE

Experimental sessions were conducted in groups of 3 to 5 subjects per session. Subjects were randomly assigned to self-esteem and threat conditions. The experimenter was unaware of the self-esteem manipulation.

On arrival, subjects were told that the study concerned the relationship between personality traits and reactions to emotionally arousing stimuli; this cover story provided a rationale for the death video. They were then given a consent form, which stated that they would view scenes from a video, after which their reactions would be assessed. The video constituted the threat manipulation. Threat subjects were informed in the consent statement that the video included scenes of an autopsy and an electrocution so that they were truly informed regarding the most impactful aspect of the study before consenting to participate.

The experimenter then explained that subjects' personality characteristics had already been measured in the previous mass testing session and that she was required to give them individual reports on the results of these tests. This feedback constituted the self-esteem manipulation. Subjects then read the bogus personality feedback in individual cubicles and filled out a questionnaire regarding the feedback. They then returned to the main room to view the video and were given the dependent measure and a check on the self-esteem manipulation. When everyone finished, subjects were probed for their reactions to the study and thoroughly debriefed.

SELF-ESTEEM AND THREAT MANIPULATIONS

The self-esteem manipulation was presented in the form of a psychological assessment report that had the subjects' names at the top of the page. On the

basis of previous research on the Barnum effect (e.g., Forer, 1949) the feedback was highly general in nature so that it could plausibly apply to all subjects. It was designed to convey either a positive or neutral evaluation of the subject's personality. For example, in the neutral feedback condition it was stated "While you have some personality weaknesses, you are generally able to compensate for them" and "Some of your aspirations may be a bit unrealistic." Similarly, in the positive feedback condition, it was stated "While you may feel that you have some personality weaknesses, your personality is fundamentally strong" and "Most of your aspirations tend to be pretty realistic." With the exception of such minor changes in wording to convey different meaning, the two forms of feedback were similar with respect to content and length.

The threat manipulation was created by selecting scenes from the video documentary *Faces of Death, Volume 1*. This video graphically presents various ways in which individuals die.² The scenes selected for the threat condition included actual footage of an autopsy and an electrocution of an inmate on death row. The neutral scenes selected for the nonthreat condition of the study were from the same video but did not include graphic depictions of death. The overall length of the video segments used for the two conditions were the same (approximately 7 minutes).

MEASURES

After receiving the personality feedback, and before the video, subjects were asked a series of questions regarding their reactions to the feedback. Following the video, subjects filled out the primary dependent measure, the A-State form of the State-Trait Anxiety Inventory (Spielberger, Gorsuch, & Lushene, 1970). Finally, following this

²We gave careful consideration to the ethical issues surrounding the use of this video as a threat induction and decided that it was acceptable for several reasons. First, the video from which we took our threatening excerpts is widely available in video stores and is very popular. At the time this study was conducted, one clerk told us that the video is rented almost every night. Second, none of the male subjects who participated in pilot sessions objected to being shown the video (nor did any of the subjects in the actual experimental sessions). Finally our consent statement informed subjects of exactly what the video would depict and that they were free to withdraw at any time.

anxiety measure, subjects filled out the Rosenberg Self-Esteem Scale (Rosenberg, 1965) as a check on the self-esteem manipulation.

Results and Discussion

Separate 2(threat) × 2(self-esteem) analyses of variance (ANOVAs) were conducted on each measure.

SELF-ESTEEM MANIPULATION CHECK *not a huge increase.*
 As expected, the ANOVA on the self-esteem measure revealed only a main effect of the self-esteem manipulation, $F(1, 48) = 4.20, p < .05$. Subjects in the increased-self-esteem condition exhibited higher self-esteem ($M = 33.04$) than those in the neutral self-esteem condition ($M = 30.73$), thus demonstrating that the personality feedback successfully manipulated self-esteem.

THE DEPENDENT MEASURE: ANXIETY

The ANOVA on the anxiety measure revealed the predicted Threat × Self-Esteem interaction, $F(1, 48) = 4.55, p < .04$. As the cell means in Table 1 suggest, pairwise comparisons revealed that anxiety was higher in the neutral self-esteem threat condition than in any of the other conditions (all $M > 2.10$, all $p < .05$); cell means for anxiety were virtually identical in the other three conditions (all $M < 1$). Thus, although the death video led to increased anxiety among neutral self-esteem subjects, it had no effect on increased-self-esteem subjects. In addition, increased-self-esteem subjects exhibited less anxiety in response to the film than did neutral self-esteem subjects.

SUBSIDIARY MEASURES

Following the personality feedback and before the video, subjects filled out a 15-item questionnaire concerning the feedback. Across all conditions, the

personality feedback was rated as describing subjects very well ($M = 7.47$, with 9 = *extremely well*). Four of the items that assessed subjects' perceptions of the accuracy and usefulness of the feedback were summed to form a composite measure of the perceived quality of the feedback. Four other items that assessed how much they liked and enjoyed reading their feedback were summed to form a composite measure of liking for the feedback. No effects were found on either of these composites (all $p > .10$). In debriefings it seemed that the subjects uniformly liked the feedback because it was so "accurate." One item assessed the extent to which the subjects felt self-confident; no effects were found on this item ($p > .10$). Six items concerned the extent to which the subjects were feeling negative emotions (disgusted, disturbed, anxious, angry, insecure, or fearful) and were summed to form a composite measure of negative affect. Only a main effect of self-esteem emerged on this composite, $F(1, 48) = 11.84, p < .001$. Increased-self-esteem subjects exhibited less negative affect than neutral self-esteem subjects (M s = 1.76 and 2.84, respectively, on a scale from 1 = *not at all* to 9 = *extremely*).

The results of Study 1 support the hypothesis that self-esteem reduces susceptibility to anxiety in response to threat. Although the death video led to a clear increase in anxiety in the neutral feedback condition, it had no effect whatsoever on the levels of anxiety exhibited by subjects whose self-esteem had been experimentally enhanced. Viewed differently increased self-esteem subjects showed less anxiety in response to threat than did neutral self-esteem subjects. This study provides the first direct evidence that self-esteem serves an anxiety-buffering function.

Study 2

Although the finding that increasing self-esteem reduces anxiety in response to death-related stimuli is consistent with terror management theory, the theory also posits that self-esteem provides protection from anxiety in response to other types of threat. According to the theory, people experience anxiety in response to two major types of threat: (a) direct threats to their physical well-being and continued existence and (b) threats to the psychological structures (i.e., self-esteem and worldview) that protect them from this basic anxiety. Beck,

TABLE 6.1. Mean Anxiety Scores for Interaction Between Mortality Salience and Level of Self-Esteem: Study 1

Personality feedback	Neutral	Positive
Neutral video	43.46	44.93
Death video	54.15	43.09

Note. Scores on the anxiety measure could range from 20 (low anxiety) to 80 (high anxiety).

Laude, and Bohnert's (1974) observation that anxiety reactions generally stem from threats to either one's physical well-being or one's social value is consistent with this proposition.

Study 2 was designed to assess the generality of the anxiety buffering effect of self-esteem to other types of threat by determining whether increasing self-esteem reduces anxiety in response to the threat of painful electric shocks. To provide converging evidence that self-esteem is indeed the conceptual variable affecting anxiety, we manipulated self-esteem with a different operationalization, specifically, feedback on a supposed test of verbal intelligence. Given the extent to which intelligence is valued in American culture, positive feedback concerning one's intelligence should increase self-esteem. To provide converging evidence that anxiety-proneness is indeed being affected by our self-esteem induction, we used a different measure of anxiety, physiological arousal (i.e., skin conductance) in response to threat. This measure also has the advantage of being less prone to reporting biases. We hypothesized that increasing self-esteem would reduce arousal in response to the threat of shock.

Method

SUBJECTS AND LABORATORY/FACILITIES

Forty-four male undergraduates volunteered to participate in return for course credit. Subjects were randomly assigned to conditions in a 2 (increased vs. neutral self-esteem) × 2 (threat vs. no threat) factorial design. Four subjects were subsequently excluded, 2 before assignment to conditions because we could not get stable physiological baseline measures and 2 because they expressed suspicion about the threat manipulation. Throughout the experiment, subjects were seated at a desk in a straight-backed chair in a sound-attenuated room. A control room directly adjoining the experimental room contained a Grass Instrument Company physiograph that was used to record subjects' skin resistance and a tape recorder that was used to administer experimental instructions.

PROCEDURE

On arriving for their individual sessions, subjects were given a brief tour of the control room, were shown the physiograph, and were told that we would be measuring skin resistance, which was

EXTRA in diff ROOM.
 > Reduces SSSU?

described as a measure of general physiological activity. Subjects were also shown the tape recorder and were informed that most of the instructions for the study would be recorded so that the experimenters could be in a different room while the physiological measures were being taken.

Subjects were then escorted into the adjacent room and read an informed-consent statement that described the study as concerned with the relationship between mood, cognitive and physical stimulation, and physiological responses. After signing the consent form, Beekman skin resistance electrodes were attached to the second and fourth fingers of the subjects' nondominant hand, and a dummy electric shock plate was attached to the subjects' nondominant wrist (to lend credence to the threat manipulation described later).

The experimenters returned to the control room and started the tape-recorded instructions, which reiterated the general purpose of the study and instructed the subject to sit back and rest for 5 minutes. This adaptation period enabled physiological responses to come to a resting level and stabilize. At the end of this period, subjects completed a self-report measure of anxiety that used adjectives from the Affect Adjective Check List (AACL; Zuckerman, 1960). For each adjective, subjects marked a 4-point scale (1 = *not at all* to 4 = *a great deal*) that reflected the degree to which that word described how they felt at that time. This measure has been used successfully in previous research (e.g., Bennett & Holmes, 1975).

After completing the anxiety measure, subjects were told that the cognitive stimulation we were studying would be provided by a version of the Thorndike Anagram Test, which was described as a highly accurate measure of verbal intelligence. The bogus test consisted of 20 anagrams that were designed such that the average subject would solve 16-18 problems correctly in the 5-minute period. Subjects were asked to take the anagram test while we ostensibly recorded their physiological responses. While subjects were taking the test, the experimenter randomly assigned them to either the neutral or increased self-esteem condition. After the test was completed, the experimenter returned to the room and told subjects in the neutral self-esteem condition that because we were primarily interested in physiological responses to taking the test rather than performance, we would not score or look at the test. Subjects assigned to the increased-self-esteem condition were told that we

→ Key Feature: Increased Esteem vs. Neutral Esteem

Don't Look at Lowered Esteem. Wonder why

→ What they call "Confrontation" is really Extension of anticipation, since nothing actually happens.
Why Do People Need Self-Esteem? ■ 111

were especially interested in how well people performed on the anagram test and that, consequently, the test would be scored, and they would receive feedback on their performance. The test was then scored by the experimenter, and subjects were told that they got N right (where N = the actual number of anagrams solved correctly), that no one in the experiment thus far had gotten more than $N - 2$ right, and that their score was in the 90th percentile.

The experimenters then returned to the control room and randomly assigned the subject to a physical stimulation condition. The tape then informed subjects that after the instructions were completed there would be a 90-second anticipation period during which a yellow light mounted in front of them would come on, at which time their physiological responses would be measured in the absence of physical stimulation.³ There would then be a 90-second experimental period during which a red light mounted in front of them would come on, at which time subjects would be exposed to physical stimulation while their physiological responses were recorded.

Subjects assigned to the threat condition were told that the physical stimulation would be provided by mildly painful electrical shocks administered randomly during the experimental period through the electrodes on their wrists. Subjects in the no threat condition were told that the physical stimulation would be provided by the light waves given off by the red light that would be turned on during that period. These subjects were informed that we were interested in how people respond to lights at different points of the color spectrum. The anticipation and experimental periods then occurred as described, except that no shocks were administered to any subjects. Following the experimental period, subjects completed a second AACL in which they were asked to describe how they felt during the experimental period. The session was then concluded, and subjects were thoroughly debriefed.

Results and Discussion

SKIN RESISTANCE⁴

Skin resistance was scored for seven 30-second periods. The first period was the last 30-seconds of the adaptation period that preceded any of the experimental manipulations. The highest skin resistance (lowest arousal) from this period was used

as an indication of subjects' initial level of arousal. The second, third, and fourth periods were the three 30-second periods within the 90-second anticipation period, and the fifth, sixth, and seventh periods were the three 30-second periods within the confrontation period. Skin resistance was scored during these periods by determining the lowest skin resistance (highest arousal). Skin resistance scores (in K-ohms) were then transformed to skin conductance scores (in siemens) using a reciprocal transformation as prescribed by Dawson, Schell, and Filion (1990; see this article for a discussion of the distinction between skin resistance and skin conductance, including a conceptual rationale for the use of conductance rather than resistance).

The logarithm of each skin conductance score was then computed to reduce skew and kurtosis (as recommended by Venables & Christie, 1990). Finally, the logarithm of skin conductance scores for 30-second periods within the anticipation and confrontation periods were averaged to obtain separate scores for anticipation and confrontation that were subsequently used as the primary dependent measures.⁵ To eliminate the influence of initial levels on subsequent arousal (i.e., "law of initial values," Lacey, 1956; Wilder, 1962) skin conductance scores during the adaptation period were used as a covariate for the major analyses.⁶

³The inclusion of an anticipation period before the experimental period permitted an evaluation of subjects' responses during different phases of the coping process during which there may be important differences (Lazarus, 1966).

⁴We chose to measure skin resistance because electrodermal activity is known to be related to anxiety (see Dawson et al., 1990, for a review of this literature) and is commonly used as an indication of anxiety in contemporary social psychophysiological research. In addition, pilot testing indicated that our threat manipulation produced decreases in skin resistance (increased arousal) and would thus allow us to assess the hypothesis that self-esteem enhancement would attenuate this effect. We also measured heart rate at that time but did not obtain an effect for the threat manipulation.

⁵Initial analyses in which the three 30-second segments of each period were included in the ANCOVA revealed no effects involving either factor. Consequently, skin resistance scores for these periods were averaged to obtain one score for each period.

⁶The assumption of homogeneity of regression slopes necessary for analysis of covariance (ANCOVA) was met for this analysis as well as for the ANCOVAs conducted for Study 3. In addition, in both studies, there were no premanipulation differences on the covariates, and the covariates were significant in the ANCOVAs (all p s < .05). For the sake of brevity and simplicity of presentation, only adjusted means are reported for the ANCOVAs.

Use adaptation phase as covariate to control for variation in initial level of arousal

Compare lowest arousal at rest
vs. highest arousal at rest.

A 2(self-esteem) × 2(threat) × 2(time: anticipation vs. confrontation) analysis of covariance (ANCOVA) performed on the transformed skin conductance scores, using the adaptation period score as a covariate, revealed a main effect for threat, $F(1, 35) = 11.56, p < .002$; a marginal main effect for self-esteem, $F(1, 35) = 3.43, p < .07$; a main effect for time, $F(1, 36) = 6.59, p < .01$; and a significant Self-Esteem × Threat × Time interaction, $F(1, 36) = 5.48, p < .02$. The main effect for threat resulted from threat subjects being generally more aroused than no threat subjects ($M_s = 1.3290$ vs. 1.2253); this suggests that the threat manipulation successfully produced differential levels of arousal. The marginal main effect for self-esteem reflects the fact that increased self-esteem subjects were generally less aroused than neutral self-esteem subjects ($M_s = 1.2471$ vs. 1.3042). The main effect for time reflects the fact that subjects were more aroused during the confrontation period than during the anticipation period ($M_s = 1.2800$ vs. 1.2706). Mean skin conductance scores for each condition are presented in Table 6.2.

Pairwise comparisons conducted to explicate the nature of the Self-Esteem × Threat × Time interaction revealed that the predicted pattern of lower arousal in response to threat of shock among increased self-esteem subjects than among neutral self-esteem subjects emerged in both the anticipation and confrontation periods but was stronger in the confrontation period. Specifically, during the anticipation period, increased self-esteem threat subjects were marginally less aroused than neutral self-esteem threat subjects, $t(17) = 1.81, p < .10$. During the confrontation period, increased self-esteem threat subjects were significantly less aroused than neutral self-esteem threat subjects, $t(17) = 2.38, p < .05$.

In addition, in the anticipation period, neutral self-esteem threat subjects were significantly more aroused than neutral self-esteem no threat subjects, $t(19) = 3.17, p < .01$, whereas increased-self-esteem threat subjects were only marginally more aroused than their nonthreatened counterparts, $t(17) = 1.81, p < .10$. During the confrontation period, neutral self-esteem threat subjects were significantly more aroused than neutral self-esteem no threat subjects, $t(19) = 3.60, p < .002$, whereas there was no difference in arousal in the increased self-esteem condition between threat and no threat subjects, $t(17) = 1.31, ns$. These results indicate that increasing self-esteem reduced physiological

TABLE 6.2. Adjusted Cell Means for the Three-Way Interaction of Self-Esteem, Threat, and Time on Transformed Skin Conductance Scores: Study 2

Measure	Anticipation		Confrontation	
	SE raised	SE neutral	SE raised	SE neutral
Threat	1.2813	1.3606	1.2800	1.3846
No threat	1.2052	1.2343	1.2220	1.2375

Note. Cell means are logarithms of skin conductance scores in siemens. A higher number is indicative of higher arousal. SE = self-esteem.

arousal in response to a threatening event and that this effect was more pronounced during the confrontation period than the anticipation period.

SELF-REPORTED AFFECT

A 2(self-esteem) × 2(threat) ANCOVA was performed on the self-report anxiety measure, using the score from the adaptation period as a covariate. Mean self-reported anxiety scores for each condition are presented in Table 6.3. This analysis revealed only a main effect for threat, $F(1, 35) = 18.24, p < .0001$. Subjects in the threat condition reported higher anxiety than subjects in the no threat condition ($M_s 16.1$ vs. 7.09 , respectively). This suggests that the threat manipulation successfully produced different levels of self-reported anxiety. Although the individual cell means are clearly in the predicted direction (i.e., increased self-esteem threat subjects tended to report less anxiety than neutral self-esteem threat subjects), the interaction was not statistically significant.

In sum, the physiological data from Study 2 suggest that the anxiety-buffering effect of self-esteem observed in Study 1 extends to measures of physiological arousal and generalizes to threats not explicitly linked to death. Increased self-esteem subjects exhibited less arousal in response to threat of shock than neutral self-esteem subjects, particularly during the period when shocks were actually expected. Furthermore, whereas the threat of shock led to clear increases in arousal in the neutral self-esteem condition, it had less effect on arousal among subjects in the increased-self-esteem condition. The boost to self-esteem apparently reduced subjects' susceptibility to anxiety in response to the threat of electric shock. Whereas Study 1 demonstrated the anxiety-buffering effect on reports of anxiety in response to death-related stimuli, the present study demon-

Look how small that diff are!

strated a parallel effect of a different self-esteem manipulation on physiological arousal in response to a different type of threat, thus providing converging evidence for the anxiety-buffer hypothesis.

Although the means on the self-report measure of anxiety in Study 2 were in the predicted direction, the lack of a reliable effect on that measure is puzzling. Perhaps the retrospective nature of the measure reduced its sensitivity; the measure came after the threat of shock was over. Alternatively, it may be that subjects threatened with electric shocks that have been described as painful feel some demand to report anxiety.

Although these two studies show that increasing self-esteem can reduce anxiety in response to threat, there is a plausible alternative explanation for these results. Perhaps positive affect engendered by the self-esteem boost rather than self-esteem per se provides the protection against anxiety. We think this is unlikely because recent research suggests that positive and negative affective states are largely independent of each other (e.g., Watson, Clark, & Tellegen, 1988). Thus, even if the positive feedback created positive affect, it is not clear why that would inhibit anxiety in response to subsequent threat. Nevertheless, the possible role of positive affect in mediating the effects of the self-esteem manipulation is examined in Study 3.

Study 3

Study 3 was designed to provide further evidence concerning the anxiety-buffering effect of self-esteem and to assess the possible role of positive affect in mediating this effect. To this end, the basic design of Study 2 was replicated and the self-report anxiety measure was replaced with the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988). To assess the generality of the effect on physiological arousal demonstrated in Study 2, we returned to the personality feedback manipulation of self-esteem that was effective in Study 1. Other than that, the design of Study 3 was essentially the same as Study 2. We hypothesized that increasing self-esteem by using positive personality feedback would reduce arousal in response to the threat of shock and that this reduction in arousal would not covary with any effect the personality feedback might have on positive affect.

Method

SUBJECTS AND LABORATORY FACILITIES

Fifty male undergraduates participated individually as part of a research requirement. All subjects had previously participated in a mass testing session in which they completed a variety of personality assessments, the results of which supposedly provided the basis for the personality profiles used to manipulate self-esteem. Subjects were randomly assigned to conditions in a 2 (increased vs. neutral self-esteem) × 2 (threat vs. no threat) factorial design. Three subjects were excluded from data analyses because of suspicion. Laboratory facilities and equipment were the same as in Study 2.

PROCEDURE

Procedures were the same as in Study 2, with the following exceptions:

1. At the conclusion of the 5-minute adaptation period, during which baseline levels of arousal were recorded, subjects completed an initial PANAS, which served as the baseline measure of affect.
2. Self-esteem was manipulated with the same personality feedback that was used in Study 1 rather than the feedback on the bogus intelligence test used in Study 2. Subjects were randomly assigned to receive either positive or neutral feedback supposedly based on a set of personality tests they had taken during a mass testing session. This feedback was given after subjects completed the initial PANAS.
3. The procedures used for the threat manipulation were identical to those used in Study 2, including the assessment of arousal during separate anticipation and confrontation periods, with two exceptions. Because we did not want suspicions aroused by the absence of actual

TABLE 6.3. Adjusted Means for the Self-Report Anxiety Measure: Study 2

Measure	Self-esteem	
	Increased	Neutral
Threat	13.40	18.16
No threat	6.30	7.81

Note. A higher number is indicative of higher anxiety.

PO affect

PANAS

Not 5.54
d.f.

shocks during the confrontation period, threat subjects were told they would receive between zero and six shocks on a random basis. In addition, the anticipation and confrontation periods were shortened to 60 seconds each. After the confrontation period, subjects filled out a second PANAS, which enabled us to assess possible effects of the self-esteem and threat manipulations on positive and negative affect and the likelihood that the effects on arousal could have been mediated by positive affect.

4. After finishing the second PANAS, subjects completed a final questionnaire containing manipulation checks and probes for suspicion. To check on the self-esteem manipulation, subjects were asked to report on 9-point scales how well the personality feedback described them (1 = *not at all* to 9 = *completely*) and how good the personality feedback made them feel about themselves (1 = *very good* to 9 = *very bad*). After completing this questionnaire, subjects were thoroughly debriefed and dismissed.

Results and Discussion

MANIPULATION CHECKS

Individual 2(self-esteem) \times 2(threat) ANOVAs were conducted on responses to the self-esteem manipulation check questions. On the question regarding how well the personality feedback described them, subjects rated the personality feedback as describing them very well (grand $M = 7.21$), with no differences across conditions (all p 's $> .25$). The ANOVA on the question about how good the feedback made subjects feel about themselves produced main effects for self-esteem, $F(1, 43) = 17.13, p < .0002$, and threat, $F(1, 43) = 4.30, p < .05$. Specifically, increased-self-esteem subjects reported that the personality feedback made them feel better about themselves than did neutral self-esteem subjects (M s = 2.83 and 4.48, respectively); lower values indicate better feelings, and no threat subjects reported that the personality feedback made them feel better about themselves than did threat subjects (M s = 3.25 and 4.0, respectively). This latter effect was most likely due to the measure being taken after the threat manipulation. Consistent with this notion, there was no hint of an interaction between self-esteem and threat, $F(1, 43) = .13$. These findings suggest that self-esteem was again successfully manipulated.

SKIN CONDUCTANCE

Procedures for scoring, transforming to conductance, and analyzing skin resistance were identical to those used in Study 2. A 2(self-esteem) \times 2(threat) \times 2(time) ANCOVA performed on transformed skin conductance scores, using adaptation period scores as a covariate, produced main effects for threat, $F(1, 43) = 5.00, p < .03$, self-esteem, $F(1, 43) = 4.27, p < .05$, and time, $F(1, 43) = 9.90, p < .005$; a Threat \times Time interaction, $F(1, 43) = 12.06, p < .001$; and the predicted Self-Esteem \times Threat interaction, $F(1, 43) = 8.59, p < .006$. The main effect for threat reflects the fact that the threat manipulation successfully produced more arousal among threatened than nonthreatened subjects (M s = 1.3270 and 1.2126, respectively; higher values indicate greater arousal). The main effect for self-esteem indicates that increased self-esteem subjects were less aroused than neutral self-esteem subjects (M s = 1.2118 and 1.3266, respectively). The main effect for time was due to subjects being more aroused during confrontation than during anticipation (M s = 1.2882 and 1.2578, respectively). The Threat \times Time interaction reflects the fact that there was no increase in arousal over time for no threat subjects (M s of 1.2082 and 1.2050, respectively) but a significant increase in arousal between anticipation and confrontation periods for threat subjects (M s = 1.3070 and 1.3713, respectively), $t(22) = 6.25, p < .001$.

Of most relevance to present concerns, mean skin conductance scores for the Self-Esteem \times Threat interaction are presented in Table 6.4. Pairwise comparisons revealed that, as predicted, among threatened subjects, those in the increased-self-esteem condition were significantly less aroused than those in the neutral self-esteem condition, $t(22) = 3.49, p < .01$. Also as predicted, whereas threatened neutral self-esteem subjects exhibited significantly greater arousal than

TABLE 6.4. Adjusted Cell Means for the Two-Way Interaction of Self-Esteem and Threat on Transformed Skin Conductance Scores: Study 3

Measure	Self-esteem	
	Increased	Neutral
Threat	1.1932	1.4851
No threat	1.2319	1.1813

Note. Cell means are logarithms of skin conductance scores in siemens. A higher number is indicative of higher anxiety.

nonthreatened neutral self-esteem subjects, $t(21) = 3.57, p < .01$, no difference in arousal as a function of threat was found in the increased self-esteem condition ($t < 1$). Unlike Study 2, this effect was consistent across the anticipation and confrontation periods; time did not moderate the interaction of self-esteem and threat.

SELF-REPORTED AFFECT

Separate 2(self-esteem) \times 2(threat) ANCOVAs were performed on the Positive and Negative Affect subscales from the PANAS, using the appropriate subscale score from the adaptation period as a covariate. No effects of any kind were found on either subscale (p s $> .20$). To assess whether some effect of the manipulations on anxiety could be detected, we formed a scale using the three items from the Negative Affect subscale of the PANAS that are identical to items from the A-State form of the State-Trait Anxiety Inventory (Spielberger et al., 1970; nervous, upset, and jittery). We then conducted an ANCOVA on this crude measure of anxiety using a composite measure of the same items from the baseline PANAS as covariate, which produced only a main effect for threat, $F(1, 42) = 4.18, p < .05$. As in Study 2, subjects in the threat condition reported higher levels of anxiety on this measure than subjects in the control condition, (M s = 2.01 and 1.78, respectively) indicating that the threat manipulation was successful. As in Study 2, the self-esteem manipulation did not moderate this effect on self-reported anxiety.

ASSESSING THE POSITIVE AFFECT ALTERNATIVE

The fact that the manipulation did not seem to be confounded with positive affect casts doubt on positive affect as an explanation for the moderating effect of the self-esteem manipulation on arousal. We also conducted a multiple regression analysis with arousal as the dependent variable, entering the premeasure and postmeasure of positive affect before the baseline, main effect, and interaction terms. Neither positive affect measure contributed significantly to the equation (both F s < 1). As in the ANCOVA, the predicted interaction term still contributed significantly $F(1, 41) = 6.02, p < .025$. Thus, there was no indication that the interaction resulted from an effect of the manipulation on positive affect.

In sum, the findings of Study 3 replicate those

of Study 2 in showing that the anxiety-buffering effect of self-esteem generalizes to threats not explicitly linked to death. Whereas the threat of painful electric shock led to clear increases in arousal in the neutral self-esteem condition, it had no effect on arousal among subjects in the increased-self-esteem condition. Thus, the boost to self-esteem reduced subjects' susceptibility to anxiety in response to the threat of electric shock.

The findings of Study 3 are also consistent with those of Study 2 in demonstrating an effect of increased self-esteem on physiological arousal in response to threat of shock in the absence of a parallel effect on self-reported anxiety-related items. Although the absence of parallel effects on self-reports are somewhat puzzling, the fact that reliable effects on self-reported anxiety were found in Study 1 suggests that self-esteem inductions can affect both types of measures. Perhaps the difference in threat manipulations between Study 1 and Studies 2 and 3 might account for the different effects on self-report. As noted earlier with regard to Study 2, subjects may have felt a demand to report symptoms of anxiety when threatened with shock. In addition, in both shock studies, because we did not want the self-report measures to interfere with our physiological readings, the self-report measures came after the threat of shock was over, rendering the measures retrospective and perhaps insensitive to an effect of the earlier self-esteem manipulation in the threat condition.

General Discussion

The three studies reported in this article provide converging support for the proposition that self-esteem provides a buffer against anxiety. Study 1 demonstrated that a boost to self-esteem makes subjects less prone to experience anxiety in response to threatening images of death; in fact, although control subjects reported significantly more anxiety in response to the threatening than neutral video increased-self-esteem subjects' levels of anxiety were unaffected by this presentation. Studies 2 and 3 demonstrated that the anxiety-buffering effect of self-esteem extends to events not directly associated with death and can be detected with a physiological indicator of anxiety. In these studies, increased-self-esteem subjects exhibited less arousal in response to the threat of electric shock than did control subjects.

These findings are generally consistent with those of previous studies that have shown self-esteem to be negatively correlated with anxiety and other signs of psychological and physical distress. They are also consistent with the experimental literature that has shown threats to self-esteem produce anxiety, that this anxiety motivates defense of self-esteem, and that defensive maneuvers reduce anxiety resulting from such threats. The present findings go beyond those of previous studies by demonstrating a causal relationship between self-esteem and anxiety.

From the perspective of terror management theory, all of the previous findings can be explained by positing an anxiety-buffering function for self-esteem. The present research provides direct support for this proposition by showing that increasing self-esteem reduces self-reported anxiety in response to death images and physiological arousal in response to the threat of pain. Although when taken individually each study has limitations, by using two operationalizations of self-esteem and finding effects on two indicators of anxiety, the present research provides converging support for the anxiety-buffer proposition.⁷ [. . .]

Conclusion

In our view, the most compelling explanation for the present set of findings is that self-esteem—the feeling that one is valuable—provides protection against anxiety in response to threat. From the perspective of terror management theory, this feeling of personal value reduces one's susceptibility to anxiety because of the primitive affective and cognitive linkages between valued behavior and parental protection that are reinforced throughout one's life by cultural institutions and teachings. Clearly, all aspects of terror management theory cannot be unequivocally confirmed or disconfirmed by any single study or small set of studies. The theory is very broad and can be used to deduce hypotheses about a wide variety of psychological phenomena. The studies presented were focused exclusively on our analysis of the

⁷It should be noted that the anxiety-buffer proposition could be derived from other theoretical perspectives that share some commonalities with terror management theory, such as Bowlby's (1969), Sullivan's (1953), and Horney's (1937).

anxiety-buffering function posited for the self-esteem motive; they do not bear on a variety of other propositions and hypotheses that can be derived from the theory (some of which have been assessed by the research cited earlier).

Although these studies support one of the theory's most central propositions, their most important contribution may be that they raise a variety of intriguing questions for future inquiry. For example, it will be important to explore the precise processes through which self-esteem acquires and produces its anxiety-buffering effects. In addition, further inquiry should be directed toward investigating the types of anxiety-producing events for which self-esteem provides protection.

Because the need for self-esteem is usually taken as a fundamental, irreducible psychological need, or, more commonly, as an unexplained postulate, there has been little, if any, discussion of why the need exists or what functions self-esteem might serve for the individual. Although it might be possible to derive functions for this widely recognized need from other theoretical orientations, empirically oriented social scientists have rarely attempted to do so. This is unfortunate because the answer to a question as basic as this is bound to have profound implications for understanding human nature.

The idea that self-esteem is primarily a defensive structure has implications for any theory that posits the need for self-esteem as a central explanatory process. If self-esteem is primarily a means of insulating oneself from one's deeply rooted fears, the whole concept of a self-esteem motive must be viewed in a very different light. Conceptualizing the pursuit of personal value as a defensive avoidance of basic human fears draws one to consider the possibility of alternative means of serving this superordinate function. Although such a defensive conception of self-esteem may at first glance seem to be an unpleasant way of thinking about the human condition, it may ultimately have the liberating quality of leading to the consideration of alternative means of addressing our most basic human problems.

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