

## The Anxiety-Buffering Function of Close Relationships: Evidence That Relationship Commitment Acts as a Terror Management Mechanism

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Three studies examined the terror management function of romantic commitment. In Study 1 ( $N = 94$ ), making mortality salient led to higher reports of romantic commitment on the Dimensions of Commitment Inventory (J. M. Adams & W. H. Jones, 1997) than control conditions. In Study 2 ( $N = 60$ ), the contextual salience of thoughts about romantic commitment reduced the effects of mortality salience on judgments of social transgressions. In Study 3 ( $N = 100$ ), the induction of thoughts about problems in romantic relationships led to higher accessibility of death-related thoughts than did the induction of thoughts about either academic problems or a neutral theme. The findings expand terror management theory, emphasizing the anxiety-buffering function of close relationships.

More than a decade of research on terror management theory (TMT; see Pyszczynski, Greenberg, & Solomon, 1999, for a recent review) has established its position as an important psychological theory of human social motivations. This theory has unraveled the prominent place mortality concerns play in our daily lives and has highlighted the dramatic effects of death awareness on a variety of behaviors, cognitions, and emotions. An impressive body of empirical evidence suggests that two culturally derived psychological mechanisms are primarily involved in warding off thoughts of personal death: self-esteem enhancement and cultural worldview validation.

Recent empirical studies (e.g., Goldenberg, Pyszczynski, McCoy, Greenberg, & Solomon, 1999; Mikulincer & Florian, 2000) suggested that close relationships may be involved in regulating fear of death. Whereas Goldenberg et al. (1999) found that thoughts about a love relationship buffered the effects of mortality salience on repulsion from the physical aspects of sexual behavior, Mikulincer and Florian (2000) reported that securely attached persons reacted to a mortality salience induction with heightened need for intimacy with a romantic partner. Although these studies provided some initial hints on the possible role that close relationships may play in terror management, they were not originally designed to test the anxiety-buffering function of close relationships, and their findings were circumscribed to sexual behavior and to securely attached persons. Moreover, they did not conceptualize close relationships as a terror management mechanism, develop any theoretical rationale explaining why close relationships serve this defensive function, and systematically test the basic TMT hypotheses within the context of close relationships.

In the present series of studies, we attempted to fill in these gaps and to propose that the formation and maintenance of close relationships may act as an additional terror management mechanism. Accordingly, we intended to develop a comprehensive and systematic research plan examining the implications of close relationships to terror management processes and applying the basic TMT hypotheses to relational strivings, cognitions, and behaviors. In the present studies, we initiated this research plan by examining whether commitment in a romantic relationship serves a defensive function against the terror of death. These studies would provide important knowledge on the psychodynamic antecedents of romantic commitment as well as on its contribution to the process of coping with death concerns. On this basis, we viewed romantic commitment not only as affected by perceived relational costs and benefits (Rusbult, 1980), but we extended its conceptualization as a psychological device aimed at dealing with basic existential threats and needs.

### TMT and Research

TMT is based on the premises that humans, like other living beings, are driven by a self-preservation instinct. However, unlike other organisms, humans are self-conscious and are aware of their own existence. One consequence of this elevated self-awareness is the comprehension of the inevitability of their ultimate death. According to the theory, this inner yearning for life coupled with the painful realization that one must eventually die, places humans in an impossible paradox. Thus, to escape the feelings of helplessness and terror brought about by the inability to avoid the certainty of death, humans have devised elaborate symbolic psychological mechanisms designed to remove the awareness of death from conscious thought.

These symbolic defenses have recently been conceptualized as a dual-process model consisting of proximal and distal defenses (Pyszczynski et al., 1999). The proximal defenses include attempts to suppress thoughts about death or to bias rational inferential

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processes by pushing the problem of death into the distant future. The distal defenses address the problem of death in a more indirect symbolic manner by modifying people's perceptions of themselves and of the world in which they are imbedded. Most TMT studies have focused on two distal defenses. Specifically, they have demonstrated that the terror of death can be managed by either adherence to a cultural worldview or by self-esteem enhancement (Greenberg, Pyszczynski, & Solomon, 1997).

The first terror management mechanism consists of the validation of one's cultural worldview. According to TMT, cultural worldviews are symbolic constructions that imbue the world with meaning and order, provide an explanation to the basic existential questions of life and death, and may offer symbolic protection against the terror of death (Greenberg et al., 1997). As a result, the validation of the cultural worldview may mitigate death concerns and help people deny mortality (Solomon, Greenberg, & Pyszczynski, 1991). The second mechanism consists of cognitive and behavioral efforts aimed at increasing self-esteem, which would provide a symbolic shield against the fear of death (Greenberg et al., 1997). According to TMT, high self-esteem increases a person's sense of meaning, value, and invulnerability, which, in turn, would help to deny his or her own finitude.

These theoretical propositions have been empirically tested according to two hypotheses: the mortality salience hypothesis and the anxiety buffer hypothesis. The mortality salience hypothesis asserts that if a psychological structure serves to buffer individuals from thoughts of their own death, priming individuals with death reminders would increase their reliance on that psychological structure. Studies testing this hypothesis have found that making mortality salient increases the motivation to validate cultural worldviews by avoiding, derogating, punishing, and even aggressing against worldview-threatening others (e.g., Florian & Mikulincer, 1997; Greenberg et al., 1990; McGregor et al., 1998). Furthermore, there is initial evidence that mortality salience inductions increase self-esteem strivings (e.g., Ben-Ari, Florian, & Mikulincer, 1999; Goldenberg, McCoy, Pyszczynski, Greenberg, & Solomon, 2000). These effects appear to be unique to thoughts about death. Other anxiety-producing conditions, such as thinking about giving a speech, intense physical pain, or worries about life after college, do not produce the same defensive reactions as mortality salience (e.g., Greenberg, Simon, Harmon-Jones, Solomon, Pyszczynski, & Lyon, 1995; Greenberg, Pyszczynski, Solomon, Simon, & Breus, 1994).

The anxiety buffer hypothesis suggests that if a psychological mechanism buffers individuals from death anxiety, then the activation of this mechanism under a mortality salience induction should satisfy terror management needs and reduce the need to activate other defensive mechanisms. Several experiments have tested this hypothesis and have found that trait-like measures or experimental inductions of high self-esteem led to lower reports of anxiety in response to aversive or death stimuli (Greenberg et al., 1992; Greenberg, Pyszczynski, Solomon, Pinel, Simon, & Jordan, 1993) and reduced the need to use other cultural defenses, such as out-group derogation under mortality salience conditions (Harmon-Jones, Simon, Greenberg, Pyszczynski, Solomon, & McGregor, 1997).

Recently, some studies have raised the possibility of a third hypothesis that is a derivative of the major cognitive process underlying the awareness of death—the accessibility of death-related thoughts. Originally, terror management studies have found

that the exposure to a mortality salience induction increased the accessibility of death-related thoughts (e.g., Arndt, Greenberg, Pyszczynski, Solomon, & Simon, 1997; Greenberg et al., 1994). It is interesting that this heightened death-thought accessibility seems to depend on the activation of proximal defenses and to be associated with the activation of cultural worldview defenses. Thus, for example, following an explicit mortality salience induction (asking participants to think about their own death), which may have activated proximal defenses (i.e., suppression of death-related thoughts), heightened death-thought accessibility and a concomitant activation of cultural worldview defenses were observed after a delay or distracting task but not immediately after the mortality salience induction (e.g., Greenberg et al., 1994). However, following subliminal death reminders, which did not demand any suppression of death-related thoughts because these thoughts did not reach awareness, heightened death-thought accessibility and cultural worldview defenses were observed immediately after the mortality salience induction (Arndt, Greenberg, Pyszczynski, & Solomon, 1997).

Following this line of research, a series of recent studies have shown that heightened death-thought accessibility may also be obtained by exposing people to stimuli that disrupt terror management mechanisms (Goldenberg et al., 1999). Specifically, they found that inducing people to think about the physical aspects of sex (i.e., the animal side of human nature) raises the accessibility of death-related thoughts, at least among persons scoring high in neuroticism, because this stimulus may prevent the denial of people's finitude as physical beings. In our terms, this finding suggests that if a psychological mechanism is thought to shield people from the awareness of their mortality, threatening the integrity of this mechanism should raise the accessibility of death-related thoughts.

To date, a large body of research supports TMT's contentions concerning the function of cultural worldview defenses against the awareness of death. In this context, TMT research has charted a wide variety of psychological territories that seem to be involved in the management of the terror of death. Thus, for example, worldview defenses against mortality concerns have been manifested in university affiliation (e.g., Dechesne, Janssen, & van Knippenberg, 2000), sport teams affiliation (e.g., Dechesne, Greenberg, Arndt, & Schimel, 2000), political orientation (e.g., McGregor et al., 1998), religious preference (e.g., Greenberg et al., 1990), nationalistic identity (e.g., Greenberg et al., 1994), and social consensus (e.g., Pyszczynski et al., 1996). At the same time, recent conceptualizations of TMT (Pyszczynski et al., 1999) have steered more attention to other psychological processes that may also partake in the defense against the terror of death. For example, Pyszczynski et al. (1999) included the proximal defenses of suppression and rationalization to complement culturally derived defenses. Moreover, research has shown that mortality salience seems to significantly affect escaping from self-awareness (Arndt, Greenberg, Simon, Pyszczynski, & Solomon, 1998), fair-process judgments (Van der Bos & Miedema, 2000), and creativity (Arndt, Greenberg, Solomon, Pyszczynski, & Schimel, 1999). Accordingly, Florian and Mikulincer (1998) found that the sense of symbolic immortality also functions as a terror management mechanism.

Following this line of thought, in the present series of studies, we attempted to chart a new psychological territory in which defenses against death reminders may be manifested—the field of close relationships. Specifically, we attempted to explore the pos-

sible role that close relationships, in general, and romantic commitment, in particular, may play in the management of the terror of death. We were encouraged in this endeavor by findings that thoughts about love relationships buffered mortality salience effects on repulsion from physical aspects of sexual behavior (Goldenberg et al., 1999) and that mortality salience heightened strivings for intimacy in romantic relationships, at least for securely attached persons (Mikulincer & Florian, 2000, Study 5). We were also encouraged by Becker's (1973) theoretical statements, from which a substantial portion of TMT was derived, that tackle an important function of relationships in protecting people from mortality concerns. In Becker's view, with the breakdown of organized religion in Western cultures during the 20th century, romantic relationships emerged as one of the primary social domains through which people may obtain a sense of security and function with relative equanimity in the face of existential concerns (Becker, 1973). On this basis, the main goal of our studies was to examine the possible anxiety-buffering function of close relationships.

### Perspectives on the Functions of Close Relationships

The phenomenon of close relationships is an integral part of human existence. From an evolutionary perspective, the close interpersonal relationships that give rise to the couple and family units have evolved to address basic adaptational problems the human race has been facing from the dawn of history (e.g., Buss & Schmitt, 1993). A similar perspective on the essence of close relationships has been voiced by classic philosophers, such as Aristotle, who believed them to be a fundamental component of human existence (Aristotle, trans. 1982). Modern philosophers, such as Hobbs and Locke, have also observed that close relationships are natural human virtues that are influenced by cultural norms and values but are nevertheless universal in essence. In the past century, in spite of dramatic cultural, political, and social changes, the famous French anthropologist Levi-Strauss (1967) maintained that whereas society belongs to the realm of culture, close interpersonal relations constitute a social expression of basic human needs.

Close relationships seem to be a product of natural selection processes that have survival and reproductive benefits (Buss & Schmitt, 1993). According to this perspective, close relationships contribute to survival of people's genes by enhancing the survival of their offspring. Specifically, the formation of close relationships increases the likelihood of mating and improves the ability to gather food, build shelter, explore the environment, and protect offspring from dangers. That is, a person may be driven to maintain close relationships because human ancestors who were successful in forming close bonds were more likely to reproduce and raise offspring to maturity (Baumeister & Leary, 1995).

In modern psychology, close relationships have been related to a fundamental motivation of belongingness (Baumeister & Leary, 1995). Some of the most prominent personality theorists have emphasized that people are motivated to form and maintain close relationships. For example, Angyal (1943) and Bakan (1966) have developed the terms of *homonomy* or *communion* to express the basic needs of attachment to significant others and the fundamental importance of close interpersonal relationships. Sullivan (1953), Fromm (1955, 1956), Horney (1945), and Bowlby (1969) all have

made similar suggestions and placed the need to form and maintain close relationships as a basic human motivation. Moreover, Maslow (1970) ranked love and belongingness needs as a basic human motivation that takes precedence over esteem and self-actualization needs.

The formation and maintenance of close relationships have been recognized in both infants and adults as an inner resource that functions to regulate distress. One basic statement of Bowlby's (1969) theory is that all human beings are born with an attachment system aimed at maintaining proximity to significant others in times of stress. In Bowlby's terms, proximity maintenance to attachment figures helps the individual deal with stress-inducing events and regulates distress. These figures function as a haven of safety to which the individual can retreat for comfort in times of stress as well as a "secure base" from which he or she can develop his or her personality in a supportive atmosphere. According to Bowlby (1988), the need for attachment is active during the entire life span and is directly manifested in the formation of close relationships.

Close relationships also have been recognized as an important source of self-esteem (e.g., Leary, 1999; Leary & Downs, 1995). Because of the highly adaptive functions of the formation of close bonds, Leary and his colleagues assumed that human ancestors may have developed a psychological mechanism to monitor their success or failure in making and keeping social ties. They suggested that people monitor the degree to which they are valued and accepted by significant others and that one important output of this monitoring is the sense of self-esteem. Specifically, high self-esteem connotes a feeling of being accepted and valued by others, whereas low self-esteem is derived from social rejection and the failure to maintain close bonds. In support of this view, research has shown that self-esteem was significantly reduced when participants were socially excluded on the basis of a meaningful reason (e.g., Leary, Tambor, Terdal, & Downs, 1995).

On this basis, our general assumption was that the formation and maintenance of close relationships may serve as a death-anxiety-buffering mechanism. First, as reviewed earlier, close relationships may actually promote self-preservation and increase the chances for survival, and, then, may symbolically help the individual deny the threat of his or her own death. Second, in line with Bowlby's (1969) theorizing, the distress regulation function of close attachments may also be manifested in coping with the terror of death awareness, thus helping people buffer death concerns. Third, the formation and maintenance of close relationships may be an important source of self-esteem and, thus, may serve as a resource in the encounter with death reminders. In this manner, when faced with the awareness of death, people may be motivated to increase proximity, closeness, intimacy, and commitment to others to mitigate the terror of death.

Our general assumption has important implications for understanding the nature of processes in relationships. These processes may be partially shaped by the existential fear of death as well as by the need to avoid death awareness. As such, they may be contextually affected by external or internal cues that remind people of their own mortality as well as by individual differences in death concerns and ways of coping with these concerns. Accordingly, these relational processes may dynamically interplay with other terror management mechanisms, such as worldview validation and self-esteem enhancement. On this basis, the hypoth-

esized terror management function of close relationships promotes conceptual integrations between interpersonal processes and intrapersonal mechanisms as well as between the field of close relationships and existential psychology.

### The Present Studies

In the present studies, we followed the above assumption and focused on one of the major components of close relationships—relationship commitment. Generally, *commitment* is defined as the desire to maintain a relationship over time (e.g., Johnson, 1991). Numerous models have recognized the central role that commitment may play in the development of close relationships (e.g., Johnson, 1991; Rusbult, 1983). Research has suggested that relationship commitment is associated with a variety of positive psychological outcomes, such as effective communication and problem solving (Robinson & Blanton, 1993), constructive accommodative strategies during interpersonal conflict (Arriaga & Rusbult, 1998), relationship satisfaction (Rusbult & Buunk, 1993), and relationship stability (Kurdek & Schnopp-Wyatt, 1997).

In studying relationship commitment, it is important to take into consideration the multidimensional nature of this psychological construct. Several researchers have referred to commitment in terms of feelings of loyalty, devotion, and dedication to a relationship or partner (e.g., Johnson, 1973, 1991), persistence in the face of adversity (e.g., Lydon & Zanna, 1990), and the rewarding aspects of the relationship (Rusbult, 1980, 1983). However, other researchers have referred to commitment in terms of a sense of moral obligation and sacrifice (e.g., Broderick, 1981; Johnson, 1973).

In an attempt to deal with the diversity of conceptualizations, Adams and Jones (1997) conducted a factor analytic investigation in which they defined and empirically extracted three main components of relationship commitment. The first component—commitment to partner—refers to dedication to, devotion to, and love for a partner and it seems to be closely associated with relationship satisfaction. Although this factor was strongly correlated with measures of love and satisfaction, it was found to be conceptually quite distinct (Adams & Jones, 1997). The second component—the moral factor—refers to the sense of moral obligation and responsibility toward the maintenance of a relationship even when attraction to and love for the partner have diminished. The third component—the constraining factor—refers to fear of the social, financial, or legal consequences of relationship termination. Unlike the two former components that connote personal feelings toward a partner or culturally derived values toward relationships that drive people to increase their commitment, the third component reflects a sense of helplessness and entrapment that does not entail any investment in the relationship.

In the present investigation, we focused on the first two factors of commitment in romantic relationship. Examining commitment to partner and the moral factor of commitment under mortality salience conditions enabled us to assess whether death awareness affects people's sense of personal commitment to a significant other and their normative sense of moral obligation toward their partners.

In examining the anxiety-buffering function of relationship commitment, we also attempted to explore possible individual differences in the activation of this terror management mecha-

nism. Specifically, we focused on the possible moderating role of gender and neuroticism. Although TMT studies generally have not found significant gender differences in mortality salience effects, there is evidence that women and men differ in their attitudes about fear of death (e.g., Florian & Har-Even, 1983; Neimeyer & Van Brunt, 1995). Furthermore, evolutionary psychology thinking on gender differences in short- and long-term mating strategies implies that gender may play an important role in romantic relationship commitment (Buss & Schmitt, 1993). Because of evolutionary selection pressures, women may be more likely to invest in long-term romantic relationships than are men. Therefore, it is possible that relationship commitment would have a stronger anxiety-buffering effect among women than among men because of the central place commitment seems to have in women's worldview.

Another individual-difference factor that seems to be relevant for both reactions to death and close relationships is neuroticism. On the one hand, neuroticism has been found to be positively related to death anxiety (e.g., Loo, 1984; Pollak, 1979; Westman & Brackney, 1990). Recently, Goldenberg et al. (1999) found that neuroticism was positively related to the cognitive accessibility of death-related thought and that it moderated the effects of mortality salience on the appeal of physical aspects of sex. On the other hand, there is accumulative evidence that neuroticism is implicated in the disruption of romantic relationships (Karney & Bradbury, 1995). In fact, Kurdek (1997) found a negative correlation between neuroticism and feelings of romantic commitment. Therefore, it is possible that neuroticism would significantly moderate the impact of mortality salience on relationship commitment.

Keeping these individual differences in mind, we contended that the sense of romantic commitment would serve a terror management function. In our view, romantic commitment entails the possibility of enhancing the ability to reproduce and raise offspring, which, in turn, would be manifested in what Lifton and Olson (1974) called a sense of symbolic immortality. The sense of symbolic immortality involves the belief that some aspects of the self will persevere after one dies, and it has been shown to buffer mortality salience effects (Florian & Mikulincer, 1998). On this basis, we hypothesized that making mortality salient would highlight the significant role of close relationships in one's life and increase the motivation to maintain these relationships over time.

To examine our hypothesis on romantic commitment as a terror management mechanism, we conducted three independent studies. In Study 1, we randomly assigned participants to a mortality salience, physical pain salience, or control condition to examine whether death awareness increases a person's feelings of commitment. In Study 2, we assessed whether thinking about commitment to a relationship following a mortality salience manipulation reduces the need to defend the cultural worldview (judgments of social transgressions). In Study 3, we examined whether participants who were instructed to think about problems in a close relationship compared with those who thought of problems at school or a neutral topic showed higher accessibility of death-related thoughts. This research program would advance our knowledge on the nature of romantic commitment as a psychological device aimed at dealing with death awareness. Moreover, it would provide innovative data on the contextual factors that may increase romantic commitment, the effects of romantic commitment on

attitudes toward other persons and social judgments, and the dynamic interplay between romantic commitment and one's basic existential fears.

### Study 1

In Study 1, we examined the effects of mortality salience on feelings of commitment in a romantic relationship. According to TMT (e.g., Greenberg et al., 1997), if a psychological mechanism buffers thoughts of death, priming individuals with death reminders would increase their reliance on that psychological mechanism. Therefore, if relationship commitment acts as a death-anxiety buffer, one could expect that exposing persons to a mortality salience induction would increase their feelings of relationship commitment. In examining this hypothesis, participants completed a neuroticism scale (Eysenck & Eysenck, 1967) and were randomly divided into three conditions according to the type of thoughts that were made salient. In the mortality salience condition, death-related thoughts were made salient. In the neutral condition, neutral, death-irrelevant thoughts were made salient. In the physical pain condition, thoughts about intense physical pain were made salient. The physical pain condition was used to control for the possibility that the link between mortality salience and relationship commitment is due to global aversive feelings rather than to personal death itself. In this way, we tested whether the link between mortality salience and relationship commitment is unique to thoughts about death. After a delay or distraction task, all the participants completed a shortened version of the Dimensions of Commitment Inventory (Adams & Jones, 1997), in which we tapped the main dependent variable—a person's current feelings of relationship commitment.

### Method

**Participants.** Ninety-four undergraduate students (49 women and 45 men, ranging in age from 19 to 43 years,  $Mdn = 25$ ) from Bar-Ilan University participated in the study without any monetary reward. All the participants were currently involved in a serious heterosexual romantic relationship (relationship duration ranged from 1 year to 16 years,  $Mdn = 3$ ). Forty-one percent of the participants ( $N = 34$ ) were married.<sup>1</sup>

**Materials and procedure.** Participants were invited to participate in a study of personality and social psychology on an individual basis.<sup>2</sup> They were told that they would complete a packet of questionnaires and were instructed to work through the packet at their own pace, while making sure to follow the exact order of the given questionnaires.

Following a brief sociodemographic sheet, participants completed a shortened version of the Neuroticism subscale of the Eysenck Personality Inventory (Eysenck & Eysenck, 1967). Participants read 12 items reflecting neurotic affective reactions (e.g., "I'm a nervous person," "I suffer from guilt feelings"). They rated the extent to which an item was self-descriptive on a 5-point scale ranging from *not at all* (1) to *very much* (5). In our sample, the Cronbach alpha coefficient for the 12 items was .90. On this basis, a total score was computed by averaging the 12 items.

On completing the Neuroticism scale, participants completed a filler social issues survey and then were randomly divided into three conditions according to two open-ended questions aimed at making salient specific thoughts. These questions have been used in previous studies (e.g., Greenberg et al., 1990, 1994, 1995) to remind people of their death, a neutral topic, or intense physical pain. Participants in the mortality salience condition ( $N = 33$ ) received the following items: "Please briefly describe the emotions that the thought of your own death arouses in you" and "What do you think happens to you as you physically die and once you are physically

dead?" Participants in the neutral condition ( $N = 33$ ) were asked parallel questions, replacing all references to death with "watching television." Participants in the physical pain condition ( $N = 28$ ) were asked parallel questions, replacing references to death with "experiencing intense physical pain." In all the three conditions, the questionnaire consisted of two items with space provided below each for one paragraph of response. Statistical analyses revealed that the three conditions did not significantly differ in sociodemographic characteristics (gender, age, relationship duration, marital status) and neuroticism as well as in the length (number of words) of a participant's answer to the probes.

Following the mortality salience manipulation, all the participants completed a 19-item filler-distractor scale on leisure time activities. This scale was included as a distraction task because previous studies have shown that mortality salience effects on distal defenses (e.g., cultural worldview defenses) occur after people have been distracted from death reminders (e.g., Greenberg et al., 1994).

On completion of the above procedure, participants received two subscales of the Dimensions of Commitment Inventory (Adams & Jones, 1997). This scale was constructed to tap the various dimensions of commitment. Following a series of exploratory factor analyses, a 45-item scale was generated that was organized around three dimensions of commitment. Fifteen items tap romantic commitment to partner based on attraction, trust, and love toward the romantic partner (e.g., "I'm completely devoted to my partner," "I want to grow old with my partner"). Fifteen items tap moral commitment to a relationship based on moral-normative obligations and a sense of responsibility for maintaining the relationship (e.g., "Marriages are supposed to last forever," "It is morally wrong to divorce your spouse"). Fifteen items tap a constraining factor based on fear of the costs of ending a relationship (e.g., "I could never leave my partner; I have too much invested on him or her," "My friends would disapprove if I would end my romantic relationship"). This scale was found to be highly reliable and valid (Adams & Jones, 1997).

In the present study, we assessed the Commitment to Partner and Moral Commitment factors. Two bilingual psychologists translated the relevant 30 items to Hebrew using the back-translation technique. Participants were asked to think about their current romantic relationship and to rate the extent to which each of the items was descriptive of their feelings and cognitions in such a relationship. These ratings were made on a 5-point scale ranging from *not at all* (1) to *very much* (5). Because most of the participants were not married, the wording of the moral commitment items was changed. We used the phrase *romantic relationship* instead of the word *marriage* and the word *separation* instead of the word *divorce*. Cronbach alpha coefficients for the two factors were high (.82 for Commitment to Partner and .90 for Moral Commitment). On this basis, we computed the two commitment scores by averaging the relevant items of each factor (15 items per factor). Higher scores reflect higher commitment to partner and higher moral commitment. These two scores were not significantly correlated ( $r = .11$ ).

### Results and Discussion

**Mortality salience and relationship commitment.** The data were analyzed in two steps. In the first step, we examined the contribution of the mortality salience manipulation to reports of romantic commitment. Specifically, we conducted one-way analyses of variance (ANOVAs) for mortality salience (mortality salience, neutral, physical pain) on the two commitment scores.

<sup>1</sup> In all the studies, participants were contacted on the university campus. Only participants who were currently involved in a romantic relationship were included in the statistical analyses (around 60% of the participants who volunteered to participate in the study).

<sup>2</sup> In all the studies, the experimenter was blind to the manipulations.

Table 1  
Means and Standard Deviations of Commitment Scores  
According to Experimental Condition (Study 1)

Dependent measure	Experimental condition		
	Mortality salience	Neutral	Physical pain
Commitment to partner			
<i>M</i>	4.18 <sub>a</sub>	3.80 <sub>b</sub>	3.82 <sub>b</sub>
<i>SD</i>	0.54	0.63	0.50
Moral commitment			
<i>M</i>	2.76 <sub>a</sub>	2.66 <sub>a</sub>	2.80 <sub>a</sub>
<i>SD</i>	0.68	0.74	0.74

Note. Means with different subscripts within a row are significantly different at  $p < .05$ . Commitment scores ranged from 1 to 5, with higher scores reflecting higher feelings of relationship commitment.

Table 1 presents means and standard deviations relevant to these analyses.

The ANOVA performed on the Commitment to Partner score yielded a significant effect for mortality salience,  $F(2, 91) = 4.63$ ,  $p < .05$ ,  $\eta^2 = .10$ . Fitting our predictions, a Scheffé post hoc test ( $\alpha = .05$ ) indicated that participants in the mortality salience condition reported higher commitment to their romantic partner than did participants in the neutral and physical pain conditions (see means in Table 1). No significant difference was found between the neutral and physical pain conditions. Interestingly, the effect for mortality salience was not significant in the ANOVA performed on Moral Commitment,  $F(2, 91) = 0.31$ , *ns*,  $\eta^2 = .003$ . The findings imply that moral commitment was significantly less impacted by the mortality salience induction than was commitment to partner. To directly test this possibility, we made Type of Commitment a within-subject factor and examined whether this variable significantly interacted with mortality salience. Indeed, a two-way ANOVA with one repeated measure factor yielded a significant interaction for mortality salience and type of commitment,  $F(2, 91) = 3.27$ ,  $p < .05$ ,  $\eta^2 = .09$ . That is, type of commitment significantly moderated the effects of mortality salience, limiting these effects mainly to commitment to partner.

In the second analytical step, we examined the extent to which gender and neuroticism moderated the observed mortality salience effects on commitment scores. Specifically, we conducted hierarchical regressions for the two commitment scores in which the main effects of mortality salience (a dummy variable contrasting the mortality salience condition with the two control conditions), gender, and neuroticism were introduced in Step 1. The two-way interactions were introduced in Step 2, and the three-way interaction was entered in Step 3. The regression performed on the moral commitment score revealed that all the main effects and interactions were not significant ( $\beta$ s ranged from .06 to .02). In contrast, the regression performed on the commitment to partner score revealed significant main effects for mortality salience,  $\beta = .35$ ,  $t(90) = 3.33$ ,  $p < .01$ , and neuroticism,  $\beta = -.26$ ,  $t(90) = 2.85$ ,  $p < .01$ . The main effect for gender as well as all the interaction effects were not significant. Fitting the ANOVAs findings, the mortality salience induction led to higher reports of commitment to partner. In addition, fitting previous findings (Kurdek, 1997), the regression revealed that the higher a participant's reported neuro-

ticism, the lower his or her reports of commitment to a romantic partner. The lack of significant interactions implied that neither gender nor neuroticism strongly moderated the contribution of mortality salience to romantic commitment.<sup>3</sup>

*The role of global aversive feelings.* The present findings clearly indicate that the mortality salience condition but not the physical pain condition led to heightened reported commitment to partner. However, the claim that this finding reflects the specific effects of death reminders and not the global effects of nonspecific aversive feelings depends on (a) the mortality salience and physical pain conditions being equivalent in level of global aversive feelings and (b) the failure of these feeling to mediate the observed link between mortality salience and commitment to partner. Without assessing aversive feelings in the experimental situation, one cannot rule out the possibility that these feelings mediated the effects of mortality salience on commitment. Moreover, one cannot be sure that the mortality salience and physical pain conditions induced equivalent aversive feelings.

Though participants did not rate the level of aversive feelings following the manipulations, a content analysis of their answers to the open-ended probe of "describe the emotions that the thought of death/physical pain/television arouses in you" could provide relevant information about these feelings. Hence, two undergraduate psychology students, who were blind to the study's goals and manipulations as well as to participants' condition assignment and scores on the Neuroticism and Commitment scales, independently read each participant's answers to the probe (from which any mention of death, physical pain, or TV were deleted to ensure that judges were blind to condition). Then they rated the level of aversive feelings a participant expressed in reaction to the targeted situation. This rating was made on a 7-point scale ranging from *not at all* (1) to *very much* (7). A Pearson correlation between the ratings provided by the two judges was high,  $r(92) = .84$ ,  $p < .01$ , implying adequate interjudge reliability. On this basis, we averaged for each participant the two judge ratings into a single aversive feelings score. It is important to note that this score did not significantly correlate with the length of a participant's answer,  $r(92) = .03$ .

In examining the equivalence between mortality salience and physical pain conditions in global aversive feelings, we conducted a one-way ANOVA examining differences among the three experimental conditions in ratings of aversive feelings. This analysis revealed a significant effect for experimental condition,  $F(2, 91) = 43.78$ ,  $p < .01$ ,  $\eta^2 = .38$ . Scheffé tests revealed that the mortality salience and physical pain conditions aroused higher levels of aversive feelings ( $M = 3.53$ ,  $SD = 1.08$  and  $M = 3.42$ ,  $SD = 0.91$ , respectively) than did the neutral condition ( $M = 1.48$ ,  $SD = 0.93$ ). No significant difference was found between the mortality salience and physical pain conditions (3.53 vs. 3.42). It

<sup>3</sup> We also examined whether marital status (married, single) contributed to commitment scores and moderated the effects of mortality salience on these scores. Regression analyses, in which marital status (a dummy variable contrasting married to single persons) was included as an additional predictor of the two commitment scores, yielded no significant main effect for marital status as well as no significant interaction of this predictor with mortality salience, gender, or neuroticism. Similar results were found in Studies 2 and 3.

is important that the same pattern of difference was found when the length of participants' answers was controlled for,  $F(2, 90) = 44.51, p < .01, \eta^2 = .38$ . This finding strengthens our confidence in the equivalence between mortality salience and physical pain conditions in the relatively high levels of global aversive feelings they aroused.

In examining the possible mediating role of global aversive feelings, we followed previous TMT studies that have attempted to explore the role of these feelings in explaining mortality salience effects (see Greenberg et al., 1997, for a review). Pearson correlations indicated that the rating of global aversive feelings was not significantly associated with the Commitment to Partner score,  $r(92) = .04$ , or the Moral Commitment score,  $r(92) = -.02$ . Moreover, an analysis of covariance examining the effects of the experimental condition on commitment to partner after controlling for ratings of global aversive feelings still revealed the original significant effect of mortality salience,  $F(2, 90) = 5.30, p < .05, \eta^2 = .11$ . Accordingly, a multiple regression including gender, neuroticism, the mortality salience dummy variable, global aversive feelings ratings, and all the interactive effects still revealed a significant effect for mortality salience on commitment to partner,  $\beta = .38, t(88) = 3.62, p < .01$ . The effects of aversive feelings were not significant. Sobel's (1982) test revealed that the contribution of mortality salience to commitment to partner was not significantly mediated by global aversive feelings ( $Z < 1$ ).

The findings replicate previous TMT studies (see Greenberg et al., 1997, for a review) and make unlikely the possibility that aversive feelings mediated mortality salience effects. Specifically, the present findings imply that global aversive feelings did not significantly mediate the link between mortality salience and commitment to partner.

### Conclusions

Overall, the findings support the hypothesized association between death reminders and feelings of romantic commitment. In line with the mortality salience hypothesis, exposing persons to a mortality salience induction led to higher reports of commitment to partner than did exposing persons to physical pain and neutral conditions. This effect was not significantly moderated by individual differences in gender and neuroticism and was not significantly mediated by global aversive feelings. It is also important to note that, although the mortality salience and physical pain conditions were equivalent in the relatively high levels of aversive feelings they aroused, only mortality salience led to heightened commitment to partner. These findings strengthen our confidence in the specificity of the link between death reminders and relationship commitment and allow us to reject the possibility that global aversive feelings explain this link. Finally, we should note that mortality salience had no significant effect on the Moral Commitment score. We deal with this finding in the General Discussion section.

The finding that romantic commitment was affected by death reminders only seems to be at odds with statements of attachment theory that proximity and intimacy serve to protect us from all kinds of anxiety, including fear of intense physical pain (Bowlby, 1969). However, one should recall that attachment theory makes explicit predictions only about the activation of proximity-seeking behaviors in times of need. Although romantic commitment is

closely associated with feelings of closeness, these two relational constructs should be viewed as separated entities. Whereas the activation of proximity-seeking behaviors reflects the adoption of a passive role as a recipient of a partner's support and comfort, romantic commitment seems to reflect the adoption of a more active role by which one feels personally responsible for the maintenance of a relationship over time. Therefore, it is possible that every source of anxiety leads us to search for a partner's closeness and support, but only the fear of personal death may also lead people to be concerned with relationship maintenance. Of course, this is a post hoc speculation, and further research should be conducted examining the effects of different sources of anxiety on specific relational processes.

### Study 2

In Study 2, we examined the effects of thoughts about relationship commitment on the activation of a specific cultural defense (i.e., reactions to social transgressions) following a mortality salience induction. According to TMT, if a psychological mechanism buffers death anxiety, then the activation of this mechanism following mortality salience should satisfy terror management needs and reduce the need to activate other defensive mechanisms (Greenberg et al., 1997). Therefore, if relationship commitment acts as a death-anxiety buffer, one could expect that asking people to think about their commitment to a close relationship would reduce the need to activate other worldview defenses following a mortality salience induction.

In examining this hypothesis, we assessed a well-documented cultural defense—judgments of social transgressors (Florian & Mikulincer, 1997; Rosenblatt, Greenberg, Solomon, Pyszczynski, & Lyon, 1989). In previous studies, mortality salience has been found to lead participants to make more severe judgments of social transgressions and to give more severe punishment to these transgressions (Florian & Mikulincer, 1997; Rosenblatt et al., 1989). This effect was interpreted as an illustration of a person's heightened striving to protect his or her own society and culture from social transgressors following death reminders (Rosenblatt et al., 1989). On this basis, we constructed a  $2 \times 2$  factorial design experiment for relationship commitment thoughts (yes, no) and mortality salience (mortality salience, neutral) and measured judgments of social transgressions. Our main hypothesis was that the activation of thoughts about relationship commitment would act as an anxiety-buffering mechanism and then would weaken the previously observed effects of mortality salience on judgments of social transgressions.

### Method

*Participants.* Sixty undergraduate students (41 women and 19 men, ranging in age from 20 to 40 years,  $Mdn = 23$ ) from Bar-Ilan University participated in the study without any monetary reward. All the participants were currently involved in a serious heterosexual romantic relationship (relationship duration ranged from 1 year to 12 years,  $Mdn = 2$ ). Forty-two percent of the participants were married.

*Materials and procedure.* The study was conducted on an individual basis, and the general instructions and the Neuroticism scale were identical to those given in Study 1. The Cronbach alpha coefficient for the 12 Neuroticism items was .91. On this basis, a total Neuroticism score was computed by averaging the 12 items. On completing the Neuroticism scale

Table 2  
*Samples, Means, and Standard Deviations of Multidimensional Social Transgressions Scale (MSTS) Scores According to Mortality Salience and Romantic Commitment Salience (Study 2)*

Dependent measure	No mortality salience		Mortality salience	
	No romantic commitment ( <i>N</i> = 15)	Romantic commitment ( <i>N</i> = 13)	No romantic commitment ( <i>N</i> = 16)	Romantic commitment ( <i>N</i> = 16)
MSTS total score				
<i>M</i>	4.67 <sub>a</sub>	4.76 <sub>a</sub>	5.84 <sub>b</sub>	4.78 <sub>a</sub>
<i>SD</i>	1.05	0.96	0.83	0.86

*Note.* Means with different subscripts within a row are significantly different at  $p < .05$ . The MSTS total score ranged from 1 to 7, with higher scores reflecting a more severe evaluation of the transgressions.

and a filler social survey, participants were randomly divided into two conditions of mortality salience (mortality salience, neutral) according to the two open-ended questions described in Study 1 (see *Ns* in Table 2). Then, after this procedure, all the participants completed the 19-item filler–distractor scale described in Study 1.

In the next stage, participants in the two mortality salience conditions (yes, no) were randomly divided into two subgroups according to open-ended questions aimed at manipulating the salience of romantic commitment (see *Ns* in Table 2). These questions were similar to those used for making mortality salient (see Study 1). Participants in the romantic commitment salience condition received the following items: “Please briefly describe the emotions that commitment to your romantic partner arouse in you” and “How is your commitment to a partner manifested in your romantic relationship?” Participants in the no commitment salience condition were asked questions about listening to the radio: “Please briefly describe the emotions that the thought of listening to the radio arouses in you” and “What do you think happens to you when you listen to the radio?” In the two conditions, the questionnaire consisted of two items with space provided below each for approximately one paragraph of response. In this way, participants were randomly divided into four conditions, according to a  $2 \times 2$  factorial design for mortality salience (mortality salience, neutral) and romantic commitment salience (yes, no). Statistical analyses revealed that these four conditions did not significantly differ in sociodemographic characteristics (gender, age, relationship duration, marital status) and neuroticism as well as in the length (number of words) of a participant’s answer to the probes.

After this experimental procedure, participants provided their judgments of social transgressions in a shortened version of the Multidimensional Social Transgressions Scale (MSTS; Florian & Mikulincer, 1997). Originally, the scale included 20 vignettes, each built as a brief newspaper report describing (a) the concrete cause of a particular social transgression and (b) the most damaging consequence of the transgression to the victim (see Florian & Mikulincer, 1997, for vignette wording and description of the construction process). The information provided in each vignette was given as an unequivocal fact without any evaluative judgment and without any personality or sociodemographic details of the offender and the victim. Vignettes included various types of frequently committed transgressions that were selected according to the legal taxonomy used by the Israeli Ministry of Justice, such as traffic offense, robbery, burglary, forgery, fraud, and medical malpractice. Vignettes were constructed in such a way that they represented either intrapersonal or interpersonal outcomes from the victim’s perspective. Intrapersonal consequences included physical injuries, mental impairments, or damages to the victim’s ability to fulfill personal projects. Interpersonal consequences included damages to the victim’s social identity or harm to family and friends. The MSTS was found to be a highly reliable and valid measure (Florian & Mikulincer, 1997).

In the present study, we randomly selected 10 MSTS vignettes (5 implying intrapersonal consequences and 5 implying interpersonal consequences). Participants were requested to read each story and to provide two judgments. First, they evaluated the severity of the transgression on a 7-point scale ranging from *not severe at all* (1) to *very severe* (7). Second, they evaluated the severity of the punishment that should be administered to a transgression on a 7-point scale ranging from *very light punishment* (1) to *very heavy punishment* (7). In the present sample, Cronbach alphas for the two ratings across the 10 vignettes were high (.92 for severity ratings and .91 for punishment ratings). On this basis, we computed two scores by averaging each of the two ratings across the 10 vignettes. However, because these two scores were highly correlated,  $r(58) = .61, p < .01$ , we decided to compute a single transgression judgment score by averaging the severity and punishment ratings. Higher scores mean a more severe evaluation of the transgressions.<sup>4</sup>

## Results and Discussion

*Mortality salience, relationship commitment, and judgments of transgressions.* In examining the effects of mortality salience and romantic commitment salience on judgments of social transgressions, we performed a two-way ANOVA for mortality salience (mortality salience, neutral) and romantic commitment salience (low, high) on the total transgression judgment score. This ANOVA yielded significant main effects for mortality salience,  $F(1, 56) = 5.99, p < .05, \eta^2 = .11$ , and romantic commitment salience,  $F(1, 56) = 4.10, p < .05, \eta^2 = .07$ . Fitting previous findings (e.g., Florian & Mikulincer, 1997), participants in the mortality salience condition provided a more severe evaluation of the transgressions ( $M = 5.31$ ) than did those in the neutral condition ( $M = 4.72$ ). In addition, participants in the romantic commitment salience condition provided a less severe evaluation of the transgressions ( $M = 4.77$ ) than did those in the no romantic commitment salience condition ( $M = 5.26$ ). However, these main effects were qualified by a significant interaction,  $F(1, 56) = 5.88, p < .05, \eta^2 = .10$ . Simple Main Effects Tests revealed the following differences: When thoughts about romantic commitment were not elicited (no romantic commitment salience), mortality

<sup>4</sup> Similar findings were found when analyses were separately conducted on severity ratings and punishment ratings. In fact, because of the high correlation between these two scores, the effects of mortality salience and romantic commitment salience on each of these two ratings were not significant after partialing out the other MSTS rating.



salience led to a more severe evaluation of the transgressions than it did in the neutral condition (see Table 2),  $F(1, 56) = 13.17, p < .01$ . However, when romantic commitment was made salient, the effect of mortality salience on severity ratings was not significant,  $F < 1$  (see Table 2). As expected, the arousal of thoughts about romantic commitment weakened the effects of mortality salience on severity ratings.

In examining the possible moderating effects of gender and neuroticism, we conducted a hierarchical regression for the MSTS total score. In the first step of this regression, we examined the main effects for gender, neuroticism, mortality salience, and romantic commitment salience. The two-way interactions were introduced in Step 2, the three-way interactions in Step 3, and the four-way interaction in Step 4. Findings reveal that gender and neuroticism could not explain the effects of mortality salience and romantic commitment salience on the MSTS total score. First, the main effects of gender and neuroticism on the MSTS total scores were not significant ( $\beta_s = .09$  and  $.07$ ). Second, the significant interaction for mortality salience and romantic commitment salience on the MSTS total score observed in the two-way ANOVA was still significant after controlling for gender and neuroticism variations,  $\beta = -.52, t(49) = -2.15, p < .05$ . Third, the interactions for mortality salience and commitment salience with gender, neuroticism, or both, were not significant.

*Mortality salience and feelings of relationship commitment.* Though participants in the romantic commitment salience condition did not rate their level of commitment to a partner or their moral commitment to the relationship—the two factors Adams and Jones (1997) assessed in Study 1—a content analysis of their answers to the two open-ended probes could provide relevant information about feelings of relationship commitment under the mortality salience and neutral conditions. Hence, two independent judges, undergraduate students who were blind to the study's goals and manipulations as well as to participants' condition assignment and scores on the Neuroticism and MSTS scales, independently read participants' answers to the probes in the romantic commitment salience condition. Then, they made two ratings: (a) the extent to which a participant expressed feelings of attraction, trust, and love toward a partner while referring to his or her commitment (Adams & Jones's Commitment to Partner score) and (b) the extent to which a participant expressed a sense of moral–normative obligation or a sense of responsibility for maintaining a relationship (Adams & Jones's Moral Commitment score). The judges were instructed to carefully read Adams and Jones's (1997) article and their scale items before making the ratings on the open-ended probes and to discuss the meaning of each score with the authors. Ratings were made on a 7-point scale ranging from *not at all* (1) to *very much* (7).

Pearson correlations between the ratings provided by the two judges were high,  $r(58) = .81, p < .01$ , for the Commitment to Partner score, and  $r(58) = .72, p < .01$ , for the Moral Commitment score. These high correlations implied adequate interjudge reliability. On this basis, we averaged the judges' ratings for each participant, which were similar in meaning to Adams and Jones's (1997) two commitment scores. It is important to note that these two scores did not significantly correlate with the length of a participant's answer ( $r_s = -.04$  and  $.06$ ).

In examining the effects of mortality salience on the two commitment scores, we computed one-way ANOVAs among partici-

pants in the romantic commitment salience condition ( $N = 29$ ). The analysis for the Commitment to Partner score yielded a significant effect for mortality salience,  $F(1, 27) = 6.34, p < .05, \eta^2 = .18$ , with participants in the mortality salience condition expressing higher feelings of commitment to partner in their answers to the open probes ( $M = 5.22, SD = 1.04$ ) than did participants in the neutral condition ( $M = 4.23, SD = 1.05$ ). The analysis for the Moral Commitment score revealed no significant differences between the mortality salience and neutral conditions ( $M = 2.90$  vs.  $M = 3.12$ ). Replicating findings of Study 1, the present findings imply that moral commitment was significantly less impacted by the mortality salience induction than was commitment to partner. To directly test this possibility, we made Type of Commitment a within-subject factor and examined whether this variable significantly interacted with mortality salience. Indeed, a two-way ANOVA, with one repeated measure factor, yielded a significant interaction for mortality salience and type of commitment,  $F(1, 27) = 6.31, p < .05, \eta^2 = .14$ . That is, type of commitment significantly moderated the effects of mortality salience, limiting these effects mainly to commitment to partner.

It is important that hierarchical regressions for mortality salience, gender, neuroticism, and all the interaction effects on the two commitment scores only revealed a significant main effect for mortality salience on commitment to partner,  $\beta = .24, t(27) = 2.06, p < .05$ . Other main effects and interactions were not significant. The findings replicate the results of Study 1, strengthening our confidence on the robustness of the observed effects of mortality salience on feelings of commitment to a partner.

It is interesting that the two commitment scores were not significantly correlated with the total MSTS score ( $r_s = -.30$  and  $-.18$ ). However, it is important to note that the correlation between the Commitment to Partner score and the MSTS total score approached statistical significance,  $r(27) = -.30, p = .10$ . That is, there was a trend by which the higher a participant's expression of commitment to partner in his or her answers to the open probes, the lower the severity of transgression judgment. This finding is in line with the observed anxiety-buffering effects of making thoughts of romantic commitment salient.

## Conclusions

The findings support the anxiety-buffering function of relationship commitment. In line with our basic hypothesis, asking people to think about romantic commitment reduced the need to react negatively to social transgressors and to judge transgressions in severe terms following a mortality salience induction. As a result, the previously observed effect of death reminders on judgments of social transgressions, which was replicated when no thoughts about romantic commitment were activated, was weakened when participants were asked to think about romantic commitment. It is important that this effect was not significantly moderated by individual differences in gender and neuroticism. In addition, a content analysis of the expressed thoughts about romantic commitment in the commitment salience condition replicated findings of Study 1, strengthening the validity of the observed heightened commitment to partner following a mortality salience induction. However, before generalizing our findings, one should take into account that cultural worldview defense is a broad construct and that judgments of social transgressions are only one specific de-

fense. Additional research should attempt to replicate and extend the effect of thoughts about romantic commitment to the activation of other cultural worldview defenses.

The observed effects of thoughts about romantic commitment resembled those of other terror management mechanisms. For example, McGregor et al. (1998) found that aggressing against a person who attacks one's political affiliation after mortality salience reduces the need to derogate the target (and vice versa). This is similar to our finding that thoughts of romantic commitment significantly reduced negative reactions to social transgressions after mortality salience. However, there is an important difference between McGregor et al.'s (1998) results and our findings. Whereas McGregor et al. (1998) found such effects with regard to the same target, our study demonstrated the ameliorative effects of romantic investment on a seemingly unrelated response. Accordingly, Arndt et al. (1997) found that the activation of terror management mechanisms reduces heightened death-thought accessibility following mortality salience. It is possible that thoughts about romantic commitment may also reduce death-thought accessibility, which, in turn, may explain the deactivation of other worldview defenses. Of course, this is a post hoc explanation, because we collected no data on the accessibility of death-related thoughts. Further research should examine the generalizability of the observed effects of thoughts about romantic commitment across targets and defensive responses, its effects on death-thought accessibility, and the possible mediating role of this accessibility construct.

### Study 3

Study 3 examined the effects of thinking about relationship problems on death-thought accessibility. Following Goldenberg et al.'s (1999) findings, we reasoned that if a psychological mechanism shields individuals from the awareness of their death, threatening the integrity of this mechanism should raise the accessibility of death-related thoughts. Therefore, if relationship commitment acts as a death-anxiety buffer, making salient the possible disruption of such a commitment (thinking about relationship conflicts and problems) would increase the accessibility of death-related thoughts. In examining this hypothesis, we randomly divided participants into three conditions according to the type of thoughts that were made salient. In the problems in romantic relationship condition, participants were asked to think about problems they have experienced in their current romantic relationship. In the control condition, participants were asked to think about a neutral theme (i.e., a TV program). In the academic problems condition, participants were asked to think about problems they have experienced in their academic studies. The academic problems condition was used to control for the possibility that the link between relationship breaking and death-thought accessibility is due to global aversive feelings created by making salient problematic situations rather than to the induction of thoughts about problems in romantic relationships. In this way, we tested whether the link between thoughts about problems in a romantic relationship and death-thought accessibility is unique to relationship problems. The dependent variable was the accessibility of death-related thoughts, as measured in a Hebrew version of Greenberg et al.'s (1994) word completion task.

### Method

**Participants.** One hundred undergraduate students (55 women and 45 men, ranging in age from 19 to 38 years,  $Mdn = 24$ ) from Bar-Ilan University participated in the study without any monetary reward. All the participants were currently involved in a serious heterosexual romantic relationship (relationship duration ranged from 1 year to 10 years,  $Mdn = 2$ ). Fifty-one percent of the participants were married.

**Materials and procedure.** The study was conducted on an individual basis, and the general instructions and the Neuroticism scale were identical to those given in Study 1. The Cronbach alpha coefficient for the 12 Neuroticism items was .91.

On completing the Neuroticism scale, participants were randomly divided into three conditions according to two open-ended questions. These questions were similar to those used to manipulate mortality salience (see Study 1). Participants in the problems in romantic relationship condition ( $N = 33$ ) received the following items: "Please briefly describe problems you have experienced in your current romantic relationship" and "Describe the emotions that the thought about these problems arouses in you." Participants in the academic problems condition ( $N = 34$ ) received the following items: "Please briefly describe problems you have experienced in your academic studies" and "Describe the emotions that the thought about these problems arouses in you." Participants in the control condition ( $N = 33$ ) were asked questions about watching television: "Please briefly describe the emotions that the thought of watching television arouses in you" and "What do you think happens to you when you watch television?" In the three conditions, the questionnaire consisted of two items with space provided below each for approximately one paragraph of response. Statistical analyses revealed that the three conditions did not significantly differ in sociodemographic characteristics (gender, age, relationship duration, marital status) and neuroticism as well as in the length (number of words) of a participant's answer to the probes.

In the next stage, the accessibility of death-related thoughts was assessed by a Hebrew version of the word completion task, which has been constructed in English by Greenberg et al. (1994) and successfully used in Hebrew by Mikulincer and Florian (2000) on an Israeli sample. In our study, the task consisted of 19 Hebrew word fragments that participants were asked to complete with the first word that came to mind by filling in one missing letter. Eight of the 19 Hebrew fragments could be completed with either neutral or death-related Hebrew words. For example, participants saw the Hebrew fragment *\_VEL* and could complete it with the Hebrew word *HVEL* (*cord*) or with the death-related word *EVEL* (*mourning*). The possible death-related words were the Hebrew words for *death*, *mourning*, *cadaver*, *grave*, *killing*, *dying*, *grief*, and *skeleton*.<sup>5</sup> The dependent measure was the number of death-related Hebrew words with which a participant completed the fragments. This score could range from 0 to 8.

### Results and Discussion

**Problems in romantic relationships and death-thought accessibility.** We analyzed the data in two steps. In the first step, we performed a one-way ANOVA on the number of death-related words for the experimental condition. This analysis yielded a significant effect for experimental condition,  $F(2, 97) = 9.45, p < .01, \eta^2 = .17$ . In line with our predictions, participants in the problems in romantic relationship condition displayed higher accessibility of death-related thoughts ( $M = 1.55, SD = 1.13$ ) than did participants in the academic problems condition ( $M = 0.80, SD = 0.98$ ) and the control condition ( $M = 0.53, SD = 0.72$ ). No

<sup>5</sup> Nearly identical findings were obtained when the words *mourning* and *grief*, which have specific connotations to close relationships, were excluded from the computation of the death-thought accessibility score.

significant difference was found between the academic problems and control conditions.

In the second analytical step, we examined the extent to which gender and neuroticism moderated the observed effect of making salient problems in romantic relationships on death-thought accessibility. Specifically, we conducted hierarchical regressions for the number of death-related words in which the main effects of romantic relationship problems (a dummy variable contrasting the romantic relationship condition with the academic problems and control conditions), gender, and neuroticism were introduced in Step 1. The two-way interactions were introduced in Step 2, and the three-way interaction was entered in Step 3. This analysis revealed a significant main effect for salience of romantic relationship problems,  $\beta = .39$ ,  $t(96) = 4.19$ ,  $p < .01$ . The main effects for gender and neuroticism as well as all the interaction effects were not significant ( $\beta$ s ranged from .03 to .14). Fitting the ANOVAs findings, making salient problems in romantic relationships led to higher death-thought accessibility. In addition, the lack of significant interactions implied that gender and neuroticism did not strongly moderate the effects of the salience of relationship problems on death-thought accessibility.

*The role of global aversive feelings.* The present findings clearly indicate that death-thought accessibility was specifically affected by thoughts about relationship problems but not by thoughts about academic problems. This finding may suggest that the observed heightened death-thought accessibility was due to the specific relational threat implied by thoughts about problems in a romantic relationship rather than to the global aversive feelings that these thoughts may have elicited. However, as in Study 1, the validity of this claim depends on (a) the problems in romantic relationships and academic problems conditions being equivalent in level of global aversive feelings and (b) the failure of these feelings to mediate the observed link between salience of romantic relationship problems and death-thought accessibility. To deal with these two issues, we adopted the analytical strategy of Study 1. Specifically, we analyzed the content of participants' answers to the open-ended probe "Describe the emotions that the thought of \_\_\_\_\_ arouses in you" and rated the level of global aversive feelings elicited by the salience of romantic relationship problems, academic problems, or a neutral topic.

Two undergraduate psychology students, who were blind to the study's goals and manipulations as well as to participants' condition assignment and death-thought accessibility scores, independently read each participant's answers to the probe (from which any mention of romantic relationship problems, academic problems, or TV were deleted) and rated the level of aversive feelings he or she expressed in reaction to the targeted situation. This rating was made on a 7-point scale ranging from *not at all* (1) to *very much* (7). A Pearson correlation between the ratings provided by the two judges was high,  $r(98) = .81$ ,  $p < .01$ , implying adequate interjudge reliability. On this basis, we averaged for each participant the two judges' ratings into a single aversive feelings score. It is important to note that this score did not significantly correlate with the length of a participant's answer,  $r(98) = -.01$ .

In examining the equivalence between the problems in romantic relationships and the academic problems conditions in global aversive feelings, we conducted a one-way ANOVA examining differences between the three experimental conditions in ratings of aversive feelings. This analysis revealed a significant effect for

experimental condition,  $F(2, 97) = 16.11$ ,  $p < .01$ ,  $\eta^2 = .24$ . Scheffé tests revealed that the problems in romantic relationship condition ( $M = 2.71$ ,  $SD = 0.92$ ) and the academic problems condition ( $M = 2.78$ ,  $SD = 1.01$ ) aroused higher levels of aversive feelings than did the control condition ( $M = 1.63$ ,  $SD = 0.82$ ). No significant difference was found between the problems in romantic relationships and academic problems (2.71 vs. 2.78). It is important that the same pattern of difference was found when the length of participants' answers was controlled for,  $F(2, 96) = 15.84$ ,  $p < .01$ ,  $\eta^2 = .24$ . This finding strengthens our confidence in the equivalence between problems in romantic relationships and academic problems conditions in the relatively high levels of global aversive feelings they aroused.

In examining the possible mediating role of global aversive feelings, Pearson correlations indicated that the rating of global aversive feelings was not significantly associated with the number of death-related words (death-thought accessibility),  $r(98) = .08$ . Moreover, an analysis of covariance examining the effects of the experimental condition on the number of death-related words after controlling for ratings of global aversive feelings still revealed the original significant effect for salience of romantic relationship problems,  $F(2, 96) = 9.18$ ,  $p < .01$ ,  $\eta^2 = .17$ . Accordingly, a multiple regression including the salience of the romantic relationship problems dummy variable, global aversive feelings ratings, and the interaction between the dummy variable and global aversive feelings as the predictors still revealed a significant effect for salience of romantic relationship problems on the number of death-related words,  $\beta = .39$ ,  $t(95) = 4.09$ ,  $p < .01$ . The effects of global aversive feelings and all the interactive effects were not significant. Sobel's (1982) test revealed that the contribution of salience of romantic relationship problems to death-thought accessibility was not significantly mediated by global aversive feelings ( $Z < 1$ ).

## Conclusions

Overall, the findings supported the anxiety-buffering function of relationship commitment. In line with our hypothesis, making salient the possible disruption of such a commitment (thinking about relationship problems) led to higher accessibility of death-related thoughts than did control conditions. This finding may imply that thinking about relationship problems may in and of itself activate cultural worldview defenses. If thinking about problems in a romantic relationship increases death-thought accessibility, and heightened death-thought accessibility is what drives worldview defenses (e.g., Greenberg et al., 1994), one could argue that thinking about relationship problems should increase worldview defenses. However, although this is a logical conclusion, Schimmel et al. (1999) found that writing about social exclusion does not engender the same defensive responses produced by mortality salience. Further research should systematically examine the possible links between relationship problems, death-thought accessibility, and the consequent activation of worldview defenses.

It is important that although the problems in romantic relationships and academic problems conditions were equivalent in the relatively high levels of aversive feelings they aroused, only when making romantic relationship problems salient did we observe heightened death-thought accessibility. This effect was not significantly moderated by individual differences in gender and neurot-

icism and was not significantly mediated by global aversive feelings. These findings strengthen our confidence in the specificity of the link between salience of relationship problems and death-thought accessibility and allow us to reject the possibility that global aversive feelings explain this link. What is special about relationship problems (vs. academic problems) that heighten death-thought accessibility? In our view, although both the formation of stable couple relationships and academic achievements may be highly valued in Western cultures, it is possible that only close relationships act as a death-anxiety buffer. However, more research is needed to understand the roles that academic achievements may play in self-representations of young adults as well as in terror management processes.

It is important to note that by only comparing a relationship problems condition to academic problems or neutral conditions, we still do not know whether it is thinking about relationship problems or just romantic relationships that has this effect on death-thought accessibility. In this context, Goldenberg et al.'s (1999) findings that thoughts about romantic relationships decreased death-thought accessibility strengthen our confidence that the activation of thought of relationship problems was responsible for the presently observed increase in death-thought accessibility. Of course, further research should attempt to compare the effects of relationship problems against other control conditions. In this context, future studies should attempt to examine whether the present findings are replicated when participants are asked to think about problems in other less committed types of relationships (e.g., work relations). In our view, disrupting committed relationships should produce higher activation of death-related thoughts than should disrupting less committed relationships.

### General Discussion

The present series of studies represents an initial step in integrating two important domains of social psychology: the management of existential threats and the formation and maintenance of close relationships. In bringing together these two domains, the findings may advance our knowledge of the dynamic interplay between psychological defenses and relational processes. First, close relationships seem to have an inoculating power against basic existential threats, allowing individuals to react to these threats by fulfilling their relational strivings and potentialities. Second, it seems that the sense of relationship commitment is shaped not only by perceived relational investments, relational gains, and potential alternatives (Rusbult, 1980) but also by the existential need of denial of death awareness. That is, romantic commitment may depend on contextual and individual-difference factors related to death concerns and may be partially explained by the ways of coping with these concerns. Third, it seems that terror management processes do not only include worldview defenses aimed at protecting the self from thoughts of annihilation but may also promote commitment to significant others and the expansion of the self that close relationships may provide. On this basis, our study extended terror management research to new directions and opened promising avenues for research and theoretical development on the integration of terror management processes and close relationships.

Study 1 reveals that death reminders activate a person's sense of relationship commitment. Specifically, a mortality salience induc-

tion was found to increase self-reports of relationship commitment as compared with physical pain salience and control conditions. Study 2 indicates that the activation of relationship commitment served as an anxiety buffer by reducing the need for subsequent terror management devices following a mortality salience manipulation. Specifically, giving participants the opportunity to think about commitment to their romantic relationship weakened the habitual mortality salience effects on the judgment and punishment of social transgressors. Study 3 shows that asking participants to contemplate problems in their current romantic relationship led to higher death-thought accessibility than did thinking about academic problems or a control condition. This finding implies that reminders of relationship problems may impair the effectiveness of close relationships as an anxiety buffer and thereby enables the overt manifestation of death-related thoughts. Taken together, these findings suggest that both the mortality salience hypothesis and the anxiety-buffer hypothesis are also valid in the context of relationship commitment.

It is important that the three studies consistently found that gender and neuroticism did not significantly moderate the anxiety-buffering function of commitment feelings and thoughts. Although neuroticism was significantly and inversely related to feelings of relationship commitment (Study 1), it did not significantly interact with the experimental manipulations in the three reported studies. These findings support the generalizability of the observed associations between death reminders, relationship commitment, cultural worldview defenses (judgment of social transgressions), and death-thought accessibility across variations in gender and neuroticism. However, the findings demand further research examining the possible moderating effects of other important individual-difference factors, such as attachment style or self-esteem, that are highly relevant to close relationships and terror management (Greenberg et al., 1997; Mikulincer & Florian, 2000). Accordingly, research should also assess other dyadic factors, such as a partner's neuroticism, that may affect a person's sense of relationship commitment.

One important implication of these findings is that close relationships may serve as a fundamental anxiety buffer. Close relationships have already been conceptualized as an effective means of dealing with basic human fears and as a resource for adjustment. The present findings seem to extend these theoretical formulations to the existential fear of death. It seems that close relationships not only protect individuals from concrete and actual threats and dangers but also provide a symbolic shield against the awareness of one's finitude. The results of this series of studies suggest that when people encounter reminders of their own finitude, they are motivated to strengthen their bond with a significant other, who, in turn, may help them to diffuse the sense of threat. However, unlike most other threats, the threat of death is inescapable, and support from close others cannot remove the threat itself. In this case, perhaps, the affirmation of one's importance in others' lives engenders feelings of meaning that render the prospect of death more tolerable. Another related possibility is that reminders of death alter one's relational cognitions. It may be that the momentary realization of one's finitude changes one's perspective and leads to the understanding that, of all other aspects of life, the bonds one has with significant others are ultimately among the most important aspects of life.

The present studies seem to make two additional original contributions to the field of close relationships. First, they emphasize the dynamic interplay between close relationships and other culturally derived defenses against existential threats. Study 2 illustrates that thinking about a romantic relationship makes unnecessary the activation of other defenses, and then it may make the person more tolerant to deviant and different others. Further research should continue this line of research and examine the effects of close relationships on a person's societal attitudes and values. Second, findings of Study 3 emphasize a symbolic equation between threats to relationship maintenance and death concerns. Such an equation could explain why relationship breaking is such a distressful episode and why people may avoid separation from painful relationships. In our view, separation may impair the buffering of death anxiety. If close relationships act as terror management mechanism aimed at mitigating death concerns, separation from a close relationship partner may threaten the integrity of this mechanism and increase death awareness. Further research should examine whether mortality concerns underlie separation distress.

These conclusions should be taken with caution because the present studies are only a first step in examining the terror management function of close relationships. Our theoretical conceptualization of this function of relationships is not limited to a specific type of close relationship or to a specific psychological component of these relationships. However, the three reported studies exclusively focused on romantic relationships as well as on the commitment component of these relationships. Thus, a valid test of our theoretical ideas demands further research attempting to replicate and extend the presently observed findings to other types of close relationships (e.g., friendship) and to other components of these relationships (e.g., satisfaction, love, conflict resolution, attraction). In addition, because of Becker's (1973) contentions about the connection between sex and death in the context of romantic relationships, further research should examine more in-depth the interplay between sex and close relationships in terror management.

When considering the possible contribution of close relationships to terror management processes, several important theoretical issues come forth pertaining to its relationship to previously conceptualized death-anxiety buffers. One may wonder, for instance, whether close relationships are not merely a subcomponent of the cultural worldview and, therefore, may not constitute a distinct concept that is separable from the well-validated cultural worldview defense. There is no argument that close relationships are influenced to a great extent by various cultural mores and norms and that these relationships may even constitute the building blocks of the cultural worldview. Therefore, it is quite likely that the defensive properties of relationship commitment that were revealed in our research overlap to some extent with the cultural worldview defense.

The results of Study 1, however, suggest that perhaps relationship commitment is not merely a cultural mechanism but may also be influenced by motives that are not entirely dependent on culturally cherished values. Specifically, the results indicate that mortality salience led only to an increase in commitment to partner and did not significantly affect the moral component. This finding may suggest that death reminders increase feelings of romantic commitment but do not significantly affect the sense of obligation

or duty to the relationship. However, one should take this conclusion with some caution, because feelings of commitment to a partner may also fit normative social values, such as freedom of choice and agency. Moreover, one should take into account the fact that most of the participants in our sample were in dating relationships and that the use of moral commitment items may be problematic for people who are not married. Future research should attempt to replicate our findings among married persons. They should also attempt to examine situations in which maintaining a relationship is at odds with a culturally valued goal (e.g., career goal) and to examine whether participants may choose to compromise their worldview in favor of maintaining their relationship.

The above analysis calling for a distinction between the culturally derived terror management mechanisms (cultural worldview, self-esteem) and our proposal of close relationships as an additional terror management mechanism is not intended to undermine the importance of the former. On the contrary, the notion of significant close relationships as an important death-anxiety buffer stems from the very basic assumptions underlying TMT—namely, that humans, as other living creatures, are driven by a self-preservation instinct. This position is in line with Bowlby's (1969) conceptualization of the attachment system that provides a psychoevolutionary device to protect the organism from danger and to ensure its survival. Lifton and Olson (1974) held a similar position stating that "We can say that life for the baby means being connected to the source of care and support. Powerful fears and anxiety appear when the child is left alone, separated from the source of nurture. This image of separation is related to an image of death" (p. 46). In fact, Mikulincer and Florian (2000) have demonstrated that among adults, secure attachment style serves as an effective terror management mechanism and that this mechanism may be somewhat independent of cultural worldview defenses. Thus, it appears that the successful development of strong interpersonal bonds may enable the development of inner resources that may serve as a death-anxiety buffer.

Following this reasoning, one may wonder what the TMT approach has to offer over and above attachment theory. According to attachment theory, psychological and physical sources of threats increase the need for proximity to significant others (Bowlby, 1969). This theoretical assumption can account for the findings of Study 1, in which death reminders, one basic source of existential threat, increased feelings of romantic commitment. However, this assumption cannot fully account for (a) why reminders of physical pain, another source of anxiety, failed to increase romantic commitment and (b) why thinking about relationship problems should increase death-thought accessibility. In the discussion of Study 1, we provided a tentative explanation of this finding. However, only a theoretical integration between attachment theory and TMT's basic assumptions can provide a better explanation of the findings. Because of fundamental similarities between attachment theory and TMT, there is much promise for further research integrating these two bodies of knowledge.

Another theoretical possibility that warrants attention is that close relationships may simply be an effective means of advancing a psychologically significant end—self-esteem enhancement. As in the case of the cultural worldview, the present studies do not attempt to rule out this possibility. It is likely that close relationships indeed serve an important role in maintaining self-esteem

and that, in fact, these relationships may serve as a basic setting for people's sense of worth and validation. Further research should examine more in-depth the possible role that self-esteem enhancement may play in the use of close relationships as a defense against the terror of death. In this context, research should examine whether individual differences in self-esteem may moderate the anxiety-buffering function of close relationships. Accordingly, research should examine whether close relationships would still act as a terror management mechanism when investment in these relationships create conflict and discord and may damage self-esteem.

The present investigation adopts the position that close relationships serve an important anxiety-buffering function that is necessary for personal development and growth. However, other theoretical accounts that understand close relationships differently cannot be overlooked. Some theorists have taken a negative approach toward romantic love and consider it to be a desire for yielding and surrender, a negative giving-up (Nietzsche, 1885/1978). Accordingly, Rank (1941) and Becker (1973) viewed romantic love as a disguise and sublimation of the sexual act. Because sex reminds one of his or her physical, animal nature and because the physical aspects of being are related to death, humans have developed symbolic meanings around sex in an attempt to remove it from the threatening physical world to the safe haven of the symbolic, romantic world.

Recently, Goldenberg et al. (1999) have found that neurotic individuals show more aversion toward the physical aspects of sex under mortality salience conditions and that this aversion is mitigated by imbuing sex in a romantic framework. The authors concluded that romantic love is a central mode of death transcendence that functions by elevating the creaturely act of copulation to a higher symbolic level. Therefore, the present findings could be attributed to the sublimation of physical sex. However, whereas Goldenberg et al.'s findings were obtained only with participants who scored high in neuroticism, we found no significant difference between participants high or low in neuroticism. This finding may suggest that whereas physical sex may be particularly threatening to neurotic individuals (e.g., Eysenck, 1971; Loo, 1984), the need for close relationships is a more universal phenomenon. It is quite likely that the need for a close relationship serves additional functions that go beyond the sublimation of physical sex and that may underlie the present findings. Further research should attempt to explore these various functions and their interplay with the sexual system.

Before reaching any firm conclusion, some limitations of this study need to be considered. First, further studies should examine more in-depth the possible role of negative affect when making mortality salient. In the present studies, we introduced other threatening conditions to control for the possible effects of global aversiveness and rated the level of global aversive feelings participants expressed in their answers to the experimental probes. Overall, the results indicate that the observed findings can be attributed to terror management processes rather than to the arousal of nonspecific aversive feelings. However, one should note that we made no independent assessment of negative affect following the manipulations. Further studies should provide more information about the possible association between death reminders and negative affect.

In the present studies, relationship commitment was measured by self-report instruments. Future studies should use other assessment means such as diary studies or observational techniques. Moreover, we conducted this study on Israeli university students, limiting the generalizability of findings in terms of culture, religion, social class, age, and marital status. Future research should extend these findings to other cultural, ethnic, age, and socio-demographic groups. One should note that TMT studies have so far been carried out in Western societies, and one may wonder whether mortality salience effects would apply in other cultures where death is a more integral and accepted part of life and does not necessarily imply the cessation of being. In this context, cross-cultural research could also examine whether the use of relationship commitment as a terror management device would be observed in other cultures where romantic love is not a central component of marriage.

Despite these limitations, we believe that the present studies open promising new directions in the incorporation of close relationships within the TMT framework. The findings also illustrate how terror management processes may promote constructive processes, such as the formation and maintenance of committed relationships. This line of research may reveal the impact of mortality salience on other interpersonal processes and behaviors, such as helping, caring, and providing support to close and distant others.

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