

Being Present in the Face of Existential Threat: The Role of Trait Mindfulness in Reducing Defensive Responses to Mortality Salience

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Terror management theory posits that people tend to respond defensively to reminders of death, including worldview defense, self-esteem striving, and suppression of death thoughts. Seven experiments examined whether trait mindfulness—a disposition characterized by receptive attention to present experience—reduced defensive responses to mortality salience (MS). Under MS, less mindful individuals showed higher worldview defense (Studies 1–3) and self-esteem striving (Study 5), yet more mindful individuals did not defend a constellation of values theoretically associated with mindfulness (Study 4). To explain these findings through proximal defense processes, Study 6 showed that more mindful individuals wrote about their death for a longer period of time, which partially mediated the inverse association between trait mindfulness and worldview defense. Study 7 demonstrated that trait mindfulness predicted less suppression of death thoughts immediately following MS. The discussion highlights the relevance of mindfulness to theories that emphasize the nature of conscious processing in understanding responses to threat.

Keywords: mindfulness, mortality salience, self-determination theory, terror management theory

Death is an inescapable fact of life that, nonetheless, most people avoid contemplating too directly. When mortality is salient, it can arouse experiences varying from distress and anxiety to a sense of urgency and a search for meaning. Although there are various ways to cope with this existential concern (Yalom, 1980), ranging from hopelessness, to denial, to seeking symbolic immortality, it seems clear that the consideration of death affects people intensely, whether or not such contemplation is made consciously. Indeed, work within terror management theory suggests that mortality salience (MS) is a potent motivator of human behavior, even when thoughts of death exist outside of focal attention (Greenberg,

Pyszczynski, Solomon, Simon, & Breus, 1994). According to this framework, people tend to respond defensively to reminders of death, including denial of personal vulnerability to death and suppression of death thoughts, as well as attempts to maintain faith in their cultural worldview and to enhance their self-esteem.

People may differ, however, in their willingness to consider their death and in how defensively they respond to its inevitability. For example, whereas some may experience sadness or anxiety while contemplating their mortality, others may remain open to thinking about death and view it as a source of meaning for life. The present research examined whether more mindful individuals—those who maintain receptive attention to present experience (Brown & Ryan, 2003)—more fully consider their death and are less likely to respond defensively to MS. Before discussing these hypotheses further, however, it is important to provide an overview of the dynamics of terror management, which will offer a theoretical and empirical context into which the proposed role of trait mindfulness as a buffer against existential terror can be placed.

Terror Management Theory

Terror management theory (TMT; Greenberg, Solomon, & Pyszczynski, 1997) assumes that humans, like other animals, have an instinct for self-preservation. Along with this biological imper-

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ative, TMT notes that humans possess the capacities for self-awareness and contemplation of the past and future, and thus can know that one day they will die. Drawing from Becker (1973), TMT posits that the juxtaposition of an instinct for self-preservation with awareness that death is inevitable creates the potential for paralyzing existential terror, which is managed by proximal and distal defense processes (Pyszczynski, Greenberg, & Solomon, 1999).

Proximal Defenses

Death thoughts are often too threatening to be kept in focal attention for an extended time. To remove such thoughts from awareness so as to manage existential terror, people initially respond to MS in rational, threat-focused ways. One type of proximal defense is suppression of death thoughts. Greenberg et al. (1994) found that death-thought accessibility was initially low after MS and then increased over time. Arndt, Greenberg, Solomon, Pyszczynski, and Simon (1997) found that this delayed increase in death thoughts was reversed among those under high cognitive load, suggesting that suppression of death thoughts requires adequate cognitive resources to function. Another type of proximal defense is denial of personal vulnerability to disease and premature death. Greenberg, Arndt, Simon, Pyszczynski, and Solomon (2000) found that immediately after MS, participants biased their self-reported emotionality when that trait was related (either positively or negatively) to early death. Other forms of vulnerability-denial can have beneficial effects on physical health (for a review, see Goldenberg & Arndt, 2008). For example, immediately after MS participants reported increased fitness intentions (Arndt, Schimel, & Goldenberg, 2003) and preferences for sunscreen use (Routledge, Arndt, & Goldenberg, 2004). Yet proximal defenses are only partially effective in managing existential terror because death thoughts remain influential outside of focal attention.

Distal Defenses

Once death thoughts have receded from focal attention, people rely on a dual-component, cultural anxiety buffer, consisting of a cultural worldview and self-esteem, to manage the implicit knowledge of their inevitable death. People create and maintain a system of beliefs and practices (a cultural worldview) that provides order and meaning in life, standards of value to attain, and protection against death in the form of symbolic immortality. If cultural worldviews assuage anxiety when death is a distal concern, then under MS people should defend their belief systems by derogating those who question, oppose, or threaten the cultural worldview. Research from TMT supports this proposition. Rosenblatt, Greenberg, Solomon, Pyszczynski, and Lyon (1989) found that participants under MS showed more negative reactions toward moral transgressors (prostitutes) than those not under MS. Worldview defense following MS has been observed in biased favoritism toward foreigners who validate the cultural worldview (Greenberg et al., 1994), biased favoritism toward racists who are the same race as study participants (Greenberg, Schimel, Martens, Solomon, & Pyszczynski, 2001), and aggression toward those who violate the cultural worldview (McGregor et al., 1998).

Self-esteem is derived from meeting cultural standards of value and provides protection against existential terror (Harmon-Jones et

al., 1997). If self-esteem buffers anxiety when death is a distal concern, then under MS people should strive to meet cultural standards of value. Research from TMT supports this proposition. Taubman Ben-Ari, Florian, and Mikulincer (1999) found that MS increased risky driving behavior among those who considered their driving ability to be a source of self-esteem. Self-esteem striving has been observed in identification with one's body among those higher in body esteem (Goldenberg, McCoy, Pyszczynski, Greenberg, & Solomon, 2000) and strength output among those who value physical strength (Peters, Greenberg, Williams, & Schneider, 2005).

These and numerous other such findings suggest that under MS, people (a) respond more negatively to those who oppose their beliefs and respond more positively to those who support their values (cultural worldview defense) and (b) strive to meet cultural standards of value (self-esteem striving). Both types of distal defense are used to manage existential terror.

The Role of Consciousness in Terror Management

TMT also draws on psychodynamic theory (Rank, 1936) to argue that many thoughts and behaviors are motivated by unconscious content. Accordingly, the effects of MS are theorized to depend on where death thoughts reside in awareness. Worldview defense is not expected to occur when death thoughts are conscious because people use proximal defenses to temporarily remove the threat, although such defenses do not deal adequately with existential terror. Thus, TMT suggests that the effects of MS are most readily observed when death thoughts are outside of awareness, on the periphery of consciousness, yet highly accessible (Greenberg et al., 1997).

Research from TMT supports this proposition. Greenberg et al. (1994) found that participants given a subtle MS induction showed higher worldview defense than those led to consider their mortality more deeply. The subtle induction likely allowed death thoughts to fade from awareness, whereas the deeper induction focused attention on mortality and kept such thoughts conscious. Arndt, Greenberg, Pyszczynski, and Solomon (1997) found that subliminal death primes led to an immediate increase in worldview defense. Because participants were not aware of the prime, unconscious death thoughts instigated distal, rather than proximal, defense. These findings suggest that keeping death thoughts in focal attention and attending to existential threat may attenuate both proximal and distal defense.

The Concept of Mindfulness

The current studies tested this idea by examining how mindfulness affects responses to MS. Mindfulness has received much attention in contemporary clinical and social psychology given its apparent benefits for behavior regulation, psychological health, and interpersonal relationships (Brown, Ryan, & Creswell, 2007). Mindfulness is an exemplar of the experiential mode of conscious processing (Teasdale, 1999) that concerns a receptive state of mind wherein attention, informed by awareness of present experience, simply observes what is taking place. Trait mindfulness involves a more frequent receptivity to internal and external stimuli as they occur, which contrasts with the conceptually driven mode of processing wherein occurrences are habitually filtered through appraisals, evaluations, and other forms of cognitive manipulation

(Brown & Cordon, 2009). Importantly, mindfulness differs from the two modes of processing described by Epstein (1994)—*experiential processing*, which is preconscious, automatic, and emotion-laden, and *rational processing*, which is logical and relatively affect-free. Our conceptualization of mindfulness is also somewhat distinct from that of Langer (1989) and from Baer, Smith, Hopkins, Krietemeyer, and Toney's (2006) *mindfulness skills*.

Drawing on self-determination theory (Deci & Ryan, 2000; Niemiec, Ryan, & Deci, 2010; Ryan & Deci, 2000), Brown and Ryan (2003) suggested that mindfulness is an important component of healthy self-regulation. In fact, they found that trait mindfulness was positively associated with autonomous self-regulation and congruence between implicit and explicit affect. In threatening situations, the receptive attention that characterizes trait mindfulness is thought to facilitate exposure, or less defensive processing of threat (Baer, 2003), and research suggests that mindfulness promotes desensitization and reduced emotional reactivity (Arch & Craske, 2006), greater tolerance of unpleasant states (Eifert & Heffner, 2003), reduced habitual responding (Wenk-Sormaz, 2005), and more adaptive responding in threatening social situations (Barnes, Brown, Krusemark, Campbell, & Rogge, 2007). Further, mindfulness has been shown to relate positively to self-esteem and negatively to neuroticism (Brown & Ryan, 2003), which have been found to mitigate and enhance worldview defense, respectively (see Greenberg et al., 1997).

This theory and research on mindfulness argues for the value of an observant stance toward experience—that is, a *self-as-knower*—rather than an agent of reflexive cognition in which attention informs thoughts about the self, as in self-awareness theories (Duval & Wicklund, 1972). Indeed, Brown and Ryan (2003) found that trait mindfulness shares little variance with such constructs as private self-consciousness and reflection. Importantly for this investigation, mindfulness does not include a particular set of ideas that constitute a worldview, although those more mindful may endorse as-yet unknown beliefs or attitudes associated with worldviews. In a mindful mode of processing, attention is deployed such that the contents of consciousness—self-relevant thoughts, images, and identities—and overt behaviors are simply on display.

The Proposed Role of Trait Mindfulness in Terror Management

Because mindfulness affords receptive, unbiased processing of threat, we hypothesized that trait mindfulness would moderate defensive responses to MS. There are several reasons for this hypothesized moderation of proximal and distal defense by mindfulness. First, those more mindful may more fully process the MS experience, reflected in longer consideration of their death and less suppression of death thoughts—that is, less proximal defense. This explanation is in accord with mindfulness theory (Brown et al., 2007). Yet there are two alternative explanations for the proposed moderating role of mindfulness. It may be due to the associations between trait mindfulness and both neuroticism and openness to experience, which may predict higher and lower defense, respectively. Also, trait mindfulness has been positively related to self-esteem (Brown & Ryan, 2003), which has been found to moderate the MS effect (Harmon-Jones et al., 1997). Both the theorized and alternative hypotheses were examined in this research.

The Present Research

This research examined the role of trait mindfulness in moderating proximal and distal defense following MS. In three experiments, we tested whether trait mindfulness attenuates worldview defense, operationalized as pro-U.S. bias among American participants (Study 1), pro-White bias among Caucasian participants (Study 2), and harsher judgments of social transgressions (Study 3). To assess whether the findings of Studies 1–3 were due to less defense or simply to different worldview beliefs held by those more mindful, Study 4 examined whether more mindful individuals defend a constellation of values theoretically associated with mindfulness. In Study 5, we examined whether trait mindfulness reduces another form of distal defense—namely, self-esteem striving, operationalized as appeal of physical sex (relative to personal connection) among those higher in trait body esteem. A sixth and seventh experiment were conducted in an effort to explain the lower distal defense found among those more mindful. Specifically, we tested whether trait mindfulness attenuates defense through a more open processing of the MS experience, operationalized in a preliminary way as writing time during the MS induction (Study 6) and more stringently as death-thought accessibility following MS (Study 7). In these experiments, we tested alternative explanations of the hypothesized moderation by mindfulness by controlling for relevant personality and attitudinal constructs and self-esteem.

Study 1

Study 1 examined whether trait mindfulness attenuates the MS effect when encountering opposition to a cultural worldview. Worldview defense was operationalized as pro-U.S. bias—that is, the relative favoritism for a pro-U.S. foreign author versus an anti-U.S. foreign author. We hypothesized a two-way interaction of trait mindfulness with induction condition, such that the effect of MS on pro-U.S. bias would be evident only among those lower in trait mindfulness.

We controlled for constructs related to trait mindfulness to test the specificity of our hypothesis. Among the Big Five personality traits, mindfulness has been related negatively to neuroticism and positively to openness to experience (Brown & Ryan, 2003); both may moderate the MS effect. We also controlled for three operationalizations of self-awareness—private self-consciousness, public self-consciousness, and reflection. We argued that trait mindfulness is distinct from those constructs, and Study 1 sought evidence for this by testing the differential predictive validity of trait mindfulness and reflexive consciousness. This is important because self-awareness is thought to accentuate the effect of MS on worldview defense (Pyszczynski, Greenberg, Solomon, & Hamilton, 1990), whereas we expected trait mindfulness to attenuate this effect.

Method

Participants and procedure. Participants were 64 undergraduates (78% female, 22% male; ages 18–22 years) at the University of Rochester who received extra course credit. Most were Caucasian (67.2%); the rest were Asian (18.8%), African American (3.1%), Hispanic/Latino(a) (7.8%), or other (3.1%). All participants self-identified as U.S. citizens.

Participants, tested in groups of two to seven, were randomly assigned to an induction condition. Following Greenberg, Simon, Pyszczynski, Solomon, and Chatel (1992, Study 2), the experimenter, who was naïve to condition, explained that participants would complete two unrelated studies. Participants were told that the “first study” concerned the relations among personality traits and involved the completion of self-report measures. Among the measures were two open-ended questions adapted from Greenberg et al. (1994) used to induce either MS or television salience. Participants were asked to “Briefly describe the emotions that the thought of [your own death/watching television] arouses in you” and to “Jot down, as specifically as you can, what you think will happen to you physically as you [die/watch television] and once you [are physically dead/have watched television].” This treatment was followed by an assessment of mood, which served as a delay between the induction and the worldview defense outcome.

In the “second study,” participants were told that the experimenter had collected essays written by foreigners who had immigrated to the United States and that the experimenter was interested in how students respond to those essays. The essays were the same as in Greenberg et al. (1992)—one pro-U.S. essay and one anti-U.S. essay, which were counterbalanced for order of presentation. After reading each essay, participants evaluated that essay along two dimensions (evaluation of the author and evaluation of the essay). Three questions assessed participants’ views of the author (liked the author, thought the author was intelligent, thought the author was knowledgeable) and two questions assessed participants’ views of the essay (agreed with the opinion, thought the opinion was valid). Evaluations were made on a 9-point scale from 1 (*not at all*) to 9 (*very much*).

Materials.

Mindfulness. The Mindful Attention Awareness Scale (Brown & Ryan, 2003) assessed trait mindfulness (15 items; e.g., “I find myself preoccupied with the future or the past”; “I find myself doing things without paying attention”). Responses were made on a 6-point scale from 1 (*almost always*) to 6 (*almost never*); higher scores reflected higher trait mindfulness.

Big Five personality traits. The NEO—Five-Factor Inventory (NEO—FFI; Costa & McCrae, 1992) assessed neuroticism (12 items; e.g., “I often feel inferior to others”) and openness to experience (12 items; e.g., “I have a lot of intellectual curiosity”). Responses were made on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

Self-consciousness. The Self-Consciousness Scale (Fenigstein, Scheier, & Buss, 1975) assessed private self-consciousness (nine items; e.g., “I generally pay attention to my inner feelings”) and public self-consciousness (seven items; e.g., “I care a lot about how I present myself to others”). Responses were made on a 4-point scale from 1 (*not at all*) to 4 (*very much*).

Reflection. The Reflection/Rumination Questionnaire (Trapnell & Campbell, 1999) assessed reflection on one’s self (12 items; e.g., “I love exploring my ‘inner’ self”). Responses were made on a 5-point scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

Mood. Subscales of the Positive and Negative Affect Schedule—Expanded Version (PANAS—X; Watson & Clark, 1992) assessed current experiences of fear, sadness, guilt, and hostility. Responses were made on a 7-point scale from 1 (*not at all*) to 7 (*very much*).

Results and Discussion

Table 1 presents descriptive statistics, intercorrelations, and scale reliabilities (α) for the trait measures. Table 2 presents bivariate correlations between those measures and pro-U.S. bias within induction conditions.¹

Following Greenberg et al. (1994), separate composite measures of participants’ views of the pro-U.S. and anti-U.S. authors and essays were computed. To obtain the relative favoritism for the pro-U.S. author, the three anti-U.S. author items ($\alpha = .91$) were subtracted from the three pro-U.S. author items ($\alpha = .76$). To obtain the relative favoritism for the pro-U.S. essay, the two anti-U.S. essay items ($\alpha = .83$) were subtracted from the two pro-U.S. essay items ($\alpha = .88$). As in Greenberg et al., no difference in participants’ relative favoritism for the pro-U.S. essay was found between conditions, $t(62) = 0.59$, *ns*, so this measure is not discussed further.

Hierarchical regression was used to test the hypothesis that less mindful participants would report more pro-U.S. bias under MS. All variables were centered and the interactions were created as product terms (Aiken & West, 1991). Controlling for trait mindfulness and induction condition in Step 1, the two-way interaction was added in Step 2. Results are displayed in Table 3 (Study 1) and Figure 1. This interaction predicted pro-U.S. bias ($\beta = -.30$, $p < .001$). Examining the simple effects, at -1 *SD* on trait mindfulness there was a positive effect of induction condition ($\beta = .55$, $b = 2.37$, $p < .001$), indicating more pro-U.S. bias under MS. At $+1$ *SD* on trait mindfulness this effect was nonsignificant ($\beta = -.05$, $b = -0.22$, *ns*).

We then tested whether the hypothesized moderation would obtain after controlling for neuroticism, openness to experience, and the self-awareness constructs. Preliminary regression models showed that of the various control variable main effects and interactions with induction condition, only the interactions with openness to experience and reflection trended toward significance ($ps < .10$). When those main and interaction effects were included in the model with mindfulness, the interaction of trait mindfulness with induction condition predicting pro-U.S. bias remained significant ($\beta = -.40$, $p < .001$) and had the same direction of effect described above.^{2,3}

These results supported our hypothesis that trait mindfulness attenuates the effect of MS on worldview defense. Although MS, relative to a control condition, prompted pro-U.S. bias, this was found only among participants lower in trait mindfulness; those

¹ In Studies 1–4, 6, and 7, independent samples *t* tests with Bonferroni protection revealed no significant induction condition differences on any of the trait measures, nor any gender or ethnicity differences on the trait, worldview defense (Studies 1–4, 6), or proximal defense (Study 7) measures (all $ps > .05$). In Study 5, no significant induction condition differences were found on the trait measures, but some gender and ethnicity differences were observed and are reported in the Results and Discussion section of Study 5.

² In subsequent studies, we first tested the interactions of induction condition with all control variables; nonsignificant ($p > .10$) interactions were excluded from the final models.

³ We tested other Big Five personality traits (extraversion, agreeableness, conscientiousness; Studies 1 and 5) and self-awareness constructs (social anxiety, rumination; Studies 1–2) as moderators of the MS effect. No significant results were found.

Table 1
Descriptive Statistics, Intercorrelations, and Scale Reliabilities
 (α) for Trait Measures: Study 1

Trait measure	1	2	3	4	5	6
1. Mindfulness	—					
2. Neuroticism	-.34**	—				
3. Openness to experience	.07	-.17	—			
4. Private self-consciousness	-.09	.20	.38**	—		
5. Public self-consciousness	-.21	.34**	-.03	.50***	—	
6. Reflection	-.11	-.16	.70***	.49***	-.06	—
α	.90	.88	.73	.71	.89	.90
<i>M</i>	3.89	2.74	3.51	2.90	2.93	3.38
<i>SD</i>	0.76	0.70	0.52	0.47	0.71	0.78

** $p < .01$. *** $p < .001$.

more mindful did not show worldview defense. Because we assessed preexisting (trait) differences in mindfulness, this effect may have been due to some variable associated with mindfulness, rather than mindfulness itself. However, Study 1 showed that the moderation obtained after testing the main and interaction effects of five relevant constructs previously associated with trait mindfulness and/or worldview defense. Thus, Study 1 provided initial evidence that trait mindfulness represents a unique buffer of cultural worldview defense when mortality is salient.

Study 2

Study 2 examined whether the moderation found in Study 1 would generalize to a different type of worldview defense, namely, judgments of a defendant who was the same (vs. different) race as participants. This study was based on research by Greenberg et al. (2001), in which Caucasians judged the guilt of a defendant who appeared to discriminate racially against an employee in a promotion decision. Greenberg et al. found that under MS, Caucasians were more lenient in judgments of a White racist, relative to a Black racist, compared to Caucasians in a control condition, suggesting that MS prompted race-based worldview defense. We hypothesized a three-way interaction among trait mindfulness, induction condition (MS vs. control), and race of the defendant condition (White vs. Black), such that the effect of MS on pro-White bias would be evident only among Caucasians lower in trait mindfulness.

We sought to rule out several alternative explanations of the moderation of worldview defense by mindfulness. First, we controlled for self-esteem. Harmon-Jones et al. (1997) found that self-esteem attenuated the MS effect, and Brown and Ryan (2003) found that mindfulness related positively to self-esteem. It is important to determine that the moderation by mindfulness is not due to shared variance with self-esteem. Second, we controlled for nationalism and political attitudes. Greenberg et al. (1992) found that MS prompted intolerance of dissimilar others among conservatives but not among liberals and that a tolerance prime counteracted the effect of MS on negative reactions to dissimilar others. Together, these findings suggest that nationalism and/or political attitudes may influence defensive responses to MS. Also, the results of Study 1 suggested that more mindful individuals may

have more liberal and tolerant beliefs of dissimilar others. Because Study 2 examined race-based judgments, it was important to determine that the moderation of worldview defense by mindfulness obtains after controlling for nationalism and political attitudes. Third, we compared MS to a dental pain condition to control for aversive or frightening thoughts associated with the MS induction (Greenberg et al., 1994).

Method

Participants and procedure. Participants were 182 undergraduates at George Mason University who received extra course credit. After excluding 70 non-Caucasians, as well as three Caucasians with missing data, data from 109 Caucasian participants (71% female, 29% male; ages 18–38 years) were analyzed.

Participants, tested in groups of three to eight, were randomly assigned to an induction condition. Following Greenberg et al. (2001, Study 3), participants completed questionnaires assessing trait mindfulness and self-esteem and then responded either to the same MS induction as in Study 1 or to parallel questions about dental pain. This treatment was followed by an assessment of mood and the completion of a word search puzzle, which served as a delay between the induction and the worldview defense outcome.

Participants were then randomized to read one of two case files that were “previously evaluated by real judges in a court of law” (Greenberg et al., 2001, p. 122). Each file described race-based occupational discrimination. In one file, the defendant was White and the plaintiff was Black; in the other file, the races of defendant and plaintiff were reversed. All other details of the cases were identical. After reading the file, participants indicated the extent to which the defendant was guilty of discrimination and held racist beliefs on an 11-point scale from 1 (*not at all*) to 11 (*extremely*). Participants were also asked “to take the role of judge” and assign a jail sentence to the defendant from 0 and 36 months. Participants completed measures of nationalism and political attitudes, which were used as controls in predicting judgments of the defendant.

Materials. The mindfulness and mood measures were the same as in the previous study.

Self-esteem. The Rosenberg Self-Esteem Scale (Rosenberg, 1965) assessed self-esteem (10 items; e.g., “I feel that I have a number of good qualities”). Responses were made on a 4-point scale from 1 (*strongly disagree*) to 4 (*strongly agree*).

Nationalism. Participants were asked, “How important to you is your identification as an American?” Responses were made on a 9-point scale from 1 (*not at all*) to 9 (*very important*).

Table 2
Bivariate Correlations Between Trait Measures and Pro-U.S.
Bias: Study 1

Trait measure	MS condition	Control condition
Mindfulness	-.84***	-.36*
Neuroticism	-.01	.22
Openness to experience	.03	-.55***
Private self-consciousness	-.04	-.17
Public self-consciousness	.15	.18
Reflection	.11	-.33 [†]

Note. MS = mortality salience.
[†] $p < .10$. * $p < .05$. *** $p < .001$.

Table 3
Final Hierarchical Regression Model Statistics on Prediction of Defense Outcomes: Studies 1–7

Defense outcome	Predictor	Coefficient (β)	F _{change}	ΔR ²
Study 1: Pro-U.S. bias				
Step 1	MAAS	-.63***		
	Induction	.25**	28.61***	.48
Step 2	MAAS × Induction	-.30***	12.08***	.09
Study 2: Pro-White bias				
Step 1	Self-esteem	.18†		
	Nationalism	.08		
	Political attitudes	.08	2.00	.05
Step 2	MAAS	-.02		
	Induction	.02		
	Race	-.18†	1.62	.04
Step 3	MAAS × Induction	.20†		
	MAAS × Race	.05		
	Induction × Race	-.12	1.68†	.04
Step 4	MAAS × Induction × Race	.21*	2.03*	.04
Study 3: Social transgressions				
Step 1	Self-esteem	-.15†		
	Nationalism	.28**		
	Political attitudes	-.03	3.89*	.09
Step 2	MAAS	-.22*		
	Induction	.27***	8.13***	.11
Step 3	MAAS × Induction	-.18*	4.32*	.03
Study 4: Value endorsement				
Step 1	MAAS	.19		
	Induction	-.09	1.36	.04
Step 2	MAAS × Induction	.34**	7.48**	.11
Study 5: Appeal of sex				
Step 1	Gender	-.27***		
	Ethnicity	-.18*		
	Self-esteem	-.15		
	Neuroticism	-.09		
	Extraversion	.22**		
	Openness to experience	.14*		
	Agreeableness	-.32***		
	Conscientiousness	-.08	7.73***	.26
Step 2	MAAS	-.14*		
	Induction	-.04		
	Body esteem	.04	1.52	.02
Step 3	MAAS × Induction	-.16*		
	MAAS × Body esteem	-.11†		
	Induction × Body esteem	-.04	3.47*	.04
Step 4	MAAS × Induction × Body esteem	-.22***	11.80***	.05
Study 6: Pro-U.S. bias				
Step 1	Self-esteem	.05		
	Nationalism	.19†		
	Political attitudes	-.02	1.16	.04
Step 2	MAAS	-.42***		
	Induction	.22*	13.34***	.22
Step 3	MAAS × Induction	-.28**	9.28**	.07
Study 7: Death-thought accessibility				
Step 1	Self-esteem	-.03	0.07	.001
Step 2	MAAS	.02		
	Induction	.18†		
	Time	.00	1.26	.03
Step 3	MAAS × Induction	.01		
	MAAS × Time	-.16†		
	Induction × Time	.04	0.97	.03
Step 4	MAAS × Induction × Time	-.27**	8.29**	.07

Note. MAAS = trait mindfulness as measured by the Mindful Attention Awareness Scale; Induction = induction condition (*control* = 0, *MS* = 1); Race = race of defendant condition (*Black defendant* = -1, *White defendant* = 1); Time = time of assessment condition (*predelay* = 0, *postdelay* = 1).
 † $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

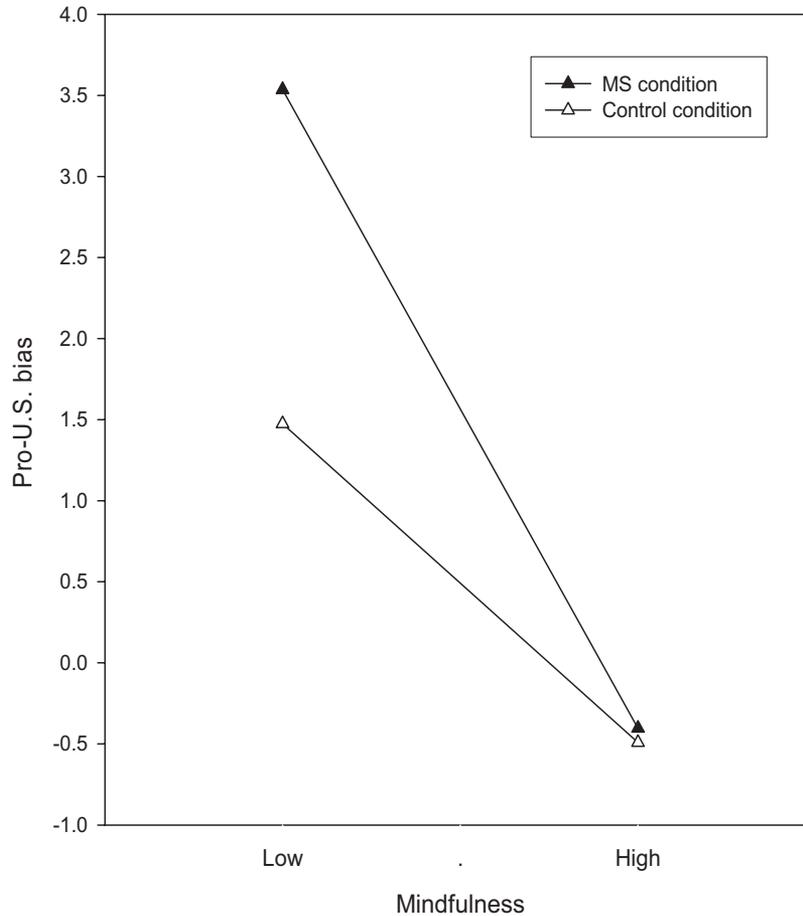


Figure 1. Pro-U.S. bias as a function of trait mindfulness and induction condition in Study 1. MS = mortality salience.

Political attitudes. Political attitudes were assessed using four items. The first three concerned views on foreign policy and economic and social issues (Pratto, Sidanius, Stallworth, & Malle, 1994). Responses were made on a 7-point scale from 1 (*very liberal*) to 7 (*very conservative*). The fourth item asked, “When it comes to politics, where would you place yourself on the following continuum?” (Sargent, 2004). Responses were made on a 7-point scale from 1 (*extremely liberal*) to 7 (*extremely conservative*). The items were highly correlated (*r*s ranged from .50 to .72, all *p*s < .001), so they were combined into a single score.

Results and Discussion

Table 4 presents descriptive statistics, intercorrelations, and scale reliabilities (α) for the trait measures. Table 5 presents bivariate correlations between those measures and judgments of discrimination guilt within induction conditions, according to race of the defendant.

Hierarchical regression was used to test the hypothesis that less mindful Caucasians would report more pro-White bias under MS. The court judgment outcomes were modestly intercorrelated (*r*s ranged from .12, *p* < .22, to *r* = .24, *p* < .01) and were analyzed separately.

First consider ratings of *discrimination guilt*. Controlling for self-esteem, nationalism, and political attitudes in Step 1; trait mindfulness, induction condition, and race of the defendant condition in Step 2; and the three two-way interactions in Step 3; the three-way interaction among trait mindfulness, induction condition, and race of the defendant condition was added in Step 4. Results are displayed in Table 3 (Study 2) and Figure 2. This interaction predicted discrimination guilt (β = .21, *p* < .05).

Table 4
Descriptive Statistics, Intercorrelations, and Scale Reliabilities (α) for Trait Measures: Study 2

Trait measure	1	2	3	4
1. Mindfulness	—			
2. Self-esteem	.41***	—		
3. Nationalism	.04	.17	—	
4. Political attitudes	.03	.05	.36***	—
α	.88	.90	—	.87
<i>M</i>	3.99	3.22	6.61	3.69
<i>SD</i>	0.75	0.53	2.22	1.20

*** *p* < .001.

Table 5
Bivariate Correlations Between Trait Measures and Judgments of Discrimination Guilt by Defendant Race: Study 2

Trait measure	MS condition	Control condition
White defendant		
Mindfulness	.61**	-.15
Self-esteem	.61**	.04
Nationalism	-.11	.00
Political attitudes	-.10	.08
Black defendant		
Mindfulness	-.04	-.06
Self-esteem	.28	-.05
Nationalism	.31	.21
Political attitudes	.29	.21

Note. MS = mortality salience.

** $p < .01$.

Examining the simple effects, at -1 *SD* on trait mindfulness there was a negative effect of induction condition in the White defendant condition ($\beta = -.54$, $b = -1.09$, $p < .01$), indicating more lenient judgments of the White racist under MS. At $+1$ *SD* on trait mindfulness this effect was nonsignificant ($\beta = .28$, $b = 0.57$, *ns*). No significant effects of induction condition emerged for those ± 1 *SD* on trait mindfulness who rated the discrimination guilt of the Black racist (β s = $-.11$ and $-.10$, b s = -0.20 and -0.21 , both $ps > .05$).⁴ Hierarchical models predicting defendant's racist beliefs and jail sentence were constructed in the same way as above; there were no significant three-way interactions (both $ps > .05$).

Greenberg et al. (2001) found that under MS, Caucasians judged a White racist more leniently than a Black racist in a hypothetical court case. Study 2 revealed that this earlier finding was qualified by trait mindfulness. Under MS, Caucasians lower in trait mindfulness evidenced pro-White bias, whereas those more mindful did not. This finding may be attributable to some variable associated with mindfulness, but moderation was found after controlling for constructs thought to be associated with mindfulness and/or worldview defense (self-esteem, nationalism, political attitudes). Notably, moderation was evident on only one of three outcomes, but this parallels Greenberg et al., who found their strongest effects on discrimination guilt. Importantly, the results converged with those of Study 1, and because Study 2 assessed a different type of worldview defense and used additional controls, such findings lend further credibility to the postulate that trait mindfulness reduces defensive responses to MS.

Study 2 showed that the moderation by mindfulness occurred with a type of worldview defense that conceptually paralleled the worldview defense assessed in Study 1. Thus, it is not clear whether the moderation is specific to biased reactions toward those who support or threaten one's worldview, or whether the effect generalizes to other types of defense. Study 3 addressed this question by using a different type of worldview defense.

Study 3

In Study 3, worldview defense was operationalized as judgments of the severity of and recommendations of punishment for social transgressions. Previous research (Florian & Mikulincer, 1997) found that MS prompted harsher judgments of social trans-

gressions, suggesting that under MS people bolster their faith in the cultural worldview by more strongly judging and condemning those whose behavior violates norms associated with that worldview. We hypothesized a two-way interaction of trait mindfulness with induction condition, such that the effect of MS on judgments of social transgressions would be evident only among those lower in trait mindfulness. We again controlled for self-esteem, nationalism, and political attitudes.

Method

Participants and procedure. Participants were 128 undergraduates (77% female, 23% male; ages 18–22 years) at the University of Rochester who received extra course credit. Most were Caucasian (74.2%); the rest were Asian (16.4%), African American (3.1%), Hispanic/Latino(a) (2.3%), or other (3.1%); one did not report ethnicity. All participants self-identified as U.S. citizens.

Participants, tested in groups of one to five, were randomly assigned to an induction condition. The experimenter, who was naïve to condition, explained that participants would complete a study on the relations among personality traits and attitudes in young adults. Among the measures, participants responded to the same open-ended questions used in Study 1 to induce either MS or television salience. This treatment was followed by an assessment of mood, which served as a delay between the induction and the worldview defense outcome.

Materials. The mindfulness, self-esteem, nationalism, and political attitudes measures were the same as in the previous studies.

Mood. The 60-item PANAS-X (Watson & Clark, 1992) assessed current experiences of fear, sadness, guilt, hostility, joviality, and self-assurance. Responses were made on a 7-point scale from 1 (*not at all*) to 7 (*very much*).

Judgments of social transgressions. The Moral Transgressions Scale (Florian & Mikulincer, 1997) presented a series of 10 vignettes that described a unique social transgression. A sample vignette is as follows:

A doctor mixed up the records of two patients with the same last name and amputated the leg of the wrong patient. "It's impossible to believe," said the patient as she stared in disbelief at the empty space on her bed where her left leg was supposed to be. "I came in for a simple knee operation and woke up without a leg."

After each vignette, participants were asked, "How severe was this wrongdoing?" Responses were made on a 15-point scale from 1 (*extremely minor*) to 15 (*one of the worst things a person could do*). Participants were also asked, "How heavily should the perpetrator of this wrongdoing be punished?" Responses were made on a 15-point scale from 1 (*no punishment*) to 15 (*most severe punishment possible*). Two scores were computed as the mean of the 10 severity ratings ($\alpha = .81$) and the mean of the 10 punishment ratings ($\alpha = .86$), which were highly correlated ($r = .85$, $p < .001$) and thus were standardized and combined to form a composite of judgments of social transgressions; higher scores reflected harsher judgments of social transgressions.

⁴ In Studies 2, 3, and 6, we tested whether political attitudes qualified the highest order interactions with trait mindfulness in predicting worldview defense. No significant results were found.

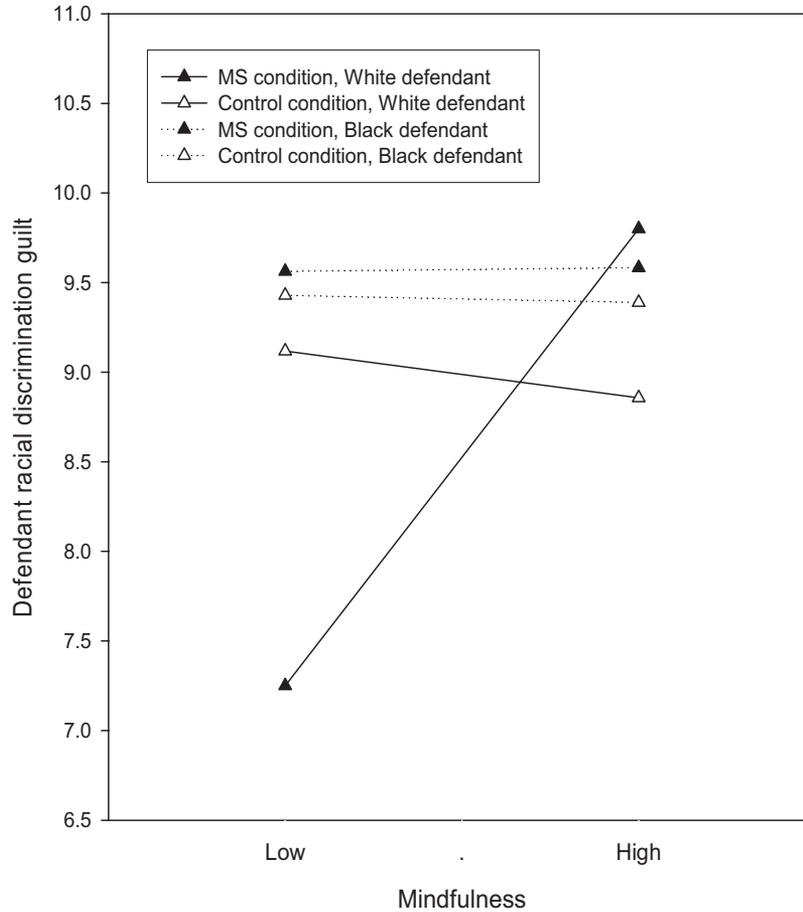


Figure 2. Discrimination guilt as a function of trait mindfulness, induction condition, and race of the defendant condition in Study 2. MS = mortality salience.

Results and Discussion

Table 6 presents descriptive statistics, intercorrelations, and scale reliabilities (α) for the trait measures. Table 7 presents bivariate correlations between those measures and judgments of social transgressions within induction conditions.

Hierarchical regression was used to test the hypothesis that less mindful participants would report harsher judgments of social

transgressions under MS. Controlling for self-esteem, nationalism, and political attitudes in Step 1, and trait mindfulness and induction condition in Step 2, the two-way interaction of trait mindfulness with induction condition was added in Step 3. Results are displayed in Table 3 (Study 3) and Figure 3. This interaction predicted judgments of social transgressions ($\beta = -.18, p < .05$). Examining the simple effects, at $-1 SD$ on trait mindfulness there was a positive effect of induction condition ($\beta = .45, b = 0.86, p < .001$), indicating harsher judgments of social transgressions

Table 6
Descriptive Statistics, Intercorrelations, and Scale Reliabilities (α) for Trait Measures: Study 3

Trait measure	1	2	3	4
1. Mindfulness	—			
2. Self-esteem	.41***	—		
3. Nationalism	-.01	.09	—	
4. Political attitudes	-.06	-.16†	.19*	—
α	.84	.90	—	.81
<i>M</i>	3.92	3.26	6.02	2.98
<i>SD</i>	0.63	0.54	2.06	0.98

† $p < .10$. * $p < .05$. *** $p < .001$.

Table 7
Bivariate Correlations Between Trait Measures and Judgments of Social Transgressions: Study 3

Trait measure	MS condition	Control condition
Mindfulness	-.42***	-.11
Self-esteem	-.09	-.15
Nationalism	.23†	.36**
Political attitudes	.15	-.06

Note. MS = mortality salience.
† $p < .10$. ** $p < .01$. *** $p < .001$.

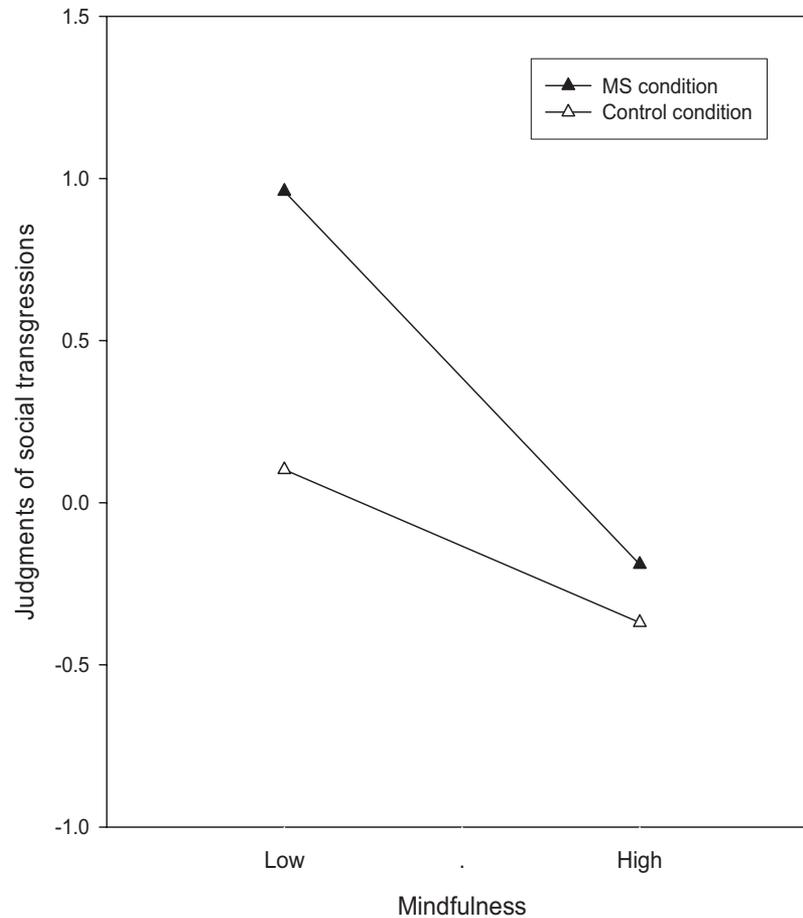


Figure 3. Judgments of social transgressions as a function of trait mindfulness and induction condition in Study 3. MS = mortality salience.

under MS. At +1 *SD* on trait mindfulness this effect was nonsignificant ($\beta = .09$, $b = 0.18$, *ns*).

These results conceptually replicated the moderation by mindfulness observed in Studies 1–2. Importantly, though, Study 3 assessed a type of worldview defense not based on biased favoritism toward those who support one’s worldview, thereby extending the generalizability of the moderation to several types of worldview defense. Specifically, those lower in trait mindfulness made harsher judgments of social transgressions under MS. Although some other variable may account for this result, moderation was observed after controlling for self-esteem, nationalism, and political attitudes, which either have been associated with mindfulness (self-esteem) or are thought to influence worldview defense (all three control variables).

Study 4

Using three measures of worldview defense, Studies 1–3 suggested a lack of defensive responding to MS among those higher in trait mindfulness. These results may have obtained for two reasons. Although we argued in the introduction that mindfulness is a paraconceptual mode of processing that is not defined by psychological features that constitute a worldview, it is possible

that those more mindful have different, as-yet unknown beliefs or attitudes than those less mindful. If this is true, then the outcomes assessed in Studies 1–3 may not have been relevant to the worldviews of those more mindful and perhaps did not afford them an opportunity to respond defensively to MS. A second possibility, which follows from mindfulness theory, is that those more mindful have similar worldviews to those less mindful but respond less defensively to MS.

To test these competing possibilities, Study 4 examined whether more mindful individuals respond defensively to MS by endorsing values theoretically associated with mindfulness. Schwartz (1994) proposed a universal structure of human values that contains an opposition between self-transcendence values (benevolence, universalism) and self-enhancement values (power, achievement, hedonism). Mindfulness is thought to promote greater concern for others (Brown et al., 2007) and has been related to both empathy (Beitel, Ferrer, & Cecero, 2005) and endorsement of intrinsic values (relationships, community involvement) rather than extrinsic values (wealth, fame; Brown & Kasser, 2005), suggesting a relation of mindfulness to self-transcendence (relative to self-enhancement) values. If so, and if those more mindful do respond defensively to MS, then they should endorse self-transcendence

(relative to self-enhancement) values more under MS as an indicator of worldview defense. However, if those more mindful do not respond defensively to MS, then there should be no difference in their value endorsement under MS. On the basis of our conceptualization of mindfulness, we hypothesized a two-way interaction of trait mindfulness with induction condition, such that under MS those more mindful would report no difference in their value endorsement, whereas those less mindful would report less endorsement of self-transcendence (relative to self-enhancement) values.

Method

Participants and procedure. Participants were 65 undergraduates (63% female, 37% male; ages 19–64 years) at the University of Essex who received extra course credit. Most were White British (44.6%); the rest were Arab (43.1%), White European (6.2%), Pakistani (3.1%), Indian (1.5%), or other (1.5%).

Participants, tested individually, were randomly assigned to an induction condition. The experimenter, who was naïve to condition, explained that participants would complete a study on personality and attitudes. Among the measures, participants responded to the same open-ended questions used in Study 2 to induce either MS or dental pain salience. This treatment was followed by a word search puzzle, which served as a delay between the induction and the value endorsement outcome.

Materials. The mindfulness measure was the same as in the previous studies.

Value endorsement. The Schwartz Value Survey (Schwartz, 1992) assessed the importance of the self-transcendence values of benevolence (five items; e.g., “forgiving: willing to pardon others”; $\alpha = .78$) and universalism (eight items; e.g., “equality: equal opportunity for all”; $\alpha = .72$) and the self-enhancement values of power (four items; e.g., “social power: control over others, dominance”; $\alpha = .73$), achievement (four items; e.g., “influential: having an impact on people and events”; $\alpha = .55$), and hedonism (three items; e.g., “self-indulgent: doing pleasant things”; $\alpha = .67$). Responses were made on a 9-point scale from -1 (*opposed to my values*) to 7 (*of supreme importance*). To examine the relative importance of values (cf. Study 1), we subtracted the self-enhancement scores from the self-transcendence scores.

Results and Discussion

Table 8 presents descriptive statistics and scale reliability (α) for mindfulness and bivariate correlations between mindfulness and value endorsement within induction conditions.

Hierarchical regression was used to test the hypothesis that more mindful participants would not report more endorsement of self-transcendence (relative to self-enhancement) values under MS, whereas those less mindful would report less endorsement of such values under MS. Controlling for trait mindfulness and induction condition in Step 1, the two-way interaction was added in Step 2. Results are displayed in Table 3 (Study 4) and Figure 4. This interaction predicted value endorsement ($\beta = .34$, $p < .01$). Examining the simple effects, at -1 *SD* on trait mindfulness there was a negative effect of induction condition ($\beta = -.42$, $b = -3.20$, $p < .05$), indicating less endorsement of self-transcendence (relative to self-enhancement) values under MS. At $+1$ *SD* on trait

Table 8
Descriptive Statistics, Scale Reliability (α), and Bivariate Correlations Between Mindfulness and Value Endorsement: Study 4

Trait measure	MS condition	Control condition	<i>M</i>	<i>SD</i>	α
Mindfulness	.43*	-.26	3.81	0.65	.75

Note. Means, standard deviations, and scale reliabilities are collapsed across study conditions.

* $p < .05$.

mindfulness this effect was nonsignificant ($\beta = .27$, $b = 2.04$, *ns*), indicating no difference in endorsement of such values under MS.

Study 4 was designed as a critical test of our thesis that mindfulness concerns a receptive, nondefensive mode of processing, rather than a worldview. Results showed that those more mindful did not report more endorsement of values consistent with mindfulness (self-transcendence, relative to self-enhancement) under MS, whereas those less mindful reported less endorsement of such values under MS. Thus, those less mindful seemed to become more focused on self-enhancement under MS. As before, this effect could have been due to some other variable associated with mindfulness, but the findings suggested that the moderation observed in Studies 1–3 was not due to the specific types of cultural worldview defense examined. Rather, those more mindful seem to report less worldview defense even when given an opportunity to defend a constellation of values theoretically associated with mindfulness.

Study 5

Studies 1–3 showed that trait mindfulness ameliorated the effect of MS on three types of worldview defense. Study 5 examined whether this moderation would generalize to a related, though distinct, form of defense, namely, self-esteem striving. TMT posits that under MS, people may respond either by bolstering their beliefs that imbue the world with meaning (worldview defense) or by striving to meet cultural standards of value (self-esteem striving), both of which are used to manage existential terror. With the strong emphasis placed on physical attractiveness in contemporary Western culture, it is likely that those who believe they meet cultural standards for their bodies (those higher in body esteem) would respond to MS by finding more appeal in activities that involve their bodies. One activity that is inextricably linked to the body is sex.

Self-esteem striving was operationalized as the appeal of physical sex. Previous research (Goldenberg et al., 2000) found that MS enhanced the appeal of physical sex among those higher in trait body esteem, suggesting that under MS such people derive self-worth from their sexual activities. We maintain that trait mindfulness reduces a variety of defensive responses to MS, and so we hypothesized a three-way interaction among trait mindfulness, induction condition, and trait body esteem, such that the effect of MS on appeal of physical sex among those higher in body esteem would be evident only among those lower in trait mindfulness. We controlled for gender, ethnicity, the Big Five, and global self-esteem, which all may relate to the appeal of sex.

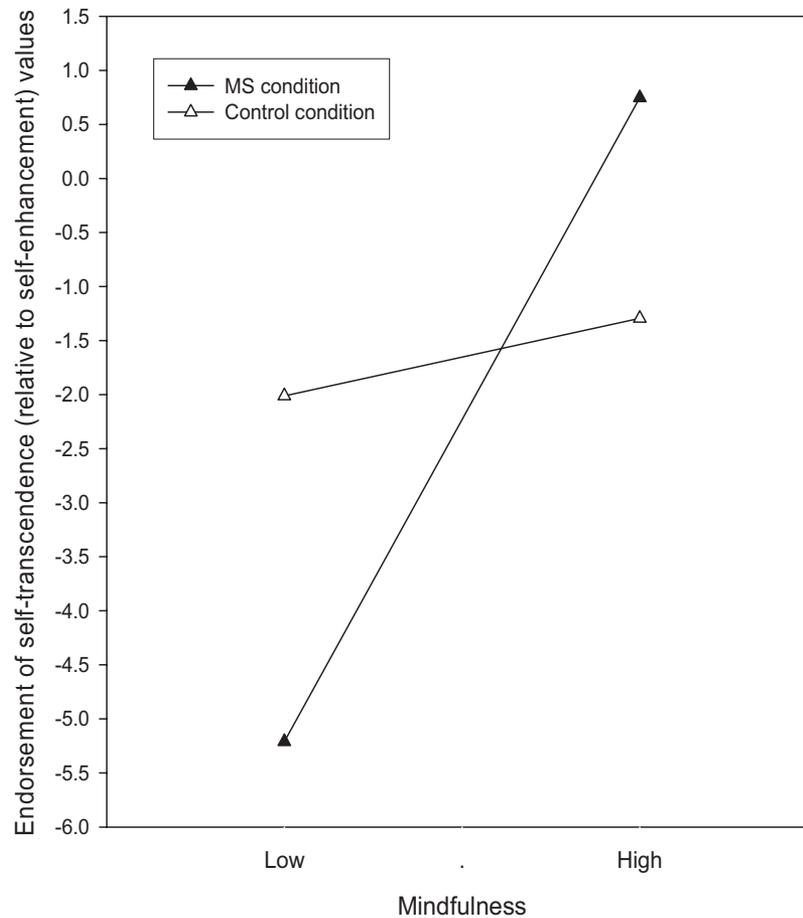


Figure 4. Endorsement of self-transcendence (relative to self-enhancement) values as a function of trait mindfulness and induction condition in Study 4. MS = mortality salience.

Method

Participants and procedure. Participants were 216 undergraduates (73% female, 27% male; ages 18–36 years) at the University of Rochester who received extra course credit. Most were Caucasian (62%); the rest were Asian (21.3%), African American (6.5%), Hispanic/Latino(a) (6.0%), or other (2.8%); three did not report ethnicity.

Participants, tested in groups of one to five, were randomly assigned to an induction condition. The experimenter, who was naïve to condition, explained that participants would complete a study on personality development and emotions in young adults. Among the measures, participants responded to the same open-ended questions used in Studies 1 and 3 to induce either MS or television salience. This treatment was followed by an assessment of mood, which served as a delay between the induction and the self-esteem striving outcome.

Materials. The mindfulness, global self-esteem, Big Five, and mood measures were the same as in the previous studies.

Body esteem. The Body-Esteem Scale (Franzoi & Shields, 1984) assessed feelings toward different parts of one's body (35 items; e.g., buttocks). Responses were made on a 5-point scale

from 1 (*have strong negative feelings about*) to 5 (*have strong positive feelings about*).

Appeal of sex. The Appeal of Physical Sex Questionnaire (Goldenberg et al., 2000) assessed the appeal of physical sex (10 items; e.g., "having an orgasm"; $\alpha = .89$) and personal connection (10 items; e.g., "the emotional connection"; $\alpha = .93$). Responses were made on a 7-point scale from 1 (*not at all appealing*) to 7 (*extremely appealing*). Goldenberg et al. reported analyses only on the physical sex items because they found a strong ceiling effect on the personal connection items that precluded detection of effects. To examine the relative appeal of sex (cf. Studies 1 and 4), we subtracted the personal connection score from the physical sex score.⁵

Results and Discussion

Table 9 presents descriptive statistics, intercorrelations, and scale reliabilities (α) for the trait measures. Table 10 presents

⁵ Although the personal connection items ($M = 5.81$, $SD = 1.02$) were rated as more appealing than the physical sex items ($M = 4.11$, $SD = 1.21$), the appeal of sex composite measure was normally distributed ($M = -1.70$, $SD = 1.25$; skew = .14, $SE = .17$; kurtosis = .70, $SE = .34$).

Table 9
Descriptive Statistics, Intercorrelations, and Scale Reliabilities (α) for Trait Measures: Study 5

Trait measure	1	2	3	4	5	6	7	8	9
1. Mindfulness	—								
2. Body esteem	.12 [†]	—							
3. Self-esteem	.32***	.48***	—						
4. Neuroticism	-.32***	-.44***	-.74***	—					
5. Extraversion	.18**	.36***	.50***	-.51***	—				
6. Openness to experience	-.02	.03	.00	-.02	.09	—			
7. Agreeableness	.34***	.15*	.33***	-.37***	.42***	.13 [†]	—		
8. Conscientiousness	.31***	.21**	.36***	-.34***	.37***	-.08	.41***	—	
9. Gender	.00	-.20**	-.07	.08	.02	-.04	.15*	.17*	—
α	.82	.91	.91	.87	.81	.76	.80	.86	—
<i>M</i>	3.89	3.17	3.19	1.83	2.53	2.56	2.77	2.63	1.73
<i>SD</i>	0.63	0.49	0.56	0.75	0.58	0.56	0.57	0.62	0.46

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

bivariate correlations between those measures and appeal of physical sex (relative to personal connection) within induction conditions.

Independent samples *t* tests with Bonferroni protection revealed several differences on the trait measures and self-esteem striving. Men scored higher than women on body esteem ($M = 3.34, SD = 0.48$ vs. $M = 3.11, SD = 0.48$), $t(210) = 3.06, p < .01$, and appeal of physical sex (relative to personal connection; $M = -1.03, SD = 1.22$ vs. $M = -1.94, SD = 1.18$), $t(198) = 4.76, p < .001$. Caucasians scored higher than those of all other ethnicities on extraversion ($M = 2.62, SD = 0.62$ vs. $M = 2.35, SD = 0.47$), $t(209) = 3.38, p < .001$, and openness to experience ($M = 2.66, SD = 0.53$ vs. $M = 2.38, SD = 0.56$), $t(207) = 3.71, p < .001$. We controlled for gender and ethnicity in the primary analyses.

Hierarchical regression was used to test the hypothesis that less mindful participants higher in trait body esteem would report more appeal of physical sex (relative to personal connection) under MS. Controlling for gender, ethnicity, global self-esteem, and the Big Five personality traits in Step 1; trait mindfulness, induction condition, and trait body esteem in Step 2; and the three two-way interactions in Step 3; the three-way interaction among trait mindfulness, induction condition, and trait body esteem was added in Step 4. Results are displayed in Table 3 (Study 5) and Figure 5. This interaction predicted appeal of physical sex ($\beta = -.22, p <$

.001). Examining the simple effects, at +1 *SD* on trait body esteem and -1 *SD* on trait mindfulness there was a positive effect of induction condition ($\beta = .33, b = 0.79, p < .05$), indicating more appeal of physical sex under MS. At +1 *SD* on trait body esteem and +1 *SD* on trait mindfulness there was a negative effect of induction condition ($\beta = -.44, b = -1.07, p < .001$), indicating less appeal of physical sex under MS. No significant effects of induction condition emerged at -1 *SD* on trait body esteem ($\beta_s = -.07$ and $.14, b_s = -0.17$ and 0.33 , both $p_s > .05$).

Goldenberg et al. (2000) found that under MS those higher in trait body esteem reported more appeal of physical sex. The results of Study 5 supported our hypothesis that this finding would be qualified by trait mindfulness. Under MS, participants higher in trait body esteem but lower in trait mindfulness reported more appeal of physical sex (relative to personal connection) compared to those in a control condition, whereas participants higher in both trait body esteem and trait mindfulness reported less appeal of physical sex (relative to personal connection) under MS than in a control condition. This moderation was observed after controlling for gender, ethnicity, global self-esteem, and the Big Five personality traits, although, as with all traits, it is possible that the moderation was due to some other variable associated with mindfulness.

An important strength of this study was that the moderation by mindfulness was shown to generalize beyond worldview defense to another form of defense, namely self-esteem striving. Interestingly, in the previous studies mindfulness eliminated defensive responses to MS, whereas in Study 5 mindfulness reversed the MS effect, as those more mindful and higher in body esteem reported less appeal of physical sex (relative to personal connection) under MS. It seems that mindfulness may “redirect” how people manage existential terror. However, we do not interpret this as evidence for defensive responding among those more mindful, for two reasons. First, the defensive response to MS among those higher in body esteem is to report more, rather than less, appeal of physical sex (Goldenberg et al., 2000). Second, if those more mindful do respond defensively to MS by reporting less appeal of physical sex, then we would expect a similar pattern among those more mindful and lower in body esteem, which we did not observe. Additional research is needed to elucidate how trait mindfulness affects self-esteem striving.

Table 10
Bivariate Correlations Between Trait Measures and Appeal of Sex: Study 5

Trait measure	MS condition	Control condition
Mindfulness	-.38***	.01
Body esteem	.13	.11
Self-esteem	.01	-.06
Neuroticism	.00	-.01
Extraversion	.00	.07
Openness to experience	.17 [†]	.19 [†]
Agreeableness	-.31**	-.25*
Conscientiousness	-.20 [†]	-.22*
Gender	-.29*	-.35***

Note. MS = mortality salience.

[†] $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

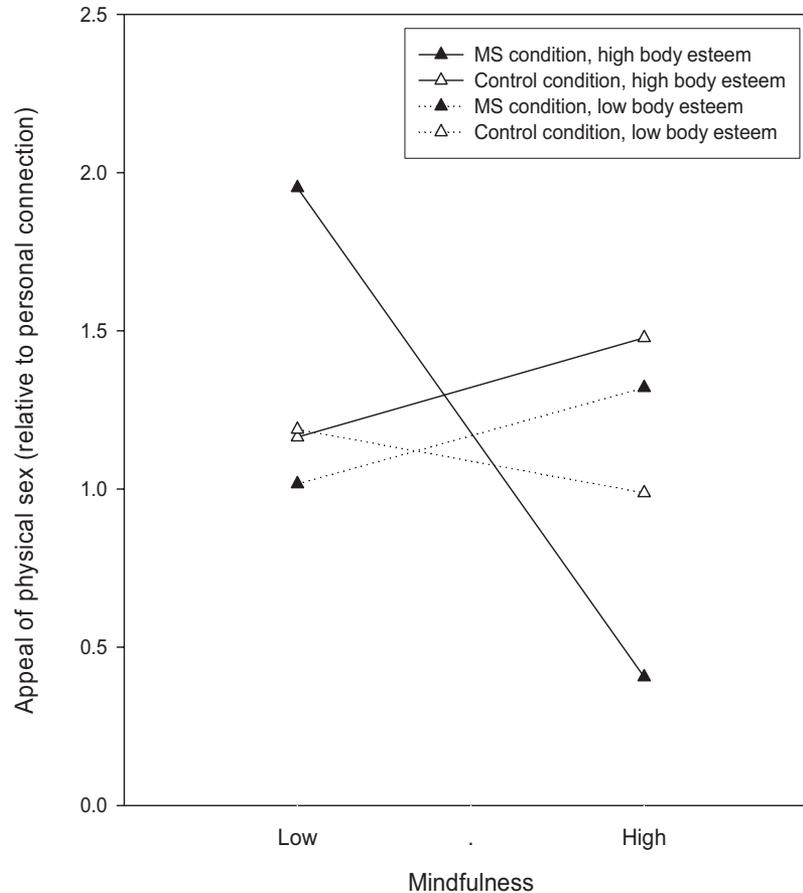


Figure 5. Appeal of physical sex (relative to personal connection) as a function of trait mindfulness, induction condition, and trait body esteem in Study 5. MS = mortality salience.

So far our results have shown that trait mindfulness reduces two forms of defensive responding to MS, namely, worldview defense and self-esteem striving. One criticism that may be leveled at this interpretation is that the four operationalizations of defense (pro-U.S. bias, pro-White bias, judgments of social transgressions, appeal of physical sex) share social-conservative ideological features. Thus, any shared variance of trait mindfulness with such ideology, rather than mindfulness itself, may account for the observed moderation. However, this alternative explanation is allayed by the lack of association between trait mindfulness and political orientation in Studies 2–3 and by the observed moderation after controlling for political attitudes. Most important, in Studies 1–3 those lower in trait mindfulness responded to MS in more socially conservative ways, whereas in Study 5 those lower in trait mindfulness responded to MS in less socially conservative ways. Therefore, it does not seem likely that the results of these studies are due to an association between trait mindfulness and social-conservative ideology.

Study 6

In the introduction, we theorized that because mindfulness affords unbiased processing of threatening information, those more mindful would show less proximal defense, which may explain

their attenuated distal defense. Study 6 was designed as a preliminary investigation of these ideas by examining whether participants higher in trait mindfulness consider their death for a longer time, and whether such consideration helps explain the lower worldview defense evident among those more mindful. We hypothesized that trait mindfulness would predict longer writing time during the MS induction. Because research has shown that mindfulness predicts more receptive processing of a variety of aversive or threatening experiences (Arch & Craske, 2006; Eifert & Hefner, 2003), we hypothesized that trait mindfulness would predict longer writing time during the dental pain induction as well. We controlled for word count to rule out verbosity as an alternative explanation of our results and to focus the analyses on the length of time spent considering the topic of the induction (either personal mortality or dental pain).

Our primary concern, though, was whether a longer consideration of death would help explain the inverse relation of trait mindfulness to worldview defense. Accordingly, we tested a moderated mediation model (Muller, Judd, & Yzerbyt, 2005) with four components representing the relations under study. The first tested whether trait mindfulness would predict lower pro-U.S. bias. The second tested whether trait mindfulness would predict longer writing time in both induction conditions. The third tested whether the

relation of writing time to pro-U.S. bias would be moderated by induction condition, such that longer writing time would predict lower pro-U.S. bias only in the MS condition. The fourth tested whether the interaction of induction condition with writing time would mediate the inverse relation of trait mindfulness to pro-U.S. bias.

To test for moderated mediation, Muller et al. (2005) indicated that there must be a significant relation of the independent variable (trait mindfulness) to the dependent variable (pro-U.S. bias), and the relation of the mediator (writing time) must depend on the moderator (induction condition). That is, either the relation of the independent variable to the mediator is moderated, or the relation of the mediator to the dependent variable is moderated, or both. These guidelines are similar to Baron and Kenny's (1986) causal steps approach for testing mediation; however, Muller et al.'s guidelines also account for variables that change the relations among the independent variable, mediator, and dependent variable. Finally, the relation of the independent variable to the dependent variable must be reduced after controlling for the mediator and its interaction with the moderator. To test the strength of the indirect effect, we compared Sobel's (1982) z statistic to a nonnormal distribution empirically demonstrated to have higher statistical power than the normal z distribution (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002).

Alongside our primary interest in testing for moderated mediation, we sought to replicate the results of Study 1, which was deemed important because the data from that study were collected soon after the U.S. military launched Operation Iraqi Freedom. Arguably, that time was marked by heightened pro-U.S. sentiments and may represent a somewhat unique time in U.S. socio-political history. Data for Study 6 were collected in Spring 2008 and so may present a more normative picture of whether trait mindfulness attenuates pro-U.S. bias under MS. Finally, as in our previous studies, we controlled for self-esteem, nationalism, and political attitudes.

Method

Participants and procedure. Participants were 96 undergraduates (72% female, 28% male; ages 18–23 years) at the University of Rochester who received extra course credit. Most were Caucasian (62.5%); the rest were Asian (20.8%), African American (8.3%), Hispanic/Latino(a) (4.2%), or other (4.2%). All participants self-identified as U.S. citizens.

The procedure was the same as Study 1. Participants, tested in groups of one to five, were randomly assigned to an induction condition (MS vs. dental pain). Research assistants, who were naïve to condition, recorded the time (in seconds) participants spent writing during the induction.

Materials. The mindfulness, self-esteem, nationalism, political attitudes, and mood measures were the same as in the previous studies.

Results and Discussion

Table 11 presents descriptive statistics, intercorrelations, and scale reliabilities (α) for the trait measures and writing time.

Table 11
Descriptive Statistics, Intercorrelations, and Scale Reliabilities (α) for Trait Measures and Writing Time: Study 6

Trait measure	1	2	3	4	5
1. Mindfulness	—				
2. Self-esteem	.41***	—			
3. Nationalism	-.22*	.08	—		
4. Political attitudes	-.13	-.01	.28**	—	
5. Writing time	.28**	-.04	-.07	-.01	—
α	.88	.90	—	.79	—
<i>M</i>	3.84	3.15	5.07	3.03	299.95
<i>SD</i>	0.73	0.55	2.20	1.07	155.50

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

Table 12 presents bivariate correlations between those measures and pro-U.S. bias within induction conditions.

Replication of the moderation of worldview defense by trait mindfulness. Following Greenberg et al. (1994), we computed separate composite measures of participants' views of the pro-U.S. and anti-U.S. authors and essays. To obtain the relative favoritism for the pro-U.S. author, we subtracted the three anti-U.S. author items ($\alpha = .82$) from the three pro-U.S. author items ($\alpha = .75$). To obtain the relative favoritism for the pro-U.S. essay, we subtracted the two anti-U.S. essay items ($\alpha = .92$) from the two pro-U.S. essay items ($\alpha = .89$). As in Greenberg et al., no difference in participants' relative favoritism for the pro-U.S. essay was found between conditions, $t(94) = 1.21$, *ns*, so this measure is not discussed further.

Hierarchical regression was used to test the hypothesis that less mindful participants would report more pro-U.S. bias under MS. Controlling for self-esteem, nationalism, and political attitudes in Step 1, and trait mindfulness and induction condition in Step 2, the two-way interaction of trait mindfulness with induction condition was added in Step 3. Results are displayed in Table 3 (Study 6) and Figure 6. This interaction predicted pro-U.S. bias ($\beta = -.28$, $p < .01$). Examining the simple effects, at -1 *SD* on trait mindfulness there was a positive effect of induction condition ($\beta = .51$, $b = 1.37$, $p < .001$), indicating more pro-U.S. bias under MS. At $+1$ *SD* on trait mindfulness this effect was nonsignificant ($\beta = -.05$, $b = -0.12$, *ns*).

Testing the moderated mediation model. Following Muller et al. (2005), hierarchical regression was used to test each component of our moderated mediation model (see Figure 7). First, controlling for word count ($\beta = .07$, *ns*), those more mindful showed less pro-U.S. bias ($\beta = -.39$, $p < .001$). Second, controlling for word count ($\beta = .61$, $p < .001$), those more mindful wrote for a longer time during the induction ($\beta = .27$, $p < .001$); this was not qualified by induction condition ($\beta = .02$, *ns*). Third, controlling for word count ($\beta = .07$, *ns*) and the relation of trait mindfulness to pro-U.S. bias, the interaction of induction condition with writing time predicted pro-U.S. bias ($\beta = -.19$, $p < .05$). Examining the simple slopes, there was an inverse relation of writing time to pro-U.S. bias in the MS condition ($\beta = -.29$, $b = -0.002$, $p < .05$), whereas in the control condition this relation was nonsignificant ($\beta = .09$, $b = 0.00$, *ns*). Fourth, controlling for the interaction of induction condition with writing time, the relation of trait mindfulness to pro-U.S. bias was reduced from $\beta = -.39$ to

Table 12
Bivariate Correlations Between Trait Measures (and Writing Time) and Pro-U.S. Bias: Study 6

Trait measure	MS condition	Control condition
Mindfulness	-.61***	.01
Self-esteem	.03	.10
Nationalism	.36*	.12
Political attitudes	.05	.03
Writing time	-.36*	.05

Note. MS = mortality salience.

* $p < .05$. *** $p < .001$.

$\beta = -.31$ ($p < .001$). The procedure outlined by MacKinnon et al. (2002) was used to test the significance of the indirect path of trait mindfulness to pro-U.S. bias through the interaction of induction condition with writing time. This indicated that the interaction was a significant partial mediator of the direct relation of trait mindfulness to pro-U.S. bias ($z' = -1.33$, $p < .01$; $P = -4.23$, $p < .01$). These results were essentially unchanged when word count was not controlled.

Study 6 sought to replicate and extend the findings of the previous studies. Those more mindful showed less worldview defense under MS after controlling for self-esteem, nationalism, and political attitudes, although again this effect could be due to some other variable associated with mindfulness. Importantly, Study 6 found evidence for an explanatory mechanism that partially accounted for the inverse relation of trait mindfulness to pro-U.S. bias. Those higher in trait mindfulness wrote for a longer time (controlling for word count) in both induction conditions. We interpret this as a lack of defensive processing by those more mindful, as such participants considered both threatening (personal mortality) and aversive (dental pain) experiences for a longer time. However, we cannot conclude definitively that those more mindful evidenced less proximal defense under MS. Study 6 did not have a condition in which those both higher and lower in mindfulness were expected to write for the same amount of time, so some other difference(s) between those higher and lower in mindfulness (carefulness, thoughtfulness, uncertainty about what to write) may be responsible for the positive relation of trait mindfulness to writing time. The magnitude of reduction of the direct relation of trait mindfulness to pro-U.S. bias by longer writing time under MS was modest but significant, and it was found after controlling for word

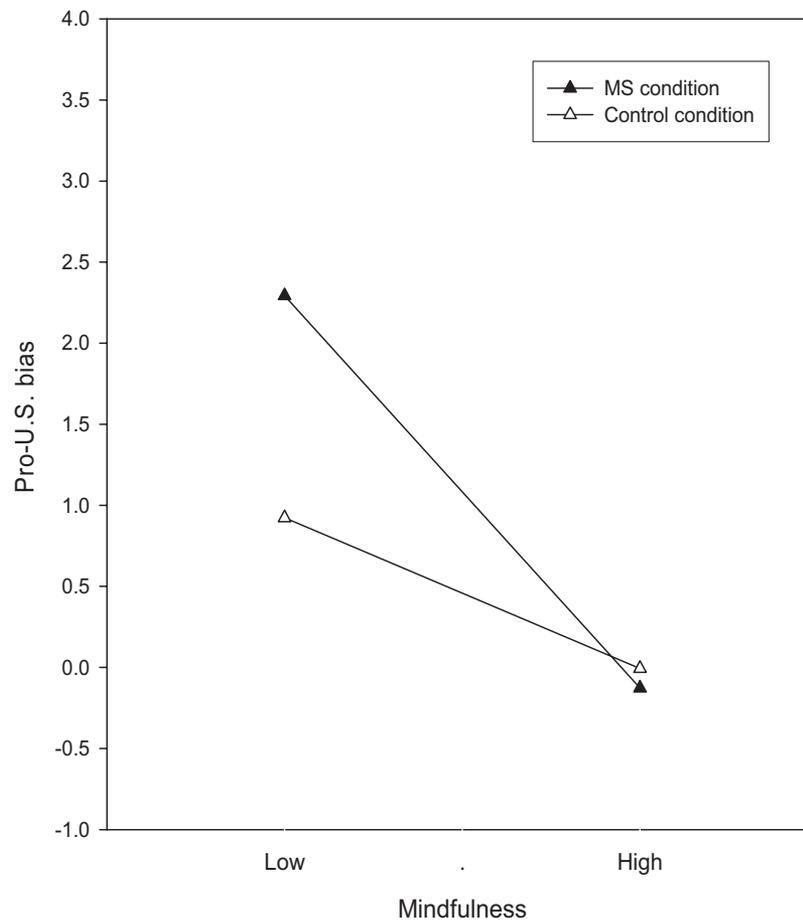


Figure 6. Pro-U.S. bias as a function of trait mindfulness and induction condition in Study 6. MS = mortality salience.

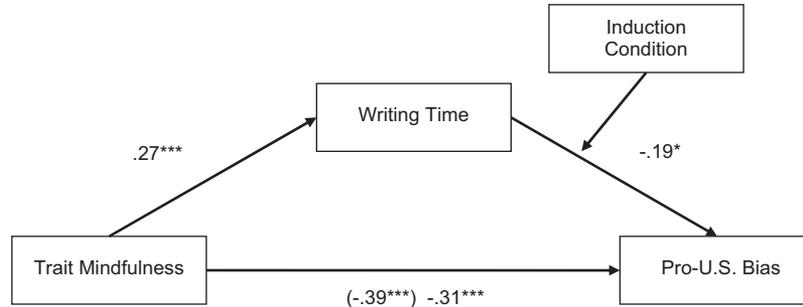


Figure 7. Moderated mediation model to explain the relations among trait mindfulness, writing time, induction condition, and pro-U.S. bias in Study 6. All coefficients are standardized estimates. * $p < .05$. *** $p < .001$.

count (verbosity) as a possible alternative explanation for the results. Given these encouraging findings, we conducted a final study to examine the relation of trait mindfulness to attenuated proximal defense using a more stringent measure of such defense.

Study 7

Studies 1–6 showed that trait mindfulness reduced the MS effect, and Study 6 provided evidence for a potential explanatory mechanism (writing time during MS) for this moderation. Study 7 was designed to examine more closely the relation of trait mindfulness to proximal defense, operationalized as suppression of death thoughts. Recall that death thoughts are typically suppressed immediately following MS (predelay), and then increase over time (postdelay; Greenberg et al., 1994), and that nonconscious, yet highly accessible death thoughts are posited to elicit distal defense (Greenberg et al., 1997). Because trait mindfulness has been inversely associated with thought suppression (Baer et al., 2006), we predicted that the initial suppression of and delayed increase in death thoughts following MS would be attenuated among those more mindful. Thus, we hypothesized a three-way interaction among trait mindfulness, induction condition (MS vs. control), and time of assessment condition (pre- vs. postdelay), such that in the MS/predelay condition there would be a positive relation of trait mindfulness to death-thought accessibility, whereas in the MS/postdelay condition there would be an inverse relation of trait mindfulness to death-thought accessibility. We controlled for self-esteem because it has been associated with death-thought suppression following MS (Harmon-Jones et al., 1997).

Method

Participants and procedure. Participants were 113 undergraduates (81% female, 19% male; ages 18–37 years) at the University of Rochester who received extra course credit. Most were Caucasian (63.3%); the rest were Asian (22.9%), African American (4.6%), Hispanic/Latino(a) (3.7%), or other (5.5%); four did not report ethnicity.

Participants, tested in groups of one to five, were randomly assigned to condition in a 2 (induction condition: MS vs. control) \times 2 (time of assessment condition: predelay vs. postdelay) design. The experimenter, who was naïve to condition, explained that participants would complete a study on personality traits and

attitudes. Among the measures, participants responded to the same open-ended questions used in Studies 1, 3, and 5 to induce either MS or television salience. Then, participants completed a measure of death-thought accessibility either before (predelay) or after (postdelay) several delay/distraction tasks (viz., an assessment of mood, a brief reading with neutral content, and several questions accompanying the reading).

Materials. The mindfulness, self-esteem, and mood measures were the same as in the previous studies.

Death-thought accessibility. To assess death-thought accessibility, participants completed a set of 30 word fragments containing a blank space into which letters could be written (Arndt, Greenberg, Solomon, et al., 1997; Greenberg et al., 1994). Of the 30 word fragments, eight could be completed with either a death-related word or a neutral word. For example, participants saw the word fragment *BUR__D*, which could be completed either as *BURNED* or *BURIED*. The possible death-related words were *dead*, *grave*, *buried*, *coffin*, *skull*, *murder*, *stiff*, and *killed*.

Results and Discussion

Table 13 presents descriptive statistics and scale reliabilities (α) for the trait measures and bivariate correlations between those measures and death-thought accessibility within induction conditions, according to time of assessment. As in the previous studies,

Table 13
Descriptive Statistics, Scale Reliabilities (α), and Bivariate Correlations Between Trait Measures and Death-Thought Accessibility by Time of Assessment: Study 7

Trait measure	MS condition	Control condition	<i>M</i>	<i>SD</i>	α
Predelay					
Mindfulness	.36*	-.12	3.95	0.63	.84
Self-esteem	.01	-.15	3.22	0.52	.88
Postdelay					
Mindfulness	-.49**	.12			
Self-esteem	-.16	.12			

Note. Means, standard deviations, and scale reliabilities are collapsed across study conditions.
* $p < .05$. ** $p < .01$.

trait mindfulness and self-esteem were positively correlated ($r = .35, p < .001$).

Hierarchical regression was used to test the hypothesis that under MS there would be a positive relation of trait mindfulness to death-thought accessibility in the predelay condition, whereas there would be an inverse relation of trait mindfulness to death-thought accessibility in the postdelay condition. Controlling for self-esteem in Step 1; trait mindfulness, induction condition, and time of assessment condition in Step 2; and the three two-way interactions in Step 3; the three-way interaction among trait mindfulness, induction condition, and time of assessment condition was added in Step 4. Results are displayed in Table 3 (Study 7) and Figure 8. This interaction predicted death-thought accessibility ($\beta = -.27, p < .01$). Examined according to time of assessment condition, death-thought accessibility was higher in the MS/postdelay condition than in the MS/predelay condition at $-1 SD$ on trait mindfulness ($\beta = .45, b = 1.19, p < .05$), indicating more suppression of death thoughts in the MS/predelay condition. Death-thought accessibility was higher in the MS/predelay condition than in the MS/postdelay condition at $+1 SD$ on trait mindfulness ($\beta = -.37, b = -0.98, p < .05$), indicating less suppression

of death thoughts in the MS/predelay condition. No significant effects emerged in the control conditions ($\beta_s = -.17$ and $.09, b_s = -0.46$ and 0.23 , both $p_s > .05$). Examining the simple slopes, in the MS/predelay condition there was a positive relation of trait mindfulness to death-thought accessibility ($\beta = .43, b = 0.91, p < .05$), whereas in the MS/postdelay condition there was a negative relation of trait mindfulness to death-thought accessibility ($\beta = -.38, b = -0.81, p < .05$). No significant relations emerged in the control conditions ($\beta_s = -.12$ and $.14, b_s = -0.25$ and 0.29 , both $p_s > .05$).

Building on the preliminary results of Study 6, this study was designed to examine closely the role of trait mindfulness in modulating proximal defense. Greenberg et al. (1994) found that death-thought accessibility was low immediately following MS, which was interpreted as proximal defense to remove death thoughts from focal attention. Active suppression cannot be maintained indefinitely and, accordingly, Greenberg et al. found that death-thought accessibility increased after a delay and distraction. The results of Study 7 supported our hypothesis that this finding would be qualified by trait mindfulness. In the MS/predelay condition those more mindful reported higher death-thought accessibility,

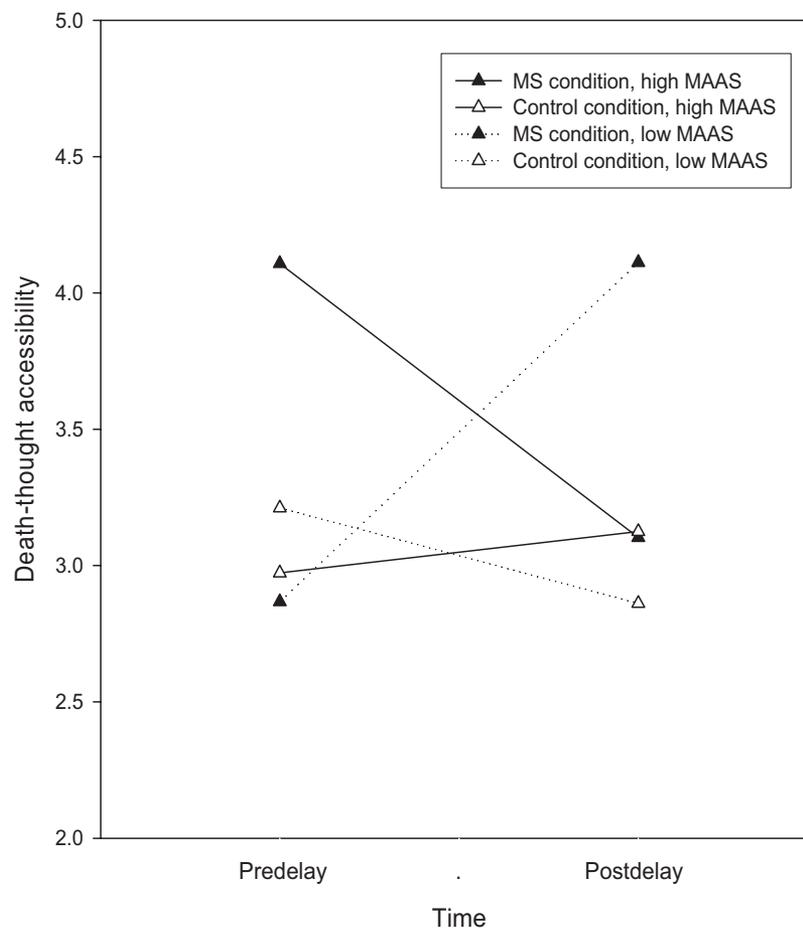


Figure 8. Death-thought accessibility as a function of trait mindfulness, induction condition, and time of assessment condition in Study 7. MS = mortality salience; MAAS = trait mindfulness as measured by the Mindful Attention Awareness Scale.

suggesting lower proximal defense (less suppression of death thoughts) immediately following MS, whereas in the MS/postdelay condition those more mindful reported lower death-thought accessibility. We interpret this latter finding as evidence that death thoughts had been adequately processed. However, it is also possible that this finding reflected delayed suppression of death thoughts among those more mindful. Future research is needed to examine this possibility.

We also examined death-thought accessibility according to time of assessment. Among those lower in trait mindfulness, death-thought accessibility was higher in the MS/postdelay condition than in the MS/predelay condition. Among those higher in trait mindfulness, death-thought accessibility was higher in the MS/predelay condition than in the MS/postdelay condition. Thus, the typical, defensive pattern of death-thought accessibility following MS was evident only among those lower in trait mindfulness and was observed after controlling for self-esteem, although there may be some other variable associated with trait mindfulness that could account for the findings reported in this study.

General Discussion

If all of us would make an all-out effort to contemplate our own death, to deal with our anxieties surrounding the concept of our death . . . perhaps there could be less destructiveness around us. (Kübler-Ross, 1969, p. 27)

TMT offers a framework for explaining how existential threat can engender proximal and distal defense responses. Of interest is whether such responses are inevitable. The current studies add to a growing body of research suggesting that defensive responses to MS can be attenuated (Florian, Mikulincer, & Hirschberger, 2001; Harmon-Jones et al., 1997). These seven studies are the first known to us to examine the role of mindfulness in terror management processes, and the results suggest that trait mindfulness reduces the MS effect on proximal and distal defense. Because mindfulness concerns a particular mode of conscious processing, it has direct relevance for TMT and other theories that accord such processing a central place in understanding individual differences in responses to threat (cf. Brown, Ryan, Creswell, & Niemiec, 2008).

Operationalizing worldview defense in several ways and using a variety of personality, attitudinal, and procedural controls, the first three experiments supported our hypothesis that trait mindfulness attenuates the MS effect. Specifically, less mindful participants under MS showed more pro-U.S. bias (Study 1), more pro-White bias (Study 2), and harsher judgments of social transgressions (Study 3) than those in control conditions. Study 4 showed that the lack of worldview defense among those more mindful was not attributable to their holding a different worldview than those less mindful, as the study revealed that those more mindful did not defend a constellation of values theoretically associated with mindfulness. Study 5 demonstrated that the moderation by mindfulness generalized beyond worldview defense to self-esteem striving.

Two final experiments examined the proximal defense processes through which trait mindfulness may attenuate the MS effect. Study 6 showed that a longer time spent writing during the MS induction accounted for some of the inverse relation of trait

mindfulness to distal defense. Study 7 found that those more mindful evidenced less suppression of death thoughts. Indeed, the typical pattern of death-thought accessibility following MS (initial suppression and delayed increase) was evident only among those less mindful. These studies suggested that those more mindful evidence less proximal defense, which may explain their attenuated distal defense. Of course, we cannot definitively conclude that lower proximal defense mediates the relation of trait mindfulness to distal defense because Study 7 did not assess such defense. There are procedural challenges to assessing distal defense following death-thought accessibility, as it is possible that the latter measure may bring death thoughts to awareness and disrupt the dynamics that facilitate the emergence of distal defense. A close examination of the complete chain of proximal and distal defense processes is needed. Nonetheless, the current studies provided strong support for the hypothesis that trait mindfulness reduces defensive responses to existential threat.

Our studies are not the first to examine an inner resource as a moderator of the MS effect. Florian et al. (2001) found that hardiness (Kobasa, 1982), a resilience factor that attenuates threat appraisal and accentuates challenge appraisal under stress, reduced worldview defense. Hardiness differs from the willing receptivity afforded by mindfulness, but both lines of research suggest that certain psychological strengths can mitigate defensive responses to existential threat.

Our studies complement other research examining whether people necessarily respond defensively to confrontations with death. Cozzolino, Staples, Meyers, and Samboceti (2004), for example, found that materialistic participants who read a deep, concrete *death reflection* scenario evidenced less greed than did those in an MS condition, suggesting that death reflection can attenuate materialism. Lykins, Segerstrom, Averill, Evans, and Kemeny (2007) reported a similar shift away from extrinsic values following direct confrontation with death (surviving an earthquake). Such research suggests that deep contemplation of mortality reduces defensiveness, and our studies point to an individual difference factor that mitigates defensive responses to MS.

Synthesis With Other Theories of Awareness and Defensiveness

TMT posits that self-awareness catalyzes the experience of existential anxiety (Pyszczynski et al., 1990), but there is increasing recognition that the conceptualization and phenomenology of "self-awareness" can be understood in different ways (Brown et al., 2007), with divergent implications for defensive responding (Brown et al., 2008). Unlike reflexive consciousness, in which phenomenal experience and behavior are objects of evaluative, self-relevant attention, personality and clinical theories across a broad spectrum of orientations converge in highlighting the importance of *integrative awareness* (see Brown et al., 2007, for a review). Although variously described within different frameworks, integrative awareness is invariantly characterized by an assimilatory, nondiscriminatory interest in what is occurring both internally and externally and promotes synthesis, organization, and integration in functioning (Ryan, 1995). Integrative awareness involves an openly explorative mode of conscious processing for gathering information, developing insight, and facilitating self-regulation,

social functioning, and psychological wellness (Niemiec, Ryan, & Brown, 2008).

Of particular relevance to the present research, Hodgins and Knee (2002) drew on self-determination theory in proposing a model to examine how conscious experiences relate to defensiveness. They suggested that when people approach situations with a sense of “openness,” which allows for an accurate perception of reality without distortion or avoidance, “individuals have a high tolerance for encountering experience without being threatened or defending against it” (Hodgins & Knee, 2002, pp. 88–89). Openness is similar to mindfulness as described by Brown and Ryan (2003) and others (Kabat-Zinn, 1990). As Hodgins and Knee’s model would predict, the current studies indicated that receptive attention attenuates defensive responding to threat. This research aligns with other work on romantic partner conflict (Barnes et al., 2007), emotional threat (Arch & Craske, 2006), and other ego threats (Hodgins, 2006) in suggesting that, to the extent that people maintain an open, present-centered attention, they respond less defensively when threatened.

Limitations and Future Research

The current studies drew from college populations. It is important for future research to replicate these results among community adults and across cultures. Also, some of the outcomes assessed in these studies had shared ideological features. Several relevant constructs were controlled (nationalism, political attitudes, self-esteem, the Big Five personality traits), but future research examining a broader range of outcomes (e.g., structuring of social information) is needed to test the generalizability of the mindfulness-based attenuation of defense found herein.

Another limitation is that mindfulness was not manipulated in these studies, so the findings may have been due to some other variable(s) associated with mindfulness. Experimental studies of mindfulness enhancement (inductions, interventions) are needed to determine the potential causal role of mindfulness in moderating proximal and distal defense responses. Arch and Craske (2006) found that mindfulness can be heightened for brief periods of time in the laboratory, and there is incipient evidence from research on mindfulness training programs that changes in mindfulness are related to salutary cognitive and emotional changes (Shapiro, Brown, & Biegel, 2007). Research examining the role of trait mindfulness in psychological and behavioral outcomes is more advanced than parallel lines of investigation using experimental approaches, but it is important for future research to replicate the present results using designs that permit causal inferences. Such designs may facilitate efforts to test mediation, as was done herein (Spencer, Zanna, & Fong, 2005). This aside, it is notable that the current studies demonstrated multiple replications of the mindfulness-based attenuation of experimentally induced defense, and several alternative explanations of this moderation were not supported.

The current studies used one measure of trait mindfulness (Brown & Ryan, 2003) that has been a focus of extensive validation efforts. Future research may examine whether other measures of mindfulness (for reviews, see Baer et al., 2006; Brown et al., 2007) yield similar results. It is also important for future research in mindfulness and terror management to extend beyond subjective measures of defense and examine behavioral outcomes (McGregor

et al., 1998). Finally, future research may examine whether mindfulness attenuates defensive responses to subliminal death primes, thereby extending our findings beyond supraliminal MS inductions.

Conclusion

The present research lent empirical support to Kübler-Ross’s (1969) assertion that a receptive consideration of death may reduce interpersonal strife. Defensive responding to MS appears to depend on the extent to which people mindfully consider their own death. These findings are encouraging not only because they point to an inner resource that was found to reduce proximal and distal defense but also because mindfulness can be cultivated (Kabat-Zinn, 1990). Such findings also deepen our understanding of the roles that different modes of conscious processing can play in terror management.

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