
The Effects of Self-Esteem and Ego Threat on Interpersonal Appraisals of Men and Women: A Naturalistic Study

Kathleen D. Vohs

University of British Columbia

Todd F. Heatherton

Dartmouth College

A naturalistic study examined the effects of self-esteem and threats to the self on interpersonal appraisals. Self-esteem scores, ego threat (operationalized as a substantial decrease in self-esteem across an average of 9 months), and their interaction were used to predict likability and personality perceptions of college men and women. The results revealed a curvilinear function explaining likability: Moderate to low self-esteem men and women were higher in likability when threatened, whereas high self-esteem men were seen as less likable when threatened. Personality ratings indicated that high self-esteem men and women who were threatened were rated highest on Antagonism (i.e., fake, arrogant, unfriendly, rude, and uncooperative). Mediation analyses revealed that differences in Antagonism statistically accounted for differences in likability. These patterns are interpreted with respect to gender and time in interpersonal perceptions as well as naturalistic versus laboratory investigations.

Keywords: *self-esteem; interpersonal appraisals; ego threat; gender; naturalistic investigations*

Humans are social beings, and thus having successful interpersonal relationships is a crucial aspect of life. Feeling good about oneself and having high esteem are also important to most people, especially people who were raised in Western cultures (Heine, Lehman, Markus, & Kitayama, 1999). However, evidence is beginning to accumulate that these two motives may be in conflict at times. Indeed, high self-esteem may sometimes be disadvantageous to interpersonal perceptions and relationships (Baumeister, Smart, & Boden, 1996; Heatherton & Vohs, 2000; Vohs & Heatherton, 2001, 2002; also see Baumeister, Campbell, Krueger, & Vohs, 2003). Previous research has demonstrated that following a threat

to the self, people with high self-esteem are seen as less likable by an interaction partner, whereas those with low self-esteem are seen as more likable (Heatherton & Vohs, 2000; Vohs & Heatherton, 2001, 2002). This article uses a large-scale naturalistic study to assess the influence of self-esteem and ego threat on interpersonal appraisals of both men and women outside of the laboratory.

A review of the literature on the effects of ego threat and self-esteem revealed that most of the available evidence has largely been conducted in the laboratory using male participants (Baumeister, Heatherton, & Tice, 1993; Colvin, Block, & Funder, 1995; McFarlin, Baumeister, & Blascovich, 1984; Schneider & Turkat, 1975). Accordingly, in a previous investigation, we conducted a laboratory study of the interactive effects of self-esteem and ego threat on likability and personality perceptions among female dyads (Vohs & Heatherton, 2002). The results of this study replicated past experiments using male dyads: We found that after high self-esteem women receive a threat to the self, they are seen as less likable and more Antagonistic, a personality factor that consists of the traits arrogant, rude, fake, unfriendly, and uncooperative. Conversely, after low self-esteem women receive a threat to the self, they are seen as more likable. Although we have now found this same pattern

Authors' Note: This research was supported in part by National Institute of Mental Health Grants MH12794 (KV) and MH59282 (TH). Please address correspondence to Kathleen Vohs, University of British Columbia, Sauder School of Business, Marketing Division, 661-2053 Main Mall, Vancouver, BC, Canada, V6T 1Z2; e-mail: vohs@sauder.ubc.ca.

PSPB, Vol. 29 No. 11, November 2003 1407-1420

DOI: 10.1177/0146167203255767

© 2003 by the Society for Personality and Social Psychology, Inc.

in several independent investigations, it is necessary to assess whether the results generalize outside of the laboratory.

LABORATORY VERSUS NATURALISTIC INVESTIGATIONS

One factor that differs greatly when assessing interpersonal perceptions in a laboratory versus naturalistic settings is length of acquaintance. Laboratory research typically involves short-lived interactions of approximately 10 to 20 min; however, it is plausible that interpersonal perceptions would differ among people who have more experience with each other. Given that interpersonal judgments become modified over time to take into account new information (Sherman & Klein, 1994), perceptions of high and low self-esteem people may change as a function of time. For instance, people change their self-presentations depending on the nature of the relationship with their interaction partners. Interactions among friends constrain self-enhancement behaviors due to shared knowledge of abilities and past experiences and an awareness that future interactions may disprove grandiose claims (Baumeister, 1982; Schlenker & Leary, 1982). Accordingly, people tend to portray themselves modestly with friends but enhancingly with strangers (Tice, Butler, Muraven, & Stillwell, 1995). People may be more enhancing with strangers in part because they want to present their best side to a new perceiver. Indeed, results of a meta-analysis show that self-presentation has a sizable impact on others' evaluations (Gordon, 1996). Thus, interpersonal perceptions gleaned from a brief interaction between two people who are newly acquainted may differ greatly from interpersonal perceptions that accumulate within the context of an ongoing relationship.

In support of this suggestion, research on liking for one's roommate indicates that low self-esteem people may behave in an unlikable manner in relationships of several months duration. Research by Joiner and colleagues (Joiner, Alfano, & Metalsky, 1992, 1993) has demonstrated that low self-esteem men—but not low self-esteem women—who showed symptoms of mild depression tend to engage in reassurance and negative-feedback-seeking behaviors that paradoxically lead to decreased liking and subsequent rejection by their roommates. Thus, whereas people with low self-esteem may be likable in the laboratory over short periods of time, it is possible that they would be less likable over longer time periods.

Research also suggests that perceptions of high self-esteem people may change with time. A study of the effects of self-enhancement showed that its effects on interpersonal perceptions varied greatly within a 2-month span (Paulhus, 1998). Self-enhancement—a con-

struct that was moderately correlated with global self-esteem ($r = .41$)—predicted favorable interpersonal ratings after an initial 20-min meeting, but by the end of seven weekly interactions, self-enhancement predicted negative interpersonal ratings.

Similarly, a recent study of roommate liking found that men—but not women—who exhibited defensive self-enhancement were increasingly disliked by roommates across a span of several weeks (magnitude of change was approximately two thirds of a standard deviation). Conversely, men who did not display defensive self-enhancement were increasingly liked (Joiner, Vohs, Katz, Kwon, & Kline, 2003). These data highlight the possibility that the nature of interpersonal perceptions can change drastically over time.

In contrast, however, a different study of self-enhancers (Colvin et al., 1995) found rather stable perceptions of men and women across several time periods. Ratings by friends (Study 2) and outside judges (Study 1), as well as observations obtained within the context of a social interaction (Study 3), indicate that the behaviors of self-enhancers are consistently aversive and that they are viewed negatively by others. Hence, Colvin et al.'s results suggest a convergence in interpersonal perceptions between short- and long-term interactions.

In summary, there are differential predictions regarding the similarity between patterns of likability and personality perceptions found in short-term interactions in the laboratory and those found among people with a longer interpersonal history. Some evidence suggests that time plays a considerable role in determining interpersonal perceptions (e.g., Joiner et al., 1992, 1993; Paulhus, 1998), whereas other evidence suggests consistency in the perceptions of others across relationships of varying lengths (Colvin et al., 1995). We suggest that an important variable to consider is the role of threat, which may serve to equalize interpersonal perceptions across time, a factor that we consider next more in-depth. Although perceptions of people may change with differing levels of acquaintance and setting (e.g., naturalistic vs. laboratory studies), the presence of a threat may produce a consistent intrapsychic effect within the individual so as to render interpersonal perceptions under threat more similar across settings, relationships, and circumstances.

ADDITIONAL CONSIDERATIONS

Another notable feature of the aforementioned studies is that many of them concern defending the self (i.e., Colvin et al., 1995; Joiner et al., 1992, 1993, 2003). Thus, although differences in the length of time of acquaintance may change the effect of self-esteem on interpersonal perceptions, another important consideration is

the nature of events that occur during a given time period. Events that engender feelings of threat or defensiveness are likely to be important determinants of interpersonal perceptions. In our earlier studies, we found no differences in the likability and personality ratings of high and low self-esteem people under neutral (i.e., nonthreatening) conditions. After threat, however, the beneficial (for low self-esteem people) or detrimental (for high self-esteem people) effects of self-esteem emerged. In the current study, we examined a naturally occurring threat in the real world, namely, a substantial drop in self-esteem following matriculation at a competitive college, an operationalization that allowed us to test the interactive effects of self-esteem and ego threat on interpersonal perceptions.

Research by Colvin and colleagues (1995) and Joiner and colleagues (1992, 1993, 2003) also raises the possibility that gender may play an important role in others' impressions of high and low self-esteem people. As noted, Joiner et al. (1992, 1993) found that men with depressive tendencies and who engaged in reassurance-seeking were disliked by their roommates, an effect that did not occur among women with the same characteristics and behaviors. More recently, Joiner et al. (2003) reported that men increasingly disliked their same-sex roommates who engaged in defensive self-enhancement, an effect that did not occur among female roommate pairs. In addition, although Colvin et al. found that all self-enhancers were perceived negatively, he noted that the social styles of self-enhancers differed by gender. Indeed, Colvin et al. speculated that men and women may have different goals for self-enhancement, with men self-enhancing to impress others and women self-enhancing to affect the self. Despite previous work in the laboratory showing similar patterns of likability and personality traits for men versus women as a function of self-esteem and ego threat (Vohs & Heatherton, 2002), there is nonetheless some extant suggestion of possible gender differences. Thus, we examined the potential that threat differentially influences perceptions of men and women in naturalistic settings.

The summation of findings from studies on people with highly favorable or unfavorable self-views suggests that people most like those whose self-presentations are neither overly self-enhancing nor overly self-denigrating (Colvin et al., 1995; Joiner et al., 1992, 1993; see also Robinson, Johnson, & Shields, 1995). Hence, it is possible that the relationship between self-esteem and likability is curvilinear, such that greatest liking occurs for those who have moderate levels of self-esteem and that people with very low and very high self-esteem are actually not well liked (see Joiner et al., 1992; Paulhus, 1998). It therefore seemed desirable to test for nonlinear effects of self-esteem on likability and personality perceptions.

THE CURRENT STUDY

For the current experiment, we used data obtained as part of a large study that examined changes in lifestyle patterns from high school to college. This study obtained self-esteem scores for more than 90% of incoming first-year students at Dartmouth College prior to their arrival on campus (data were obtained while participants were still in their senior year of high school). During their first year at college, more than two thirds of these participants then completed a second measure of self-esteem.

It is likely that attending a selective Ivy League college is threatening for some students, given that these students were "big fish" in high school who were then thrust into a small pond filled with other big fish (Marsh & Parker, 1984). The move from high school to college represents a transition period in which young adults' self-concepts may fluctuate and change (see Vohs, Heatherton, & Herrin, 2001), thereby allowing us to test the effects of naturalistic changes in self-esteem on interpersonal evaluations. In this study, we operationalize ego threat as a substantial drop in self-esteem from high school to college.

Dartmouth College is a relatively small and cohesive university in which students form a strong cohort allegiance and get to know many members of their class. We took advantage of this setting to recruit members of one academic class to make sociometric analyses of their classmates. We followed the method of Lott, Lott, Reed, and Crow (1970), who asked participants to select classmates they knew and liked, knew and disliked, and those with whom they were not well acquainted. This method was used to gain a wide range of sociometric ratings.

In the current study, we compared likability and personality traits of participants who experienced a natural drop in self-esteem (i.e., who were ego threatened) to those who did not experience such self-esteem changes (i.e., who were nonthreatened). Based on the results from previous laboratory studies, we predicted that high self-esteem people who were threatened would be rated as less likable and more Antagonistic than people who were not threatened. We also predicted that threat would lead low self-esteem people to be seen as more likable than those who were not threatened.

Method

PARTICIPANTS

One hundred thirty-three undergraduates (62 men and 71 women) served as participant raters. In exchange for their participation, participants' names were entered in a drawing for \$350.

PROCEDURE

In the spring of their senior year of high school, students who were the incoming class of Dartmouth College were sent a packet of questionnaires regarding self-esteem, attitudes, relationships, and health patterns; 925 of 1,029 (90%) incoming students completed the questionnaire. We refer to assessments during high school as Time 1 measurements.

At one of three times during their first year of college, these students were asked to complete a second questionnaire similar to the first (see Vohs et al., 2001, for more details). A total of 607 (66% of Time 1 participants) students completed this second questionnaire. We refer to assessments during the first year of college as Time 2 measurements. These questionnaires were part of a larger study on changes in eating habits and dieting patterns after arrival at college (see Vohs et al., 2001). One section of the questionnaire included a measure of self-esteem, which was a modified version of the State Self-Esteem Scale (SSES) (Heatherton & Polivy, 1991). The SSES is a reliable 20-item scale that asks the respondent to rate himself or herself on a 5-point scale (where 1 = *not at all*, 5 = *very often*). Participants were asked to respond in terms of how they have felt “during the past week,” and the total score represented participants’ self-esteem in the current study. Students gave informed consent to have their data be used for different psychological studies, contingent on their responses being confidential.

We randomly contacted 150 raters for the current study. Participant raters arrived individually to the lab and were told that the study investigated the role of person perception in likability. Using the methods of Lott et al. (1970), raters were asked to select and rate three classmates they knew well and liked, three classmates they knew well and disliked, and three classmates with whom they were not well acquainted. Order of description instruction was counterbalanced across raters. Participants rated each of the nine targets on 22 personality characteristics and their liking for the target. Trait measurements were made using a bipolar ratings scale, in which each term was anchored by two adjectives that raters used to rate the extent to which the characteristics described the target on a 7-point scale (e.g., 1 = *unintelligent*, 7 = *intelligent*). At the end of the questionnaire, raters were asked to indicate how much they like the target (1 = *not at all*, 7 = *very much*) and how well they know the target, also using a 7-point scale. To later associate these peer ratings with targets’ self-esteem, raters were asked to include the names of the targets they rated. Raters were assured of the confidentiality of their responses with the knowledge that only members of the lab would have access to the data and targets of evaluation would not know they had been rated.

We then returned to the original large survey to obtain targets’ self-esteem scores. To assign ego threat status to each target, we needed to have access to both Time 1 and Time 2 measures of self-esteem. Thus, the current study includes only those targets for whom we had data from both surveys (i.e., both high school and college responses). We had a total sample of 607 targets for whom we had Time 1 and Time 2 self-esteem. Because some targets were rated more than once by their peers, we randomly selected one rating for each target to minimize nonindependence of observations. This selection process resulted in a data set composed of 372 unique target ratings (216 women and 156 men). In terms of the conditions under which targets in this data set were rated by their peers, 145 target ratings came from the “like” category, 99 ratings came from the “dislike” category, and 128 ratings came from the “only slightly acquainted” category (see above and Lott et al., 1970).¹

Results

PRELIMINARY ANALYSES

In the context of a laboratory experiment, the validation of an ego threat manipulation would be assessed by comparing the self-esteem scores of participants who received an ego threat versus participants who did not (e.g., Baumeister et al., 1993; Heatherton & Vohs, 2000; Vohs & Heatherton, 2001). Theoretically consistent with this conceptualization, we operationalized ego threat in the current study as a substantial decrease in self-esteem within participants from high school to college. To do so, we subtracted self-esteem scores obtained in high school from scores obtained in college and labeled participants as ego threatened if they experienced a self-esteem drop of 10 points or greater. A decrease of 10 points or more was chosen because (a) it represents approximately one standard deviation of self-esteem scores at Time 1, a considerable decrease in self-esteem; (b) we aimed to circumvent the possibility that smaller fluctuations in self-esteem were due to regression to the mean; and (c) one standard deviation drop in self-esteem is the typical effect of laboratory manipulations of ego threat on self-esteem (Heatherton & Vohs, 2000; Vohs & Heatherton, 2001). Participants who did not meet the criterion of a 10-point or greater drop in self-esteem were considered not threatened. Using this categorization, 102 targets were classified as ego threatened and 270 were classified as nonthreatened.

Overall, there was a significant drop in self-esteem from Time 1 ($M = 77.62$, $SD = 10.87$) to Time 2 ($M = 71.24$, $SD = 13.69$), $F(1, 369) = 162.67$, $p < .0001$, supporting our contention that changes in self-esteem score did not reflect simple regression to the mean. In addition, initial self-esteem score was not significantly associated

with a drop in self-esteem from Time 1 to Time 2, which suggests that people of all self-esteem levels were equally likely to have suffered (or not) a decrease in self-esteem.² In terms of components of self-esteem, most of the change occurred on the performance self-esteem factor, $F(1, 369) = 447.78, p < .00001$ (M Time 1 = 30.53, M Time 2 = 25.21); physical appearance self-esteem showed a modest decrease, $F(1, 370) = 61.29, p < .0001$ (M Time 1 = 22.13, M Time 2 = 20.52); and, interestingly, social self-esteem showed a very slight increase, $F(1, 369) = 6.83, p = .01$ (M Time 1 = 24.89, M Time 2 = 25.54).

ANALYTIC NOTES

We predicted that likability would be a function of the combination of ego threat status and self-esteem. We tested this hypothesis by conducting a hierarchical regression model (see Cohen & Cohen, 1983) to predict liking for the target. Consistent with recommendations from Aiken and West (1991), all first-order variables were centered prior to entering the regression model. We also note that the first variable entered at Step 1 in all regression models was ratings of acquaintance. Given that amount of exposure to the targets varied and given that length of acquaintance affects congruence in personality ratings (Funder & Colvin, 1988; Norman & Goldberg, 1966), we forced ratings of acquaintance into the model to better assess likability, independent of familiarity.³

RATINGS OF LIKABILITY

We constructed the following regression model to test for the predictability of likability ratings: At Step 1, degree of acquaintance was entered; at Step 2, the three primary main effects of targets' self-esteem scores, ego threat status (where -1 = *not threatened*, 1 = *threatened*), and gender (where -1 = *female*, 1 = *male*) were entered; at Step 3, the three two-way interactions (e.g., Self-Esteem \times Ego Threat Status) between the primary main effects were entered; and at Step 4, the multiplicative three-way interaction of Self-Esteem \times Ego Threat Status \times Gender was entered.⁴

Consistent with our predictions, the results of this model revealed a significant three-way interaction of self-esteem scores, gender, and ego threat status, $t(363) = 2.54, p = .01, \beta = -.15$ (see Table 1). The only other term to predict likability in this last stage of the model was the marginal, positive effect of acquaintance, $t(363) = 1.69, p = .09, \beta = .09$. Figures 1 and 2 display the effects of self-esteem and ego threat status for men and women separately.

The pattern of results suggested that the interaction of self-esteem and ego threat was perhaps better captured by a nonlinear model (see Figures 1 and 2). A visual inspection of the residuals further supported the presence of a nonlinear function, with scatterplots of the

TABLE 1: Self-Esteem, Ego Threat Status, Gender, and Their Interactions Predicting Likability Ratings

Order of Entry of Set	Predictors in Set	F for Set	t for		Model R ² (ΔR^2)
			Within-Set Predictors	df	
1.	Covariate Acquaintance ratings	2.34		1, 370	.006 (.006)
2.	Main effects Self-esteem Ego Threat Status Gender	.59	1.53 .32 .64 -1.05	3, 367	.01 (.005)
3.	Two-way interactions Gender \times Self-Esteem Ego Threat \times Self-Esteem Gender \times Ego Threat	.43	-0.92 -0.36 .34	3, 364	.015 (.004)
4.	Three-way interaction SE \times Threat \times Gender	6.46**		1, 363	.032 (.017)
			2.54**		

NOTE: *Self-esteem (SE)* stands for scores on a modified version of the State Self-Esteem Scale (SSES) (Heatherton & Polivy, 1991), as assessed during high school. *Ego threat* represents targets' status on the ego threat variable, as determined by amount and direction of self-esteem change from high school to college and where 1 = *threatened* and -1 = *not threatened*. Gender is coded such that 1 = male and -1 = female. Acquaintance ratings are Likert-type ratings of the raters' acquaintance with the target at the time of likability assessment. Likability ratings are raters' judgments of the targets' likability on a scale from 1 to 7 (where 1 = *not at all* and 7 = *very much*). *F* for set indicates the change in *F* (with its significance level denoted, when appropriate) at each step in the model. ΔR^2 = change in R^2 with the addition of each step in the regression.

** $p \leq .01$.

residuals suggesting a quadratic function (Darlington, 1990). To test for a nonlinear pattern, we computed a hierarchical regression model that included the linear variables included in the initial linear model (listed above) as well as the squared effect of self-esteem, the multiplicative interaction of squared self-esteem scores and ego threat status, and the interaction of squared self-esteem scores and gender, as well as the three-way interaction of squared self-esteem scores, ego threat status, and gender. The results of this model supported our visual appraisals in showing that the quadratic form of the three-way interaction was a marginally significant predictor of likability, above and beyond the effects of all other terms, $t(360) = 1.70, p = .09, \beta = .20$. In this last run of the model, the linear three-way interaction of self-esteem scores, ego threat status, and gender remained a significant predictor, $t(360) = 2.11, p = .035, \beta = .15$, and the quadratic form of the Self-Esteem \times Ego Threat Status variable was marginally significant, $t(360) = 1.84, p < .07, \beta = .26$.⁵

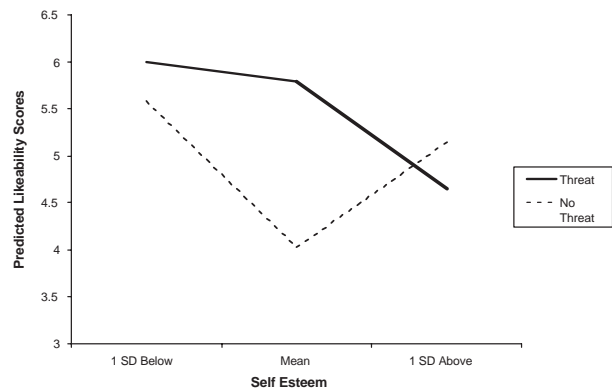


Figure 1 Self-esteem, ego threat status, and likability among men.
NOTE: 1 *SD below*, *mean*, and 1 *SD above* represent points on the self-esteem continuum. Self-esteem was assessed by a modified version of the State Self-Esteem Scale (SSES) (Heatherton & Polivy, 1991). *Threat* and *no threat* represent targets' status on the ego threat variable, as determined by amount and direction of self-esteem change from high school to college. Predicted likability ratings were computed using an equation that included the model's intercept; ratings of acquaintance; self-esteem scores; ego threat category; gender; the two- and three-way interactions among self-esteem, threat, and gender; and also the quadratic form of self-esteem combined with threat and gender (quadratic three-way interaction, $t[360] = 1.70$, $p = .09$, $\beta = .20$).

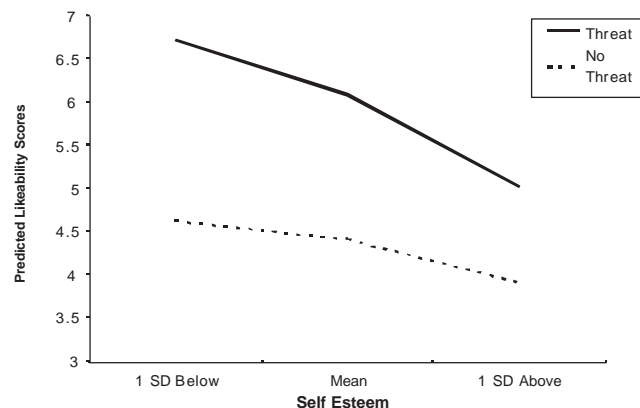


Figure 2 Self-esteem, ego threat status, and likability among women.
NOTE: 1 *SD below*, *mean*, and 1 *SD above* represent points on the self-esteem continuum. Self-esteem was assessed by a modified version of the State Self-Esteem Scale (SSES) (Heatherton & Polivy, 1991). *Threat* and *no threat* represent targets' status on the ego threat variable, as determined by amount and direction of self-esteem change from high school to college. Predicted likability ratings were computed using an equation that included the model's intercept; ratings of acquaintance; self-esteem scores; ego threat category; gender; the two- and three-way interactions among self-esteem, threat, and gender; and also the quadratic form of self-esteem combined with threat and gender (quadratic three-way interaction, $t[360] = 1.70$, $p = .09$, $\beta = .20$).

We next wanted to assess whether the combination of gender and self-esteem had different consequences for likability under conditions of threat and no threat. Past work has shown no effect of self-esteem in predicting likability of men and women (separately) (Heatherton &

Vohs, 2000; Vohs & Heatherton, 2001, 2003), and this test assesses the reliability of that effect. As expected, among nonthreatened participants, there was no predictive ability of any of the factors (acquaintance, self-esteem, gender, and the Self-Esteem \times Gender interaction) on likability, $t(265) < 1.31$. In contrast, likability ratings for threatened targets were significantly predicted by the Gender \times Self-Esteem interaction, $t(97) = 2.24$, $p = .03$, $\beta = -.23$. As seen in Figures 1 and 2, the effects of threat and self-esteem differed for men and women.

Our next set of analyses changed the focus slightly to examine the linear effects of self-esteem and ego threat status on likability, as computed separately for men and women (see Figures 1 and 2). The regression model included the main effect of acquaintance at Step 1, the two main effects of ego threat status and self-esteem scores at Step 2, and the two-way interaction of self-esteem and ego threat status at Step 3. This model revealed that the two-way interaction between self-esteem and ego threat status was a significant predictor of likability of men, $t(151) = 2.22$, $p = .03$, $\beta = -.20$, and also of women, $t(211) = 2.07$, $p = .04$, $\beta = .09$. The sign of the beta weights, as well as the patterns shown in Figures 1 and 2, indicates that threat had different consequences for the likability of men and women. It appears that being threatened did not appreciably change the likability of high and low self-esteem women, whereas the likability of women with moderate levels of self-esteem was much higher if they were threatened. It appears that threat also boosted the likability of moderate and low self-esteem men, whereas threat reduced the likability of high self-esteem men. These patterns are consistent with previous findings of increased likability among low self-esteem men under threat and decreased likability of high self-esteem men under threat (Heatherton & Vohs, 2000; Vohs & Heatherton, 2001).

Given that the overall polynomial analyses indicated that, in addition to linear effects, there was some nonlinearity in the data, we again tested for quadratic effects. We added to the linear regression model (computed separately for men and women) the squared self-esteem term and its interaction with ego threat status to predict likability. These terms, however, did not significantly add to the predictability of liking, $t_s \leq 1.38$, $p_s > .18$.

We next dissected likability separately for women and men. For women, we first examined the effect of self-esteem on likability. There was no effect of self-esteem on likability of nonthreatened or threatened women, $t(141) < 1$, $\beta = -.05$, and $t(69) < 1$, $\beta = .05$, respectively, and the addition of the quadratic self-esteem term did not add significantly to either model, $t_s < 1$. Perhaps the best way to understand the relationship between threat and self-esteem for women is to point out that there was no

effect of ego threat status on likability for low or high self-esteem women, $t(78) < 1$, $\beta = -.04$, and $t(55) < 1$, $\beta = .02$, whereas ego threat status did predict likability for women with moderate self-esteem, $t(77) = 1.89$, $p = .06$, $\beta = .21$. The effect of threat on likability for women with medium self-esteem was positive, meaning that for these women, being threatened was associated with more likability.

In contrast to the somewhat weaker effects of self-esteem on likability among women, self-esteem was a strong predictor of likability for men. There were two near-significant linear (but in the opposite directions) effects of self-esteem on likability for nonthreatened and threatened men, $t(123) = 1.90$, $p < .06$, $\beta = .17$, for nonthreatened men and $t(27) = 1.57$, $p = .12$, $\beta = -.29$, for threatened men. For nonthreatened men, higher self-esteem was related to higher likability. Among threatened men, however, the exact opposite was found: Lower self-esteem was related to higher likability and higher self-esteem was related to lower likability. A look at Figure 1 indicates that there may be a nonlinear effect, a suggestion that is bolstered by the finding of a significant effect of squared self-esteem scores on the likability of threatened male targets, $t(27) = 2.20$, $p < .04$, $\beta = -.40$. (There was no additional predictability of liking from the quadratic term for nonthreatened men, $t[123] < 1$.) Descriptively, it can be seen that both low and medium self-esteem men who were threatened were liked quite well (and fairly equally), whereas high self-esteem, threatened men were liked least of all (see Figure 1).

RATINGS OF PERSONALITY CHARACTERISTICS

Next, we analyzed the personality trait ratings. Given that the same factor structure has been found across multiple studies and in an effort to compare findings in the current study to earlier findings, we grouped personality traits using the personality factor structure used in previous research. The factor we termed Antagonism has been the focus of past studies of self-esteem, threat, and likability. It is composed of the traits arrogant, fake, uncooperative, rude, and unfriendly. The other personality factors examined in the current study are called Depressive (composed of the traits lethargic, gloomy, lazy, shy, timid, and yielding) and an overall Positivity factor (composed of the traits calm, honest, congenial, intelligent, reasonable, refined, unassuming, restrained, cautious, and practical). We begin with analyses of the Antagonism factor.

Antagonism ratings. We analyzed ratings on the Antagonism factor using the same linear hierarchical regression model (the main effects of acquaintance, self-esteem, ego threat status, gender; the three two-way interactions of the self-esteem, threat, and gender variables; and their triple interaction) that was used to

predict likability ratings. Results from this model also supported our hypotheses and previous research in showing that there is a triple interaction among self-esteem, ego threat status, and gender, $t(363) = 2.59$, $p = .01$, $\beta = .14$ (see Table 2), and the two-way interaction of self-esteem and threat remained near significance in this last stage of the model, $t(363) = 1.81$, $p = .07$, $\beta = -.18$. There were also main effects of acquaintance, $t(363) = 6.13$, $p < .0001$, $\beta = -.18$, and of gender, $t(363) = 1.91$, $p < .06$, $\beta = .14$, indicating that being acquainted was related to lower ratings of Antagonism and also that men were rated as higher in Antagonism. Two additional regression models that included the first-, second-, and then the third-order quadratic terms revealed no additional predictability, $t < 1.3$. Accordingly, we examine the linear effects of self-esteem and ego threat status on ratings of Antagonism separately for men and women.

We conducted a regression analysis that included acquaintance, the self-esteem and ego threat condition main effects, and their linear two-way interaction in predicting ratings of Antagonism for male targets. Ratings of Antagonism for men were predicted by acquaintance level, $t(151) = 3.81$, $p < .001$, $\beta = -.29$, and a significant effect of the interaction term, $t(151) = 1.95$, $p = .054$, $\beta = .17$. The sign of the beta weight indicates that higher self-esteem and being threatened was related to being seen as higher in Antagonism (see Figure 3). Analyses within the differing levels of self-esteem showed differential patterns of Antagonism as a function of whether participants were threatened. Replicating past research, among high self-esteem men, threat was related to significantly higher ratings of Antagonism, $t(59) = 2.91$, $p < .01$, $\beta = .35$, whereas there was no effect of threat among men with low or medium self-esteem, $t < 1.2$.

This same regression model conducted to predict Antagonism ratings of women showed no significant effect of the Self-Esteem \times Ego Threat interaction term, $t(211) < 1$, $\beta = -.04$ (see Figure 4). Thus, in contrast to ratings of men, in which the Antagonism factor played a large role, self-esteem and ego threat status may not contribute as much to perceptions of women on the Antagonism factor. Indeed, as shown later, the personality factors predicted by self-esteem and ego threat status differ for women.

Depressive ratings. Again, we first computed a regression model in which we tested the main effects (including acquaintance); two-way interactions; and three-way interaction of self-esteem, ego threat status, and gender in predicting ratings on the Depressive factor (i.e., lethargic, gloomy, lazy, shy, timid, and yielding). The triple interaction was a significant predictor of ratings on the Depressive factor, $t(363) = 1.97$, $p = .05$, $\beta = .11$ (see Table 3). In the last step of the model, the only other predictors of Depressive ratings were the main effects of self-

TABLE 2: Self-Esteem, Ego Threat Status, Gender, and Their Interactions Predicting Antagonism Ratings

Order of Entry of Set	Predictors in Set	F for Set	t for Within-Set Predictors	df	Model R ² (ΔR^2)
1.	Covariate	36.41***		1, 370	.090 (.090)
	Acquaintance ratings		6.03***		
2.	Main effects	4.10**		3, 367	.119 (.030)
	Self-esteem		-.02		
	Ego threat status		2.00*		
	Gender		3.05**		
3.	Two-way interactions	.80		3, 364	.125 (.006)
	Gender × Self-Esteem		-.87		
	Ego Threat × Self-Esteem		.84		
	Gender × Ego Threat		.94		
4.	Three-way interaction	6.71**		1, 363	.141 (.016)
	SE × Threat × Gender		2.59**		

NOTE: *Self-esteem (SE)* stands for scores on a modified version of the State Self-Esteem Scale (SSES) (Heatherton & Polivy, 1991), as assessed during high school. *Ego threat* represents targets' status on the ego threat variable, as determined by amount and direction of self-esteem change from high school to college and where 1 = *threatened* and -1 = *not threatened*. Gender is coded such that 1 = male and -1 = female. Acquaintance ratings are Likert-type ratings of the raters' acquaintance with the target at the time of likability assessment. Antagonism ratings are raters' judgments of the targets on the traits arrogant, fake, uncooperative, rude, and unfriendly; higher numbers indicate greater perceptions of Antagonistic qualities. *F* for set indicates the change in *F* (with its significance level denoted, when appropriate) at each step in the model. ΔR^2 = change in *R*² with the addition of each step in the regression.

* $p < .05$. ** $p \leq .01$. *** $p < .001$.

esteem scores, $t(363) = 3.37$, $p < .001$, $\beta = -.21$, and a marginal effect of acquaintance, $t(363) = 1.72$, $p < .09$, $\beta = -.09$, effects indicating that low self-esteem and lower levels of acquaintance are predicted to high Depressive ratings. A regression model that included all of the quadratic terms described earlier revealed a trend toward a predictive three-way interaction of Quadratic Self-Esteem Term × Ego Threat Status × Gender, $t(357) = 1.50$, $p = .13$, $\beta = -.22$. In this model, the linear three-way interaction remained only slightly diminished, $t(357) = 1.59$, $p = .11$, $\beta = .11$. There was also a main effect of linear self-esteem scores, $t(357) = 1.99$, $p < .05$, $\beta = -.18$, and an interaction of the Quadratic Self-Esteem × Ego Threat term, $t(357) = 2.04$, $p < .05$, $\beta = -.29$. A third model that included the cubic terms did not add to the predictability of Depressive ratings, all t s < 1.

Among men, self-esteem scores were the only significant predictor of Depressive ratings, $t(150) = 2.14$, $p < .04$, $\beta = -.18$, which indicated that low self-esteem was

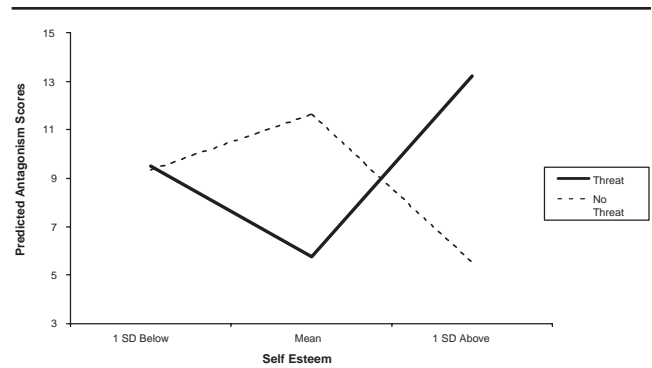


Figure 3 Self-esteem, ego threat status, and Antagonism among men. NOTE: 1 *SD below*, *mean*, and 1 *SD above* represent points on the self-esteem continuum. Self-esteem was assessed by a modified version of the State Self-Esteem Scale (SSES) (Heatherton & Polivy, 1991). *Threat* and *no threat* represent targets' status on the ego threat variable, as determined by amount and direction of self-esteem change from high school to college. Predicted Antagonism ratings were computed using an equation that included the model's intercept, ratings of acquaintance, self-esteem scores, ego threat category, gender, and the three-way interaction. Results from this model revealed a triple interaction among self-esteem, ego threat status, and gender, $t(363) = 2.59$, $p = .01$, $\beta = .14$.

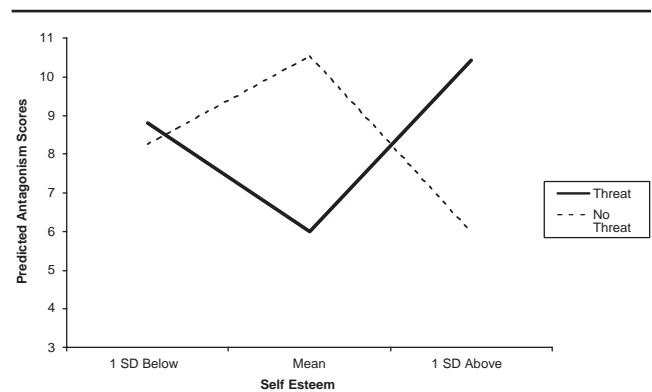


Figure 4 Self-esteem, ego threat status, and Antagonism among women.

NOTE: 1 *SD below*, *mean*, and 1 *SD above* represent points on the self-esteem continuum. Self-esteem was assessed by a modified version of the State Self-Esteem Scale (SSES) (Heatherton & Polivy, 1991). *Threat* and *no threat* represent targets' status on the ego threat variable, as determined by amount and direction of self-esteem change from high school to college. Predicted Antagonism ratings were computed using an equation that included the model's intercept; ratings of acquaintance; self-esteem scores; ego threat category; gender; and the three two-way interactions between threat, self-esteem, and gender, and the three way interaction. Results from this model revealed a triple interaction among self-esteem, ego threat status, and gender, $t(363) = 2.59$, $p = .01$, $\beta = .14$.

related to perceptions of Depressiveness. (In the nonlinear models, there was only a significant cubic effect of self-esteem, $t[147] = 1.94$, $p = .05$, $\beta = -.72$.) An examination of the means within condition (see Figure 5), however, suggested a different way to understand the effect of self-esteem and threat among men. Analyses of the effect of threat as a function of self-esteem demonstrated

TABLE 3: Self-Esteem, Ego Threat Status, Gender, and Their Interactions Predicting Depressive Ratings

Order of Entry of Set	Predictors in Set	F for Set	t for Within-Set Predictors		Model R ² (ΔR^2)
				df	
1.	Covariate	1.61		1, 370	.004 (.004)
	Acquaintance ratings		1.27		
2.	Main effects	6.34**		3, 367	.054 (.049)
	Self-esteem		4.36***		
	Ego threat status		.51		
	Gender		.97		
3.	Two-way interactions	.91		3, 364	.065 (.007)
	Gender × Self-Esteem		.69		
	Ego Threat × Self-Esteem		1.12		
	Gender × Ego Threat		-.87		
4.	Three-way interaction	3.42		1, 363	.069 (.009)
	SE × Threat × Gender		1.85†		

NOTE: *Self-esteem (SE)* stands for scores on a modified version of the State Self-Esteem Scale (SSES) (Heatherton & Polivy, 1991), as assessed during high school. *Ego threat* represents targets' status on the ego threat variable, as determined by amount and direction of self-esteem change from high school to college and where 1 = *threatened* and -1 = *not threatened*. *Gender* is coded such that 1 = male and -1 = female. Acquaintance ratings are Likert-type ratings of the raters' acquaintance with the target at the time of likability assessment. Depressive ratings are raters' judgments of the targets on the traits lethargic, gloomy, lazy, shy, timid, and yielding; higher numbers indicate greater perceptions of Depressive qualities. *F for set* indicates the change in *F* (with its significance level denoted, when appropriate) at each step in the model. ΔR^2 = change in *R*² with the addition of each step in the regression.

†*p* < .07. ***p* ≤ .01. ****p* < .001.

that among low self-esteem men, the effect of threat was to decrease Depressive ratings, $t(20) = 2.40, p < .03, \beta = -.47$. There was no effect of threat on Depressive ratings of medium or high self-esteem men.

Among women, we tested the linear effects of self-esteem, ego threat status, and their combination on Depressive ratings and found a near significant two-way interaction of self-esteem and threat, $t(210) = 1.78, p = .08, \beta = -.13$, as well as a main effect of self-esteem, $t(210) = 2.55, p = .01, \beta = -.24$. (There were no significant quadratic effects, $t < 1$.) A breakdown of threatened versus nonthreatened women showed that self-esteem had a consistently significant effect in both conditions, $t(69) = 2.76, p < .01, \beta = -.32$, for threatened women and $t(141) = 2.11, p < .04, \beta = -.18$, for nonthreatened women. The interaction effect, then, indicates that self-esteem was a stronger predictor of ratings of Depressive qualities among women who were threatened, relative to those who were nonthreatened (see Figure 6).

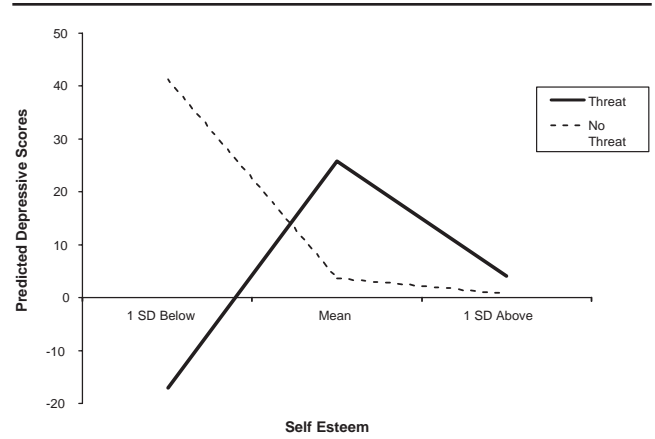


Figure 5 Self-esteem, ego threat status, and Depressive ratings among men.

NOTE: 1 *SD below*, *mean*, and 1 *SD above* represent points on the self-esteem continuum. Self-esteem was assessed by a modified version of the State Self-Esteem Scale (SSES) (Heatherton & Polivy, 1991). *Threat* and *no threat* represent targets' status on the ego threat variable, as determined by amount and direction of self-esteem change from high school to college. Predicted depressive ratings were computed using an equation that included the model's intercept, ratings of acquaintance, self-esteem scores, ego threat category, gender, their two- and three-way interactions, and the quadratic form of self-esteem combined with threat and gender. Results from this model revealed a quadratic two-way interaction of $t(357) = 2.04, p = .05, \beta = -.29$, and a quadratic three-way interaction of $t(357) = 1.50, p < .14, \beta = -.23$.

Ratings on the remaining traits. Using a similar analytic scheme, we tested for predictors of ratings on the rest of the traits, which were scored according to their positivity and summed into an overall Positivity factor. This factor was composed of the traits calm, honest, congenial, intelligent, reasonable, refined, unassuming, restrained, cautious, and practical. In the linear regression model, the predictability of the three-way interaction of self-esteem scores, ego threat status, and gender trended toward significance, $t(363) = 1.44, p = .15, \beta = -.08$, and the main effect of acquaintance was significant, $t(363) = 4.36, p < .001, \beta = .22$, indicating that being better acquainted predicted higher ratings on the Positivity factor. Ratings on this factor were not predicted by any of the quadratic or cubic terms, $t_s < 1.40$.

MEDIATIONAL ANALYSES

Mediation by Antagonism ratings. In addition to testing for the interactive effects of self-esteem and ego threat on subsequent interpersonal perceptions, previous research has examined both interpersonal (Heatherton & Vohs, 2000) and intrapersonal (Vohs & Heatherton, 2001) mechanisms for these effects. Hence, in the current study, we also sought to replicate and extend previous mediational analyses; specifically, we were interested in assessing whether Antagonism ratings statistically mediated the effects of the Self-Esteem × Ego Threat Status interaction on ratings of likability. Past findings have

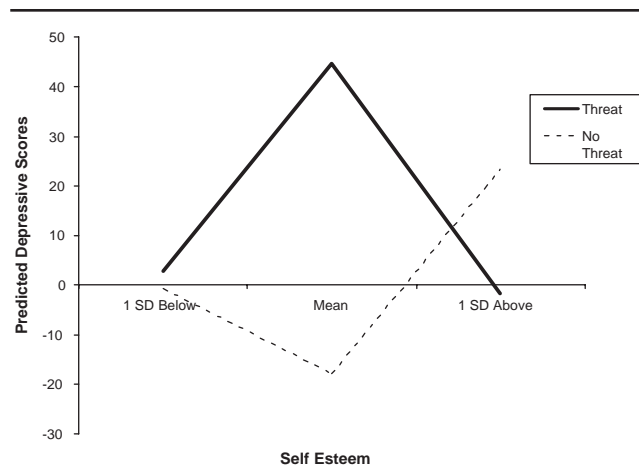


Figure 6 Self-esteem, ego threat status, and Depressive ratings among women.

NOTE: 1 *SD below*, *mean*, and 1 *SD above* represent points on the self-esteem continuum. Self-esteem was assessed by a modified version of the State Self-Esteem Scale (SSES) (Heatherton & Polivy, 1991). *Threat* and *no threat* represent targets' status on the ego threat variable, as determined by amount and direction of self-esteem change from high school to college. Predicted depressive ratings were computed using an equation that included the intercept, ratings of acquaintance, self-esteem scores, ego threat category, gender, their two- and three-way interactions, and the quadratic form of self-esteem combined with threat and gender. Results from this model revealed a quadratic two-way interaction of $t(357) = 2.04, p = .05, \beta = -.29$, and a quadratic three-way interaction of $t(357) = 1.50, p < .14, \beta = -.23$.

indicated the presence of full mediation (Heatherton & Vohs, 2000, Study 1) and also moderated mediation (Heatherton & Vohs, 2000, Study 2) by Antagonism on likability ratings.

The first set of analyses we conducted tested for full mediation. We had established that the three-way interaction of self-esteem, ego threat status, and gender significantly predicted ratings of likability and ratings of Antagonism, thereby meeting two of the requirements of mediation (Baron & Kenny, 1986). The third step was to test for a significant relationship between the hypothesized mediator and the dependent measure. As expected, the correlation between Antagonism ratings and likability ratings was significant (and directionally opposite), $r(372) = -.67, p < .0001$. Hence, to the linear regression model used to predict likability, we added the main effect of Antagonism scores to assess whether its presence significantly affected the predictability of likability from the three-way interaction. In support of a full mediation effect, the addition of Antagonism discernibly changed the magnitude of the three-way interaction term, $t(362) = 1.04, p = .30, \beta = -.05$ (compare to the three-way interaction term's effect in the absence of Antagonism ratings, $t[372] = 2.54, p = .01, \beta = -.15$).

To test for a moderated mediational pattern, we computed a regression model that included the main effects of self-esteem scores, ego threat status, gender, acquaint-

tance, and Antagonism ratings; the six two-way interactions (e.g., Antagonism \times Ego Threat Status); the four three-way interactions; and the four-way interaction of Self-Esteem Scores \times Ego Threat Status \times Gender \times Antagonism Ratings. Results of this analysis did not support the operation of moderated mediation in showing that the four-way interaction (required to show moderated mediation) was not a significant predictor, $t(356) = 1.03, p = .30, \beta = -.12$.

In sum, Antagonism ratings appeared to statistically account for ratings of likability within the ego threat, self-esteem, and gender model. When the main effect of Antagonism ratings was entered into the model predicting likability, the previously significant Self-Esteem \times Ego Threat \times Gender Term was rendered nonsignificant.

Mediation by Depressive ratings. We also sought to test another possible mediator: ratings on the Depressive factor. We thought Depressive ratings may represent a mediator of the effects of self-esteem and ego threat status on likability ratings, given the significant two-way interaction of self-esteem and threat among women and that low-self-esteem men were rated as less Depressive when threatened. Full mediational analyses, in which the main effect of Depressive ratings was entered into the main regression model to predict likability, failed to reduce the significance of the three-way Self-Esteem \times Ego Threat Status \times Gender interaction, $t(362) = 2.21, p < .03, \beta = -.13$. Moreover, a regression model built to test for moderated mediational effects also showed no effects of Depressive ratings, in that the interaction of Depressive ratings, self-esteem, ego threat status, and gender was nonsignificant, $t(355) < 1, \beta = -.05$. Moreover, the three-way interaction of self-esteem, gender, and threat remained significant in this model, $t(355) = 2.29, p < .02, \beta = -.15$. Thus, it did not appear that Depressive ratings acted as a mediator of likability ratings, as did Antagonism ratings.

Discussion

Across several models and tests, we found consist support for our prediction that the interaction of self-esteem scores, ego threat, and gender predicts likability. Replicating our past research, the two-way interaction predicted likability significantly among men and women separately. The quadratic version of this two-way relationship also was found to be significant in predicting likability for the whole sample. Additional analyses revealed a marginally significant quadratic effect of Self-Esteem \times Gender \times Threat, and this effect was especially pertinent in explaining the effect of self-esteem on the likability of threatened men.

Descriptively, we found that threat produced somewhat different patterns of likability among men and women. High and low self-esteem women were liked

equally regardless of whether they were threatened, whereas women with moderate self-esteem were liked significantly more when threatened. This latter finding complemented the findings for men with medium level of self-esteem, who also rose in likability when threatened. We also found that men with low self-esteem increased in likability when they were threatened, whereas high self-esteem, threatened men decreased in likability, two findings that nicely replicate past laboratory findings on the effects of self-esteem on likability under conditions of threat (Heatherton & Vohs, 2000; Vohs & Heatherton, 2001). In short, although the main consequence of threat for women was to increase the likability of medium self-esteem women, the effect of threat for men was more robust in that it increased the likability of both medium and low self-esteem men and decreased the likability of high self-esteem men.

It is interesting to note that the findings from the current study line up quite well with those of our past laboratory research if one were to map the medium and high self-esteem groups in the current study onto the low and high self-esteem groups in past studies. This substitution would show an almost perfect convergence of findings between the two sets of research (with the exception of high self-esteem women in the current study who were liked equally regardless of whether they were threatened). A possible reason that medium self-esteem people in the current sample looked like low self-esteem people in our laboratory samples is that the larger sample size in the current study contained a greater number of low self-esteem people with depressive symptoms. Indeed, the comorbidity of low self-esteem and depression may provide a partial account for differences in ratings of nonthreatened, low self-esteem men across laboratory and naturalistic studies (see Baumeister et al., 2003, for a discussion of the correlates of low self-esteem).

Regarding ratings of the personality factors, our previous research suggested that Antagonism ratings would be most important in understanding the relations among gender, self-esteem, ego threat, and likability (Heatherton & Vohs, 2000; Vohs & Heatherton, 2001), and we also found this to be the case in the current data. We found that Antagonism scores (i.e., ratings on the traits rude, arrogant, unfriendly, fake, and uncooperative) were significantly predicted by the Self-Esteem \times Ego Threat Status \times Gender interaction (see Figures 3 and 4). Ratings of Antagonism were further found to be important in statistically accounting for changes in likability. The inclusion of Antagonism ratings weakened the effect of the self-esteem, ego threat status, and gender term on likability to nonsignificance. This effect replicates mediational results found in past laboratory research using male dyads (Heatherton & Vohs, 2000, Study 1). Among women, being threatened appeared to

mainly affect impressions of Depressiveness among low self-esteem women, for whom the highest ratings were found. Among men, however, the combination of threat and low self-esteem produced the lowest ratings on the Depressive factor.

In sum, the current results converged most strongly with previous findings demonstrated in laboratory settings for ratings of men. As predicted, high self-esteem men were seen as less likable and as possessing more negative personality traits (especially those relating to arrogance, unfriendliness, and rudeness; i.e., the Antagonism factor) when threatened. Also as predicted, threatened men with low self-esteem were more likable than those who were not threatened. The results are remarkably consistent with the results of previous studies, given the diverse methodology and operationalizations.

Connections to Other Research

Several of the results from the current study encourage links to other research on self-esteem and interpersonal perceptions. To begin, we see conceptual similarities between the association between ratings on the Depressive factor and ratings of likability and findings from Joiner and his colleagues (Joiner et al., 1992, 1993). Joiner and colleagues found that the combination of depression and reassurance-seeking (a characteristic that often co-occurs with depression) in men was sufficiently aversive for their roommates to reject them. Joiner et al. (1992) speculate that such a pattern might occur because men who constantly seek reassurance violate gender norms of autonomy; indeed, they found depressed men who did not seek reassurance (i.e., those who “suffered in silence”) were not rejected. Returning to the current study, two relevant patterns are notable: (a) low self-esteem men who were not threatened were rated highest on the Depressive factor and also were rated lowest in likability and (b) low self-esteem men who were threatened—and who, not incidentally, were seen as quite likable—were rated the lowest on the Depressive factor. These patterns may represent the positive outcomes for men of “suffering in silence” and the terribly costly repercussions of acting Depressive.

We found that threat increased the likability of three groups of targets: low self-esteem men, medium self-esteem men, and medium self-esteem women. From a sociometer perspective (Leary, Tambor, Terdal, & Downs, 1995), it may be that being threatened “activated” the sociometers of low to moderate self-esteem people in such a manner to elicit positive interpersonal behaviors from them. In support of this reasoning, research has found that low self-esteem people who receive an ego threat (e.g., negative feedback about the self) tend to overgeneralize the threat to other aspects of the self. For instance, accessibility of personal strengths

decreases and accessibility of weaknesses increases among low self-esteem people after threat (Dodgson & Wood, 1998). Moreover, Baldwin and Sinclair (1996) found that among lower—but not higher—self-esteem people, semantic primes that suggest failure (e.g., lose, incompetent) prompted faster recognition of social exclusion words (e.g., disliked, ridiculed), suggesting that those with lower levels of self-esteem possess a sense of “contingent acceptance” that makes them vigilant for indications of interpersonal rejection. In addition, differences in the most accessible and available aspects of the self-concept emerge after threat among higher and lower self-esteem people. Threatened, lower self-esteem people think of the self in highly interpersonal terms, emphasizing their interdependence and social ties, whereas threatened, higher self-esteem people emphasize their autonomy and what makes them stand out in a crowd (Vohs & Heatherton, 2001). Thus, when people with lower and moderate levels of self-esteem feel threatened, they may become highly motivated to display likable interpersonal patterns in the hopes of attaining social acceptance.

Several of the results from the current study may be relevant to other research on self-esteem and interpersonal perceptions. One possibility is that self-esteem stability played a role in the current set of findings. Perhaps people who have unstable self-views are most affected by the turmoil and change that accompanies college matriculation. In the face of negative feedback about the self (i.e., threat), unstable, high self-esteem people react with defensiveness and refutation of the feedback, whereas people with unstable, low self-esteem react with greater acceptance, less excuse-making, and view the feedback as credible (see Kernis, Cornell, Sun, Berry, & Harlow, 1993). These reactions appear similar to the interpersonal perceptions related to the Antagonism factor, and thus stability of self-esteem may contribute to the current findings.

Last, we must address an alternative explanation for the current results. It is possible that men and women who were rejected by their peers subsequently experienced a drop in self-esteem. This approach would suggest that rejection caused reduced self-esteem rather than reduced self-esteem causing rejection. Two factors mitigate such an explanation. First, the results of the current study and those from multiple laboratory studies (Heatherton & Vohs, 2000; Vohs & Heatherton, 2001) show that decreases in self-esteem are not uniformly associated with decreased likability; indeed, this research indicates that low self-esteem men who experience decreased self-esteem are viewed quite positively by their peers. Second, an examination of changes in participants' self-esteem scores reveals that decrements in self-

esteem were due mainly to fluctuations in performance self-esteem and not to changes in social or appearance self-esteem. Indeed, social self-esteem scores increased slightly among our participants, thereby indicating that participants were not feeling rejected or ostracized. Thus, it is our contention that being threatened leads to behavioral changes that result in changes in likability and perceptions of personality traits.

FUTURE DIRECTIONS

There were several aspects of this study that were intriguing and call out for additional research. First, recall that medium self-esteem men and women were very likable when threatened. Of interest, medium self-esteem men also were rated quite high in Antagonism. This suggests that among men with moderate self-esteem, the mental processes initiated to cope with threat resemble those used by people with high self-esteem to cope with threat (e.g., thinking of the self as independent and autonomous) (Vohs & Heatherton, 2001), but with the consequences of the interpersonal patterns of those with threatened low self-esteem (e.g., being seen as more likable). This possibility is particularly interesting because it suggests that men with moderate levels of self-esteem may be able to defend the self after threat (e.g., by engaging in self-aggrandizement) without incurring the negative interpersonal consequences that typically follow (Heatherton & Vohs, 2000; Vohs & Heatherton, 2001). Among women, we saw that threat also produced an increase in likability, but not a concomitant increase in ratings of Antagonism. We encourage future research to investigate the possibilities of diverging intrapsychic and interpersonal behaviors among men and women, especially as exemplified by those with moderate self-esteem.

We also see the correspondence between threat versus nonthreat, likability versus unlikability, and high versus low Depressive ratings (especially for people with low self-esteem) as a fascinating area for future research. Particularly valuable would be research aimed at addressing the mechanisms and parameters of these effects. Measuring depressive symptoms in threatened and nonthreatened people (either in the laboratory or in a naturalistic investigation) would be crucial to understanding how clinical symptoms of depression interact with a self-threat to affect likability. It may be that one of the effects of an ego threat is to alter depressive symptoms for a subset of low self-esteem people, the result of which may be to elicit more positive evaluations from others. Our data on Depressive ratings also suggest that gender of the target may affect interpersonal consequences of threat, self-esteem, and possible depressive symptoms. We find especially relevant the work of Joiner et al. (1992, 1993), who

found that the effects of depressiveness and reassurance-seeking were only detrimental to the interpersonal relationships of men; women who sought reassurance from their roommates did not evoke disdain from their roommates, possibly because such behavior in women is consistent with gender stereotypes. The consistency and differences between this research and the current work suggests a need to better understand the intricacies of these variables and their joint effects.

Regarding gender differences and similarities in interpersonal processes and perceptions, we point to recent empirical and theoretical evidence suggesting that men and women may have comparable motives for social integration but differ in the scope of their social concerns. Baumeister and Sommer (1997) have argued that women are more oriented toward dyadic relationships, whereas men are more concerned with interpersonal perceptions on a group level, a postulate confirmed empirically by Gabriel and Gardner (1999). Thus, it may be that the differences in interpersonal perceptions of women in the current study versus past laboratory research arise from women's sensitivity to the dyadic context, which differs between a naturalistic and laboratory setting.

SUMMARY

The results of this study point to some interesting differences and some striking similarities between this and past laboratory research. Replicating past research, we found that high-self-esteem men and women who were threatened were seen as unlikable, whereas low self-esteem men who were threatened were seen as quite likable. We also found that the medium self-esteem group was rated quite high in likability when threatened. Ratings on the Antagonism factor increased for men who were high in self-esteem and who were threatened, and ratings on the Antagonism factor were found to statistically mediate the link between self-esteem, ego threat status, and gender on likability. Given that some patterns of interpersonal perceptions (especially for low self-esteem women and nonthreatened men) differed from past findings, this suggests that time, context, and acquaintance changes the way that people are viewed under some conditions. In sum, the results of this study demonstrate that the combination of ego threat and self-esteem has real-world implications for social relations.

NOTES

1. We wanted to examine whether gender of the rater was a significant factor in predicting interpersonal perceptions of the target, because past research on interpersonal perceptions suggests that gender of the perceiver and gender of the target may be associated with differential effects (e.g., Rudman, 1998). To test for gender of rater effects, we first centered the rater-gender variable and then computed the four two-way interactions with gender of target, target self-esteem

score at Time 1, and target ego threat classification, along with the three additional three-way interactions (e.g., Gender-Rater \times Gender-Target \times Target Ego Threat) and the new four-way interaction. Entering these terms, along with acquaintance ratings, into a regression analysis predicting likability ratings revealed no effect of raters' gender: There was no main effect or any significant higher order interactions with other variables, all t s < 1.3 , all p s $> .19$. In fact, of the 16 predictors in this model, the only significant predictor of likability was the three-way interaction of targets' self-esteem, ego threat, and target gender, $t(349) = 2.20, p < .03, \beta = -.13$, an effect that is only slightly different from the three-way interaction that emerged in the original regression model that did not include terms representing gender of the rater, $t(363) = 2.54, p = .01, \beta = -.15$.

2. It is important to demonstrate that initial degree of self-esteem did not predict change in self-esteem from high school to college. This null finding indicates that the move to a highly prestigious college was not differentially threatening for students with varying degrees of self-esteem. This finding refutes the possible explanation that differing levels of likability as a function of initial self-esteem score and threat were caused by the self-evaluations of one group (e.g., people with high self-esteem) being more affected by college matriculation than others, a difference that may have then been a cause of differences in likability. Thus, we were assured that the transition from high school to college was equally likely to change self-esteem across all degrees of initial self-esteem.

3. Because we sought to use ratings of acquaintance as a covariate, we had to first ensure that acquaintance did not interact with the other predictors to influence likability. We computed the three interactions between ratings of acquaintance and gender, acquaintance and self-esteem, and acquaintance and ego threat status and found no interactive effect of acquaintance combined with the other predictor variables on likability: Self-Esteem \times Acquaintance, $r(372) = .002, p = .96$; Gender \times Acquaintance, $r(372) = -.04, p = .44$; and Ego Threat Status \times Acquaintance, $r(372) = .012, p = .82$. Thus, we were allowed to use ratings of acquaintance as a covariate in our regression models as a method of holding constant its effect.

4. To test the predictability of liking ratings using a threat variable that conceptualized change in self-esteem from high school to college as a continuum, we represented the threat variable as the interaction between high school self-esteem scores and college self-esteem scores. As before, we represented trait self-esteem using high school self-esteem scores. We built a regression model to predict likability from ratings of acquaintance, initial self-esteem, threat (i.e., High School Self-Esteem \times College Self-Esteem), and gender, along with the two-way interactions of gender, threat, and self-esteem; the three-way interaction of gender, threat, and self-esteem; the quadratic self-esteem term combined with threat and gender in two- and three-way interactions; and the cubic self-esteem term combined with threat and gender. The results of this model showed that the three-way interaction of self-esteem at high school, self-esteem at college, and gender was a significant predictor of likability scores, $t(357) = 1.79, p = .08, \beta = .19$ (compare to the predictability of the three-way interaction using threat as a categorical variable, $t[360] = 1.70, p = .09, \beta = .20$). In this model, there was a significant quadric main effect of high school self-esteem, $t(357) = 2.83, p < .01, \beta = -.52$; a marginally significant quadratic two-way interaction between self-esteem and threat, $t(357) = 1.60, p < .12, \beta = .19$; a near-significant cubic effect of self-esteem, $t(357) = 1.77, p < .078, \beta = -.37$; and a significant cubic three-way interaction, $t(357) = 3.42, p < .001, \beta = -.54$. These patterns of likability are very close to what was found when threat was conceptualized as a dichotomous variable that was coded for degree and direction of self-esteem change.

5. To ensure that the nonlinear pattern of likability ratings was adequately explained by the quadratic model, as opposed to other polynomial models, we fit a cubic model to the data. We generated all cubic terms and inserted them after the linear and quadratic terms in the regression model in predicting likability. In contrast to the effects of the quadratic terms, the cubic terms in this model did not add to the predictability of liking for the target, with no cubic terms even approaching significance.

REFERENCES

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Baldwin, M. W., & Sinclair, L. (1996). Self-esteem and "If . . . then" contingencies of interpersonal acceptance. *Journal of Personality and Social Psychology*, *71*, 1130-1141.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173-1182.
- Baumeister, R. F. (1982). Self-esteem, self-presentation, and future interaction: A dilemma of reputation. *Journal of Personality*, *50*, 29-45.
- Baumeister, R. F., Campbell, J. D., Krueger, J. I., & Vohs, K. D. (2003). Does high self-esteem cause better performance, interpersonal success, happiness, or healthier lifestyles? *Psychological Science in the Public Interest*, *4*, 1-44.
- Baumeister, R. F., Heatherton, T. F., & Tice, D. M. (1993). When ego threats lead to self-regulation failure: Negative consequences of high self-esteem. *Journal of Personality and Social Psychology*, *64*, 141-156.
- Baumeister, R. F., Smart, L., & Boden, J. M. (1996). Relation of threatened egotism to violence and aggression: The dark side of high self-esteem. *Psychological Review*, *103*, 5-33.
- Baumeister, R. F., & Sommer, K. L. (1997). What do men want? Gender differences and two spheres of belongingness: Comment on Cross and Madson. *Psychological Bulletin*, *122*, 38-44.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.
- Colvin, C. R., Block, J., & Funder, D. C. (1995). Overly positive self-evaluations and personality: Negative implications for mental health. *Journal of Personality and Social Psychology*, *68*, 1152-1162.
- Darlington, R. B. (1990). *Regression and linear models*. New York: McGraw-Hill.
- Dodgson, P. G., & Wood, J. V. (1998). Self-esteem and the cognitive accessibility of strengths and weaknesses after failure. *Journal of Personality and Social Psychology*, *75*, 178-197.
- Funder, D. C., & Colvin, C. R. (1988). Friends and strangers: Acquaintanceship, agreement, and the accuracy of personality judgment. *Journal of Personality and Social Psychology*, *55*, 149-158.
- Gabriel, S., & Gardner, W. L. (1999). Are there "his" and "hers" types of interdependence? The implications of gender differences in collective versus relational interdependence for affect, behavior, and cognition. *Journal of Personality and Social Psychology*, *77*, 642-655.
- Gordon, R. A. (1996). Impact of ingratiation on judgments and evaluations: A meta-analytic investigation. *Journal of Personality and Social Psychology*, *71*, 54-70.
- Heatherton, T. F., & Polivy, J. (1991). Development and validation of a scale for measuring state self-esteem. *Journal of Personality and Social Psychology*, *60*, 895-910.
- Heatherton, T. F., & Vohs, K. D. (2000). Interpersonal evaluations following threats to self: Role of self-esteem. *Journal of Personality and Social Psychology*, *78*, 725-736.
- Heine, S. H., Lehman, D. R., Markus, H. R., & Kitayama, S. (1999). Is there a universal need for positive self-regard? *Psychological Review*, *106*, 766-794.
- Joiner, T. E., Alfano, M. S., & Metalsky, G. I. (1992). When depression breeds contempt: Reassurance seeking, self-esteem, and rejection of depressed college students by their roommates. *Journal of Abnormal Psychology*, *101*, 165-173.
- Joiner, T. E., Alfano, M. S., & Metalsky, G. I. (1993). Caught in the crossfire: Depression, self-consistency, self-enhancement, and the response of others. *Journal of Social & Clinical Psychology*, *12*, 113-134.
- Joiner, T. E., Jr., Vohs, K. D., Katz, J., Kwon, P., & Kline, J. (2003). Excessive self-enhancement in roommate relationships: Her virtue is his vice? *Self and Identity*, *2*, 21-30.
- Kernis, M. H., Cornell, D. P., Sun, C., Berry, A., & Harlow, T. (1993). There's more to self-esteem than whether it is high or low: The importance of stability of self-esteem. *Journal of Personality and Social Psychology*, *65*, 1190-1204.
- Leary, M. R., Tambor, E. S., Terdal, S. K., & Downs, D. L. (1995). Self-esteem as an interpersonal monitor: The sociometer hypothesis. *Journal of Personality and Social Psychology*, *68*, 518-530.
- Lott, A. J., Lott, B. E., Reed, T., & Crow, T. (1970). Personality-trait descriptions of differentially liked persons. *Journal of Personality and Social Psychology*, *16*, 284-290.
- Marsh, H. W., & Parker, J. W. (1984). Determinants of student self-concept: Is it better to be a relatively large fish in a small pond even if you don't learn to swim as well? *Journal of Personality and Social Psychology*, *47*, 213-231.
- McFarlin, D. B., Baumeister, R. F., & Blascovich, J. (1984). On knowing when to quit: Task failure, self-esteem, advice, and nonproductive persistence. *Journal of Personality*, *52*, 138-155.
- Norman, W. T., & Goldberg, L. R. (1966). Raters, ratees, and randomness in personality structure. *Journal of Personality and Social Psychology*, *4*, 1197-1208.
- Paulhus, D. L. (1998). Interpersonal and intrapsychic adaptiveness of trait self-enhancement: A mixed blessing? *Journal of Personality and Social Psychology*, *74*, 1197-1208.
- Robinson, M. D., Johnson, J. T., & Shields, S. A. (1995). On the advantages of modesty: The benefits of a balanced self-presentation. *Communication Research*, *22*, 575-591.
- Rudman, L. A. (1998). Self-promotion as a risk factor for women: The costs and benefits of counterstereotypical impression management. *Journal of Personality and Social Psychology*, *74*, 629-645.
- Schlenker, B. R., & Leary, M. R. (1982). Social anxiety and self-presentation: A conceptualization and model. *Psychological Bulletin*, *92*, 641-669.
- Schneider, D. J., & Turkat, D. (1975). Self-presentation following success or failure: Defensive self-esteem models. *Journal of Personality*, *43*, 127-135.
- Sherman, J. W., & Klein, S. B. (1994). Development and representation of personality impressions. *Journal of Personality and Social Psychology*, *67*, 972-983.
- Tice, D. M., Butler, J. L., Muraven, M. B., & Stillwell, A. M. (1995). When modesty prevails: Differential favorability of self-presentation to friends and strangers. *Journal of Personality and Social Psychology*, *69*, 1120-1138.
- Vohs, K. D., & Heatherton, T. F. (2001). Self-esteem and threats to self: Implications for self-construals and interpersonal perceptions. *Journal of Personality and Social Psychology*, *81*, 1103-1118.
- Vohs, K. D., & Heatherton, T. F. (2003). *Gender and interpersonal appraisals: The effects of self-esteem and ego threat*. Unpublished manuscript, University of British Columbia.
- Vohs, K. D., Heatherton, T. F., & Herrin, M. (2001). Disordered eating and the transition to college: A prospective study. *International Journal of Eating Disorders*, *29*, 280-288.

Received January 17, 2002

Revision accepted November 23, 2002