

# Terror Management Theory and Self-Esteem Revisited: The Roles of Implicit and Explicit Self-Esteem in Mortality Salience Effects

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Three studies tested the roles of implicit and/or explicit self-esteem in reactions to mortality salience. In Study 1, writing about death versus a control topic increased worldview defense among participants low in implicit self-esteem but not among those high in implicit self-esteem. In Study 2, a manipulation to boost implicit self-esteem reduced the effect of mortality salience on worldview defense. In Study 3, mortality salience increased the endorsement of positive personality descriptions but only among participants with the combination of low implicit and high explicit self-esteem. These findings indicate that high implicit self-esteem confers resilience against the psychological threat of death, and therefore the findings provide direct support for a fundamental tenet of terror management theory regarding the anxiety-buffering role of self-esteem.

*Keywords:* death, mortality salience, self-esteem, terror management

Many aspects of life involve avoiding death either physically or psychologically. Terror management theory (TMT) proposes that the purpose of self-esteem is to buffer against the psychological threat of death (Greenberg, Pyszczynski, & Solomon, 1986; Pyszczynski, Greenberg, Solomon, Arndt, & Schimel, 2004; see Becker, 1973). According to the theory, high self-esteem (i.e., the extent to which one holds favorable views of oneself) reflects the successful participation in and internalization of a meaningful cultural worldview. By becoming a valued member of society, linked with like-minded others through shared ideals and beliefs, an individual can manage the potentially paralyzing terror of death and live life with relative equanimity. Conversely, low self-esteem reflects an ineffectual buffer against death anxiety due to failure to meet cultural standards of value. This view of self-esteem forms one of the core pillars of TMT.

Although research has observed that reminders of death (i.e., mortality salience) tend to increase esteem-seeking behavior, the relationship between dispositional self-esteem and reactions to mortality salience has yet to be clearly established. Whereas some studies have found attenuated reactions to mortality salience among people with high (versus low) self-esteem (e.g., Harmon-

Jones et al., 1997), other studies have found the exact opposite pattern (e.g., Baldwin & Wesley, 1996). The current work sought to resolve this inconsistency by examining the link between mortality salience and both explicit (relatively conscious and reflective) and implicit (relatively unconscious and spontaneous) forms of self-esteem.

## Self-Esteem and Mortality Salience

TMT posits that self-esteem buffers against death-related thought and anxiety. Consistent with this view, research has demonstrated that thinking about death (vs. other aversive topics such as dental pain or personal failure) increases the need for self-esteem, as evidenced by increased self-esteem striving and a tendency toward self-enhancement (for a review, see Pyszczynski et al., 2004). This evidence only partially supports the idea that self-esteem buffers against death, however. More complete evidence would consist of showing not only that mortality salience increases defensive reactions and self-serving biases (Solomon, Greenberg, & Pyszczynski, 2004) but also that self-esteem moderates reactions to mortality salience. If self-esteem buffers against the psychological threat of death, then people with high self-esteem should be less defensive in response to mortality salience than are people with low self-esteem.

Consistent with the anxiety-buffering hypothesis of self-esteem is evidence that positive personality feedback ameliorates several responses to mortality salience, including self-reported anxiety (Greenberg, Solomon, et al., 1992), worldview defense (Arndt & Greenberg, 1999), and the tendency to deny the possibility of an early death (Greenberg et al., 1993). Positive personality feedback often increases self-esteem, but little direct evidence exists to support the view that increased self-esteem explains the amelioration of terror management defenses. Some evidence indicates that

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self-affirmation reduces defensiveness and death-thought accessibility after mortality salience (Landau & Greenberg, 2006; Schmeichel & Martens, 2005), but self-affirmation and self-esteem are not synonymous, and evidence suggests that the effects of self-affirmation are not due to changes in (explicit) self-esteem (Schmeichel & Martens, 2005). Thus, although most of the evidence provides reason to conclude that self-esteem moderates reactions to mortality salience, this conclusion may be questioned because most of the previous research has not afforded a direct test of the anxiety-buffering hypothesis.

The few studies that have directly examined whether self-esteem moderates mortality salience effects have produced contradictory findings. We identified six studies in which mortality salience caused defensive reactions primarily among participants lower in explicit self-esteem (Gailliot, Schmeichel, & Maner, 2007; Goldenberg & Shackelford, 2005; Greenberg et al., 1993; Harmon-Jones et al., 1997; Kashima, Halloran, Yuki, & Kashima, 2004; Taubman-Ben-Ari & Findler, 2005), consistent with the anxiety-buffering hypothesis. We found another six studies, however, that observed the opposite pattern, whereby mortality salience produced defensive reactions primarily among participants higher in explicit self-esteem (Baldwin & Wesley, 1996; Landau & Greenberg, 2006; McGregor, Gailliot, Vazquez, & Nash, 2007; Taubman-Ben-Ari & Findler, 2006).

In summary, the anxiety-buffering hypothesis of self-esteem as proposed by TMT has received some support, but in fact some evidence has directly contradicted the anxiety-buffering view. Therefore, it appears as though a major pillar of TMT rests on an uncertain foundation. Might this pillar of TMT require revision?

### Alternative Types of Self-Esteem Examined in the Current Work

We believe the anxiety-buffering hypothesis of self-esteem proposed by TMT is generally correct, but it is crucial to consider the type of self-esteem that is examined. One type of self-esteem is explicit self-esteem, which reflects conscious evaluations of the self. Another type of self-esteem is implicit self-esteem, which is relatively inaccessible to conscious awareness and distinct from explicit self-esteem (Gailliot & Schmeichel, 2006; Greenwald & Banaji, 1995; Hetts & Pelham, 2001; Hetts, Sakoma, & Pelham, 1999; cf. Nosek & Smyth, 2007). Prior theorizing concerning the role of self-esteem in TMT seems to have invoked a sort of experiential or gut-level self-esteem (e.g., see Pyszczynski et al., 2004), whereas researchers have tended to focus on self-reported explicit self-esteem, which is prone to self-presentational biases and cognitive distortion (e.g., Baumeister, Tice, & Hutton, 1989). Implicit self-esteem is relatively less prone to self-presentational biases and therefore may reflect a less distorted evaluation of self (Greenwald & Banaji, 1995; cf. Olson, Fazio, & Hermann, 2007). High implicit self-esteem may be more likely than high explicit self-esteem to buffer the effects of mortality salience because high implicit self-esteem represents a more automatic or spontaneous positive self-evaluation. To provide a strong, direct test of the anxiety-buffering hypothesis, we examined how both implicit and explicit forms of self-esteem influence reactions to mortality salience.

Indirect evidence supports the idea that implicit self-esteem buffers against the psychological threat of death. For instance,

self-affirmation (thinking about one's cherished values) alters how individuals react to mortality salience (Landau & Greenberg, 2006; Schmeichel & Martens, 2005). Self-affirmation has been shown to increase implicit but not explicit self-esteem (Koole, Smeets, van Knippenberg, & Dijksterhuis, 1999), and so it is possible that self-affirmation alters responses to mortality salience by increasing implicit self-esteem. We therefore predicted that high (vs. low) implicit self-esteem would moderate responses to mortality salience by making them less defensive.

As discussed above, past work has revealed conflicting results concerning the relationship between explicit self-esteem and reactions to mortality salience. We expected—on the basis of previous evidence suggesting that high explicit self-esteem, in combination with low implicit self-esteem, reflects inner insecurity and a predisposition toward defensiveness, rather than a soothing entrenchment in society (e.g., Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003; McGregor & Marigold, 2003; Ziegler-Hill, 2006)—that high explicit self-esteem, especially in conjunction with low implicit self-esteem, would predispose individuals to react defensively to the thought of their own death.

In the present research, Study 1 assessed whether mortality salience causes most worldview defense among individuals with low scores on a measure of dispositional implicit self-esteem that was based on participants' fondness for the letters in their own names (Nuttin, 1985, 1987). Study 2 assessed whether an experimental manipulation to boost implicit self-esteem decreases worldview defense after mortality salience. Study 3 assessed whether preferences for positive personality feedback following mortality salience are most evident among participants with the combination of high explicit self-esteem and low implicit self-esteem, as assessed by an implicit association test (IAT; Greenwald & Farnham, 2000).

### Study 1

Study 1 tested the hypothesis that mortality salience increases defensiveness among individuals with relatively low implicit self-esteem. Participants wrote about either death or a control topic (dental pain) and then had the opportunity to engage in worldview defense by evaluating a pro-U.S. and an anti-U.S. essay and their authors. Bias in favor of the pro-U.S. essay and author over the anti-U.S. essay and author was taken to indicate greater worldview defense. We predicted that, consistent with TMT, participants who wrote about death would exhibit increased worldview defense, compared with participants who wrote about dental pain. However, we predicted that this effect would be most pronounced among individuals lower in implicit self-esteem.

### Method

**Participants.** One hundred fifty-seven undergraduate students (112 women) enrolled in an introductory psychology course satisfied a course requirement by participating. Participants were run in a classroom setting and were randomly assigned to either a mortality salience or dental pain condition.

**Procedure.** Participants completed the name-letter-ratings measure of implicit self-esteem (Nuttin, 1985) at the beginning of the semester. Specifically, participants rated the attractiveness of each of the 26 letters in the English alphabet on a scale from 1 (*not*

at all beautiful) to 7 (extremely beautiful). Implicit self-esteem levels were derived from the extent to which participants rated the letters in their own initials as being attractive, while controlling for baseline ratings of those letters (i.e., ratings made by participants whose initials did not contain those letters; see Kitayama & Karasawa, 1997; Koole, Dijksterhuis, & van Knippenberg, 2001).

Approximately 3 weeks later, participants reported to a laboratory to complete the main phase of the experiment. Participants received a packet that contained written instructions and all the relevant materials for the study, and they worked through the packet at their own pace (except for a timed filler task; see below).

Participants first completed the mortality salience induction. Participants in the mortality salience condition described the emotions that the thought of their own death aroused in them and what would happen to them as they physically died. Participants in the dental pain condition answered parallel questions about dental pain.

Next, participants completed the Brief Mood Introspection Scale (BMIS; Mayer & Gaschke, 1988) as a measure of mood valence and arousal. Afterward, participants worked on a filler task for 5 min (either completing a crossword puzzle or filling out additional questionnaires) because the effects of the mortality salience induction on worldview defense are strongest after a brief delay (Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994; Pyszczynski, Greenberg, & Solomon, 1999). Type of filler task did not influence the results.

Last, participants completed a measure of worldview defense. Specifically, participants read two handwritten essays about the United States that were ostensibly composed by two foreigners (materials from Greenberg, Simon, Pyszczynski, Solomon, & Chatel, 1992). The order of the two essays was counterbalanced across participants. One essay was pro-U.S. and praised Americans, whereas the other essay was anti-U.S. and criticized Americans. Participants evaluated the truth and validity of the essays and the likeability, intelligence, and knowledgeability of each essay's author on 9-point scales. The summed evaluations for each essay served as the measures of favorability toward worldview-consistent and worldview-inconsistent opinions, respectively. In accord with past research (e.g., Greenberg et al., 1994), *worldview defense* was defined as the difference between these two measures. Larger differences indicated greater worldview defense. Participants were then thanked and debriefed.

## Results and Discussion

*Implicit self-esteem and worldview defense.* Worldview defense was regressed on mortality salience condition, implicit self-esteem scores, and their centered interaction. Results revealed the predicted interaction between mortality salience condition and implicit self-esteem ( $\beta = -.33$ ,  $t(153) = -3.27$ ,  $p < .01$ ). To decompose the interaction, we assessed the simple effect of mortality salience among participants who were relatively high versus relatively low in implicit self-esteem (1 *SD* above and below the mean, respectively; Aiken & West, 1991; see Figure 1). Results indicated that mortality salience increased the difference between evaluations of the pro- and anti-U.S. essays among participants low in implicit self-esteem ( $\beta = .35$ ,  $t = 3.35$ ,  $p < .01$ ), but not among participants high in implicit self-esteem ( $\beta = -.12$ ,  $p =$

.25). Thus, mortality salience triggered worldview defense primarily among participants low in implicit self-esteem.<sup>1</sup>

Higher implicit self-esteem was associated with lower worldview defense scores in the mortality salience condition,  $r(77) = -.32$ ,  $p < .05$ . In the dental pain condition, higher implicit self-esteem was associated with higher worldview defense scores,  $r(80) = .24$ ,  $p < .05$ . Together, these results suggest that participants lower in implicit self-esteem fortified their worldviews in response to threat, whereas those higher in implicit self-esteem endorsed positive worldview beliefs in a nondefensive manner (i.e., in the absence of threat).

*Mood and arousal.* Analyses indicated that the obtained pattern of results was not attributable to mood valence or arousal. For instance, the interaction between implicit self-esteem and mortality salience in predicting worldview defense remained significant when controlling for mood and arousal.

## Study 2

Study 1 indicated that mortality salience increases worldview defense primarily among people with lower implicit self-esteem. To provide converging evidence for the role of implicit self-esteem, Study 2 tested the hypothesis that an intervention to boost implicit self-esteem attenuates the effect of mortality salience on worldview defense. By experimentally manipulating implicit self-esteem in Study 2, we minimized the impact of potential third variables that influence measures of implicit self-esteem and afforded ourselves the opportunity to find causal evidence that implicit self-esteem reduces mortality salience effects.

In the implicit self-esteem boost condition, participants saw the word *I* presented subliminally on a computer screen immediately prior to the presentation of positive traits (e.g., *handsome*, *smart*). In this fashion, participants were led to associate the positive traits with themselves (De Houwer, Thomas, & Baeyens, 2001; Riketta & Dauenheimer, 2003). Past research has verified that this and similar procedures do indeed increase implicit self-esteem (Bacchus, Baldwin, & Packer, 2004; Dijksterhuis, 2004). Participants in the no-boost control condition saw the same positive traits, but the traits were not preceded by the word *I*. Hence, these participants viewed the positive traits but were not led to associate the traits with themselves, and therefore their implicit self-esteem should not have changed.

Following the mortality salience induction and the implicit self-esteem manipulation, participants responded to the same essays used in Study 1 as a measure of worldview defense. We predicted that mortality salience would increase worldview defense unless participants received a boost to their implicit self-esteem, consistent with the idea that high implicit self-esteem attenuates defensive reactions to mortality salience.

<sup>1</sup> We also analyzed responses to the pro-U.S. essay and the anti-U.S. essay separately. The predicted interaction between mortality salience condition and implicit self-esteem was not significant for evaluations of the pro-U.S. essay ( $\beta = -.11$ ,  $t < 1$ ) or for evaluations of the anti-U.S. essay ( $\beta = .20$ ,  $t(153) = 1.77$ ,  $p = .09$ ). Thus, although higher implicit self-esteem was associated with slightly less positive evaluations of the pro-U.S. essay and somewhat more positive evaluations of the anti-U.S. essay following mortality salience, only the difference score yielded the predicted interaction between mortality salience and implicit self-esteem.

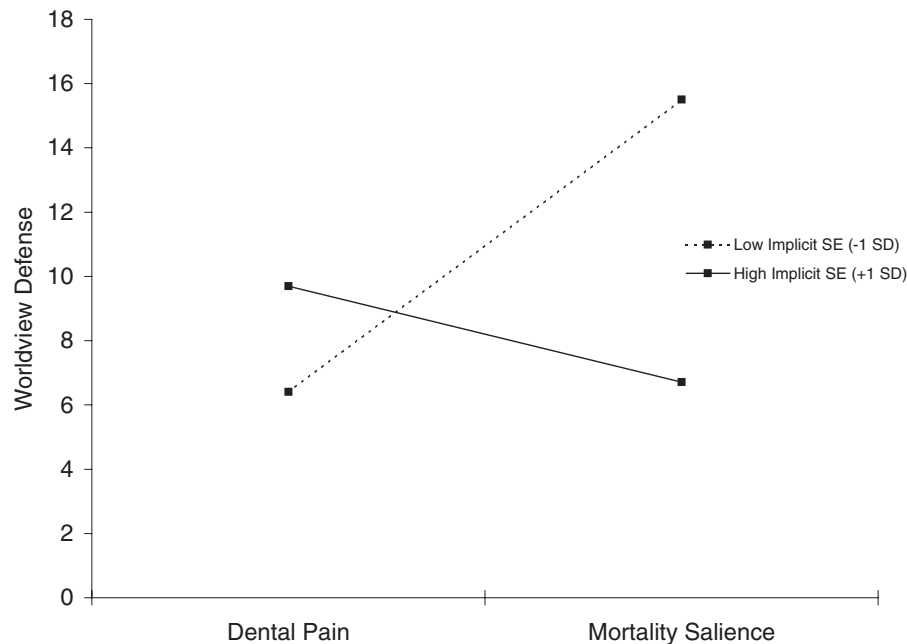


Figure 1. Worldview defense as a function of mortality salience condition and implicit self-esteem (Study 1).

## Method

**Participants.** Ninety-two undergraduate students (58 women) earned credit toward a course requirement by participating. Participants were run individually and were randomly assigned to condition in a 2 (mortality salience vs. dental pain)  $\times$  2 (implicit self-esteem boost vs. no boost) between-subjects factorial design.

**Procedure.** After providing basic demographic information, participants wrote about their own death or dental pain. The next task constituted the manipulation of implicit self-esteem, adapted from Dijksterhuis (2004). Specifically, participants completed a lexical decision task on the computer. The task proceeded as follows: First, a row of Xs appeared in the center of a computer screen for 500 ms. The row was immediately followed by the presentation of the word *I* or the letter *X* presented for 17 ms. The word or letter was immediately followed by the presentation of 1 of 15 positive words (e.g., *nice*, *healthy*) or 1 of 15 random letter strings. Here, participants were to indicate as quickly as possible whether the stimulus was a word or nonword by pressing one of two computer keys.

For participants in the boost condition, the word *I* preceded the presentation of all positive words, and the letter *X* preceded the presentation of all random letter strings. For participants in the no-boost condition, the letter *X* preceded the presentation of all positive words and random letter strings.

Next, participants completed the measure of worldview defense by rating the same pro-U.S. and anti-U.S. essays used in Study 1 (the order of which was counterbalanced across participants). After rating the essays, participants proceeded to complete the letter-rating task used in Study 1 (Nuttin, 1985) so that we could assess the effectiveness of the implicit self-esteem manipulation.

Last, participants were probed for suspicion, thanked, and debriefed. Two participants reported being suspicious of the possi-

bility that subliminal primes were presented during the lexical decision task (i.e., implicit self-esteem boost). Data from these 2 participants were excluded from all analyses, leaving a final sample of 90 students.

## Results and Discussion

**Manipulation check.** Analyses indicated that the subliminal boost of implicit self-esteem did indeed increase implicit self-esteem. A 2 (mortality salience vs. dental pain)  $\times$  2 (boost vs. no boost) analysis of variance (ANOVA) indicated the predicted main effect of boost condition,  $F(1, 86) = 3.74$ ,  $p < .05$  (one-tailed). Participants in the boost condition rated the letters in their initials (controlling for baseline ratings of those letters) higher ( $M = 1.25$ ,  $SD = 1.40$ ) than did participants in the no-boost condition ( $M = 0.64$ ,  $SD = 1.53$ ). None of the other effects approached significance ( $F_s < 1$ ).

**Implicit self-esteem and worldview defense.** We predicted and confirmed that an implicit self-esteem boost reduces worldview defense following mortality salience. A 2  $\times$  2 ANOVA on worldview defense scores revealed a significant interaction between mortality salience condition and boost condition,  $F(1, 86) = 4.65$ ,  $p < .05$ . Simple effects tests revealed that, under mortality salience, participants who received an implicit self-esteem boost exhibited a smaller difference between their evaluations of the pro-U.S. and anti-U.S. essays than did participants in the no-boost condition,  $F(1, 86) = 7.86$ ,  $p < .01$ . In the absence of mortality salience, however, the boost manipulation did not reliably alter essay evaluations ( $F < 1$ ; see Figure 2). Looked at another way, the simple effect of mortality salience condition approached significance in the no-boost condition,  $F(1, 86) = 2.06$ ,  $p = .16$ , but was significant and in the opposite direction in the implicit self-esteem boost condition,  $F(1, 86) = -3.95$ ,  $p = .05$ . Thus, world-



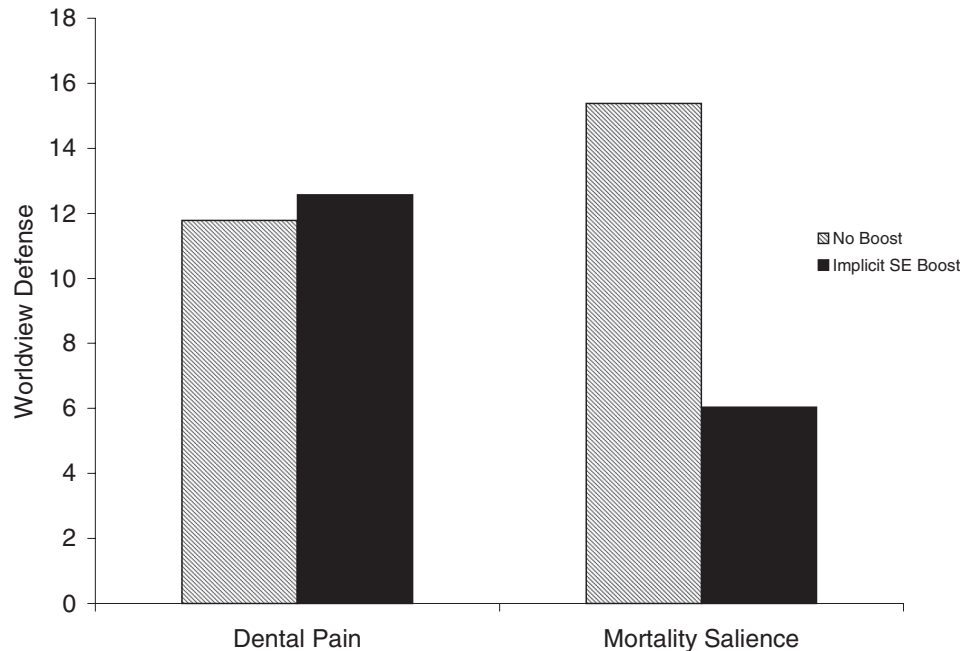


Figure 2. Worldview defense as a function of mortality salience condition and implicit self-esteem boost condition (Study 2).

view defense was reduced by a temporary boost in implicit self-esteem. Implicit self-esteem appeared to provide a buffer against the threat of death, thereby attenuating defensiveness.<sup>2</sup>

### Study 3

In Study 3, we tested the hypothesis that implicit and explicit self-esteem combine to influence reactions to mortality salience. Research has indicated that people with low implicit but high explicit self-esteem are particularly biased in their self-evaluations (e.g., Bosson, Brown, Zeigler-Hill, & Swann, 2003; Zeigler-Hill, 2006) and tend to respond to psychological threats in a defensive and self-serving manner (McGregor & Marigold, 2003, Study 3; McGregor, Nail, Marigold, & Kang, 2005, Study 1). Accordingly, we predicted that mortality salience would have its most pronounced effects among participants with low implicit and high explicit self-esteem.

To provide converging evidence through multiple methods, we used a different measure of implicit self-esteem from that used in the previous studies, namely an IAT that measured participants' speed in associating the self with pleasant versus unpleasant words (Greenwald & Farnham, 2000). Study 3 also used a different dependent measure, namely the tendency to prefer highly positive views of self. Research by Dechesne et al. (2003) found that mortality salience increases participants' judgments of the accuracy and validity of highly positive personality feedback. We predicted that mortality salience would increase endorsement of a positive personality profile primarily among participants with low implicit and high explicit self-esteem. We also sought to extend the results of Dechesne et al. (2003) by asking participants to judge the accuracy and validity of negative personality feedback. Including both positive and negative personality profiles allowed us to assess

whether mortality salience mainly promotes acceptance of positive self-views, rejection of negative self-views, or a combination of both of these.

### Method

**Participants.** Eighty Canadian undergraduates (52 women) participated in exchange for either Can\$5 or credit toward their introductory psychology course.

**Procedure.** Participants were run individually and told the study examined personality. Participants completed all measures (except the word-stem completion task; see below) on a computer.

First, participants completed an IAT as a measure of implicit self-esteem (Greenwald & Farnham, 2000; adapted by Jordan et al., 2003). This version of the IAT required participants to categorize words as either being related to or not being related to the self and as being either pleasant or unpleasant by pressing one of two computer keys. After practice trials, a critical block of trials required participants to use one key to categorize words as related to self or pleasant and another key to categorize words as not related to self or not pleasant. Then the associations were reversed, and participants were required to categorize words as either related to self or unpleasant with one key and to categorize words as either not related to self or pleasant with another key (i.e., the pairings

<sup>2</sup> We again analyzed responses to the pro-U.S. essay and the anti-U.S. essays separately. The predicted interaction between mortality salience condition and implicit self-esteem boost condition was not significant for evaluations of the pro-U.S. essay,  $F(1, 86) = 3.26, p = .08$ , or for evaluations of the anti-U.S. essay,  $F(1, 86) = 2, p = .16$ . As in Study 1, worldview defense was most evident when the pro-worldview and anti-worldview evaluations were considered in tandem.

were reversed). The difference in reaction times between the two critical blocks was used to determine implicit self-esteem. Higher implicit self-esteem was indicated by faster categorizations when self was paired with pleasant rather than when self was paired with unpleasant.

After finishing the IAT, participants completed the Rosenberg Self-Esteem Scale (Rosenberg, 1965) as a measure of explicit self-esteem. The observed correlation between implicit self-esteem and explicit self-esteem was  $r(80) = -.08, p = .47$ . Next was the mortality salience induction. Participants randomly assigned to the mortality salience condition described the emotions that the thought of their own death aroused in them, what they thought would happen to them as they physically died, and what their death would mean in terms of being separated from loved ones. Participants randomly assigned to the control condition responded to parallel questions about the hypothetical scenario of moving away from their friends and family members.<sup>3</sup>

Participants then completed filler questionnaires to provide the required delay following the mortality salience induction and to lend credence to the cover story that the purpose of the study was to validate a new personality assessment technique. Embedded in the filler questionnaires was a word stem completion task, intended to assess death-thought accessibility (adapted from Greenberg et al., 1994). In this task, 5 of the 20 words could be completed with words related to death (e.g., COFF\_ \_ could be completed as either COFFIN or COFFEE). More death-related completions indicated greater death-thought accessibility (Arndt, Greenberg, Solomon, Pyszczynski, & Simon, 1997).

After completing the filler questionnaires, participants completed the dependent measure (adapted from Dechesne et al., 2003). Specifically, they rated counterbalanced personality descriptions on the extent to which each description was accurate, relevant, and complete in describing their own personality, using scales from 1 (*not applicable*) to 9 (*very applicable*). One personality profile described a glowingly positive personality, as follows:

People with this personality profile are generally liked by others. Your willingness to consider the needs of others is highly commended. This quality will ultimately bring you satisfactory involvement in intimate relations and make you attractive to many.

The other profile described a negative personality, as follows:

People with this personality profile are not generally liked by others. Your disregard for the needs of others stands in the way of your being popular. Your thoughtlessness creates difficulty within intimate relationships and makes you unattractive to many.

Composite scores for ratings of the positive and the negative profiles were created by averaging the three items for each profile ( $\alpha = .88$  and  $.93$ , respectively). Participants were thanked and debriefed after they rated the personality profiles.

## Results and Discussion

**Death-thought accessibility.** Participants in the mortality salience condition included more death-related words ( $M = 2.06$ ,  $SD = 1.05$ ) in their word-stem completions than did participants in the control condition ( $M = 1.29$ ,  $SD = 1.09$ ),  $t(64) = 2.92, p < .01$ . Regression analyses indicated that this effect was not moder-

ated by implicit self-esteem, explicit self-esteem, or their higher-order interactions.

**Personality profile endorsement.** Two separate regression analyses were conducted with participant endorsement of the positive and negative personality profiles as dependent variables. Mortality salience condition, implicit self-esteem, and explicit self-esteem, along with their two- and three-way centered interactions, were included as predictors.

With degree of endorsement of the positive profile as the dependent variable, there was a significant three-way interaction between condition, implicit self-esteem, and explicit self-esteem ( $\beta = -.35$ ),  $t(72) = -2.91, p < .01$  (see Figure 3). Simple effects analyses indicated that participants with the combination of high explicit and low implicit self-esteem were more accepting of the positive profile in the mortality salience condition compared with the control condition ( $\beta = .61, p < .05$ ). This simple effect of condition was not significant for any other combinations of implicit and explicit self-esteem, though we did find a nonsignificant trend such that mortality salience decreased endorsement of the positive profile among participants with low explicit and low implicit self-esteem ( $p = .08$ ). Note that, in the absence of terror management defenses, we would expect all slopes depicted in Figure 3 to be flat, with mean-level differences in self-esteem such that high self-esteem individuals endorse the positive personality evaluation more compared with low self-esteem individuals. As can be seen in the figure, the only slope that is not flat is the slope for the low implicit, high explicit self-esteem group. These results support the hypothesis that mortality salience increases esteem-enhancing responses primarily among participants with low implicit and high explicit self-esteem.

With degree of endorsement of the negative personality profile as the dependent variable, we observed main effects for only explicit self-esteem ( $\beta = -.33$ ),  $t(72) = -2.87, p < .01$ , and implicit self-esteem ( $\beta = -.25$ ),  $t(72) = -2.26, p < .05$ , respectively. Participants with high self-esteem (explicit or implicit) were less accepting of the negative personality profile than were their low self-esteem counterparts (Shrauger & Lund, 1975; Stotland, Thorley, Thomas, Cohen, & Zander, 1957). There was no main effect for condition, and there were no significant interactions ( $ts < 1.8$ ). Thus, participants' ratings of the negative profile neither confirmed nor disconfirmed the hypothesis that mortality salience increases rejection of negative feedback among individuals with low implicit and high explicit self-esteem, because mortality salience did not influence endorsements of the negative profile. The finding that some participants embraced more positive self-views following mortality salience but did not reject negative self-views is consistent with evidence that mortality salience primarily increases liking for and attention to positive information (e.g., Dechesne et al., 2003; DeWall & Baumeister, 2007; Hart, Shaver, & Goldenberg, 2005; cf. McGregor et al., 2007).

<sup>3</sup> In past research, a similar separation manipulation caused defensive zeal among defensive people. In contrast to the present, relatively impersonal control-condition manipulation, the separation manipulation in the previous study was more personally relevant and included imagery instructions to make it experientially vivid.

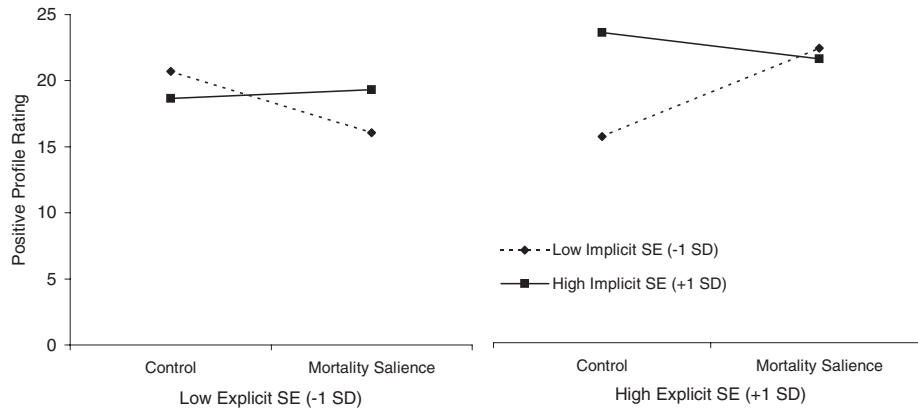


Figure 3. Positive personality ratings as a function of mortality salience condition, implicit self-esteem, and explicit self-esteem (Study 3).

### General Discussion

One core tenet of TMT posits that self-esteem buffers against death-related anxiety, such that people with relatively low self-esteem are predisposed to respond defensively to mortality salience. Despite the intriguing nature of this hypothesis, extant evidence has provided only indirect evidence to support it, and more direct tests have yielded contradictory findings. The current work provides encouraging, novel support for the anxiety-buffering role of self-esteem. Specifically, Studies 1–3 demonstrated that high implicit self-esteem is associated with attenuated reactions to mortality salience. Study 3 clarified the role of explicit self-esteem by demonstrating increased preference for positive feedback in response to mortality salience among participants with the combination of high explicit and low implicit self-esteem. We therefore conclude that self-esteem does indeed help to attenuate terror management defenses but that not all forms of self-esteem are equal in this respect. High explicit self-esteem by itself did not alter the impact of mortality salience, but high explicit self-esteem did intensify the impact of that threat when the high explicit was combined with low implicit self-esteem.

Our findings regarding implicit self-esteem are consistent with other evidence indicating that positive self-evaluations at an implicit or spontaneous level protect people from threats other than mortality salience. For instance, compared with low implicit self-esteem, high implicit self-esteem has been linked to less defensiveness in response to negative feedback (Dijksterhuis, 2004; Greenwald & Farnham, 2000), interpersonal stressors (Spalding & Hardin, 1999), feelings of uncertainty (McGregor & Marigold, 2003), cognitive dissonance (Jordan et al., 2003), and academic failure (McGregor & Jordan, 2007; McGregor et al., 2005). Thus, compared with low implicit self-esteem, high implicit self-esteem appears to confer resilience in the face of psychological threats.

The present findings on implicit self-esteem are consistent with other theorizing, as well as work on TMT. Many psychological defenses operate outside of consciousness—and so does implicit self-esteem. The ubiquitous power of unconscious defense mechanisms was asserted on theoretical and clinically observational grounds by Freud (1933) and has been confirmed in recent empirical work on mortality salience. For instance, worldview defense reduces the salience of death concepts (Arndt et al., 1997), al-

though people seem consciously unaware of engaging in worldview defense and its relationship to death (Pyszczynski et al., 1999). Death thoughts are often denied or suppressed without conscious intent, and individuals are often unaware of their level of death anxiety (e.g., Feifel & Branscomb, 1973; Pollak, 1979–1980). Likewise, terror management defenses are particularly likely to occur when the unconscious or implicit activation of death is high yet explicit awareness of death is low (Arndt et al., 1997).

If the threat of death often exerts its influence at an implicit or unconscious level, then the implicit or unconscious aspect of self-esteem may be crucial in guiding reactions to death (see Hetts & Pelham, 2001, for a similar argument). Instead of engaging in a rational, conscious defense against death (e.g., “I am a successful and respected member of society, and therefore I shall enjoy a symbolic immortality that transcends death”), people may be far more likely to engage in an implicit, perhaps irrational, reaction to death in order to diminish its threatening nature (e.g., by derogating an outgroup or overestimating the degree to which others agree with one’s opinions; Pyszczynski et al., 1999; see Simon et al., 1997).

Our finding that high explicit self-esteem, in combination with low implicit self-esteem, was associated with responding to mortality salience is consistent with past work demonstrating heightened reactions to mortality salience among individuals with high explicit self-esteem (Baldwin & Wesley, 1996; Landau & Greenberg, 2006; McGregor et al., 2007; Taubman-Ben-Ari & Findler, 2006). This finding is inconsistent, however, with evidence linking low explicit self-esteem to such reactions (Gailliot et al., 2007; Goldenberg & Shackelford, 2005; Harmon-Jones et al., 1997; Kashima et al., 2004; Taubman-Ben-Ari & Findler, 2005).

If high rather than low explicit self-esteem truly is linked with defensiveness following mortality salience, then why have other studies found the opposite? We suspect that Harmon-Jones et al. (1997) may have produced discrepant findings because they sampled only participants with stable self-esteem (i.e., similar self-esteem scores between an initial mass-testing session and a later session), which likely could have reduced defensiveness among participants with high self-esteem (see Kernis, 1993; Kernis, Cornell, Sun, Berry, & Harlow, 1993; Kernis, Grannemann, & Bar-

clay, 1989). Other studies may have found more defensive reactions among participants with low rather than high explicit self-esteem because the measures of defensiveness were differentially relevant to participants with high and low explicit self-esteem. For instance, mortality salience increased the tendency to distance the self from the body among participants with low explicit self-esteem (Goldenberg & Shackelford, 2005). It is plausible that such reactions did not occur among participants with high explicit self-esteem because they generally view themselves more favorably than do those with low explicit self-esteem (see Baumeister, Campbell, Krueger, & Vohs, 2003) and hence may not find solace in distancing themselves from their physical body.

Another explanation is that there are different types of defenses to mortality salience, and the current work examined mainly assertive, self-promoting reactions that people with high explicit self-esteem are more likely to engage in (e.g., Vohs & Heatherton, 2001). People with low explicit self-esteem may be more likely to engage in less assertive, more prevention-focused or self-protective defenses (e.g., Spalding & Hardin, 1999; see Baumeister, 1993). A third, somewhat related explanation is that evidence linking low explicit self-esteem to defensive responses actually reflects the influence of self-control rather than self-esteem. Evidence suggests that low self-control (both trait and state) contributes to defensiveness in response to mortality salience (Gailliot, Schmeichel, & Baumeister, 2006). Low self-control is associated with low self-esteem (Tangney, Baumeister, & Boone, 2004), and some evidence suggests that the influence of self-control surpasses the influence of explicit self-esteem in shaping reactions to mortality salience (Gailliot et al., 2007).

A fourth factor that may account for the inconsistent results with explicit self-esteem in past research is that seemingly subtle methodological factors, such as whether experimenters are wearing lab coats or T-shirts, can crucially affect the mind-sets and thereby the reactions of participants. Research has found that mortality salience effects are most pronounced when experiments are conducted in an atmosphere that fosters an experiential versus a rational mind-set (Simon et al., 1997). Experiential mind-set inductions appear to increase the salience of implicit self-esteem, bringing more rationally mediated explicit self-evaluations in line with implicit self-evaluations (Jordan, Whitfield, & Zeigler-Hill, 2007). Thus, explicit self-esteem may augment mortality salience reactions when participants are in a rational mind-set, whereas experiential mind-sets may increase coherence between explicit and implicit self-esteem, producing attenuated responses to mortality salience. We hope that future work will further clarify the role of self-esteem in terror management by focusing on implicit, in addition to explicit, self-esteem.

It is important to note that we did not assess immediate reactions to mortality salience but instead only delayed reactions (though delayed by only a few minutes). Immediately after thinking about death, people tend to defend against death thoughts by rationally and consciously denying the likelihood of their dying (e.g., "I will not die young because I exercise regularly!"); Pyszczynski et al., 1999). Other defensive processes such as those in the present research often require a delay period to emerge (Arndt et al., 1997). Our conclusion that implicit self-esteem reduces the effects of mortality salience is at present applicable only to delayed and not immediate reactions to death. To be sure, nonconscious or delayed reactions may be more common, given that people might

confront implicit reminders of death (e.g., the elderly; Martens, Greenberg, Schimel, & Landau, 2004) more often than explicit reminders (e.g., the death of friends or family). We also did not address other consequential aspects of psychological confrontations with mortality, such as the duration for which participants pondered their death. Research has indicated that more extended considerations of personal mortality are associated with less defensive reactions (Lykins, Segerstrom, Averill, Evans, & Kemeny, 2007).

In any case, our finding that mortality salience increased defensive responding among individuals with both high explicit and low implicit self-esteem is consistent with prior theory and empirical evidence. Theorists have long noted that vulnerable individuals (such as those with high explicit and low implicit self-esteem in the current study) respond to self-threats with proud and zealous reactions (Adorno, Frenkel-Brunswick, Levinson, & Sanford, 1950; Fromm, 1941; Horney, 1950; James, 1902). Likewise, individuals with the combination of high explicit self-esteem and low implicit self-esteem have been found to respond defensively to threats other than mortality salience (Jordan, Spencer, & Zanna, 2005; Jordan et al., 2003, Study 3; McGregor & Jordan, 2007; McGregor & Marigold, 2003). When reality poses a threat to the self-concept, the insecurely concealed appear to soothe themselves by clinging to sources of conviction and pride.

Many psychologists and social policy makers have embraced the idea that high self-esteem has important and powerfully adaptive value, even to the extent that they have advocated boosting self-esteem throughout the population (e.g., California Task Force to Promote Self-Esteem and Personal and Social Responsibility, 1990). The ostensible benefits of self-esteem have become controversial, with fairly strong arguments on both sides, especially in relation to its impact on aggression and antisocial behavior (Baumeister, Smart, & Boden, 1996; Boden, Fergusson, Horwood, 2007, 2008; Bushman et al., in press; Donnellan, Trzesniewski, Robins, Moffitt, & Caspi, 2005; Swann, Chang-Schneider, & McClarty, 2007; Twenge, 2006). A review of effects on coping with stressors by Baumeister et al. (2003) found a perplexing pattern of inconsistent results—yet there was consistency in one respect, which was that when high self-esteem did yield results, they tended to be positive. That review also pointed to the heavy reliance on self-report as a source of bias and inconsistency in the results. The present findings may suggest a way forward out of controversy and inconsistency. High implicit self-esteem does emerge from the present studies as a valuable resource for coping. Implicit self-esteem, of course, is less subject to self-report biases and other distortions than is explicit self-esteem. Meanwhile, explicit self-esteem remains a source of inconsistent findings as a predictor of responses to stress, with mortality salience as with the more traditional stressors reviewed by Baumeister et al. (2003). The combination of implicit and explicit measures may hold some hope for reducing those inconsistencies, insofar as the combination of high explicit plus low implicit self-esteem has now been shown to predict higher vulnerability and reactivity to threat than any other combination of implicit and explicit levels of self-esteem.

### *Concluding Remarks*

One of the more interesting aspects of TMT is its counterintuitive nature. It is surprising that simple reminders of mortality



produce strong biases in how people view themselves and others. Perhaps due to their avoidance or suppression of death-related thoughts, many people may not see the fear of death as a powerful motivator. Equally counterintuitive is one cornerstone of TMT, namely the idea that self-esteem operates, at least in part, to defend against death anxiety (Pyszczynski et al., 2004). The current work provides direct evidence for this cornerstone and highlights implicit self-esteem in particular as a source of resilience in the psychological encounter with mortality.

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